UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

RESEARCH VESSEL OPERATORS' COUNCIL

REPORT OF THE

1976 ANNUAL MEETING

HOSTED BY THE
UNIVERSITY OF RHODE ISLAND
NARRAGANSETT, RHODE ISLAND

NOVEMBER 30 - DECEMBER 1, 1976

CONTENTS

SECRETARY:

JAMES GIBBONS
RSMAS, UNIV. OF MIAMI

CHAIRMAN:

JONATHAN LEIBY
WOODS HOLE OCEANO. INSTITUTION

DECEMBER 1976

RESEARCH VESSEL OPERATORS' COUNCIL

October 13, 1976

TO: RVOC Distribution

FROM: Jonathan Leiby, Chairman

SUBJECT: Annual Meeting of the Research Vessel Operator's Council

WHERE: Hosted by the UNIVERSITY OF RHODE ISLAND, the meeting will be held at Sweet Meadows Inn & Motel. The Inn is located on RI Route #108 just past the traffic circle to the EAST of Route US #1.

WHEN: Commencing 0900, November 30th, 1976. Ending mid-afternoon, December 1st.

HOW: Green Airport is the principal airport serving Providence, R.I. It is located South of the city bordering US #1 and Interstate #95 and is about 16 miles from the Oceanography Campus. To proceed South follow I-95 to Route 4 South at Exit #9. This leads into RI Route 2 South which joins US 1 South again at the Wickford traffic circle.

A G E N D A

0900, Tuesday, November 30th, 1976

- Influence of Tonnage Measurement on Research Vessels - Dave Bannerman, URI.
- Progress on the Coastal & Polar R/V Studies.
- Report on CAPE HENLOPEN - Tony Inderbitzen, U. of Del.
- Operating experience with LAURENTIAN - Cliff Tetzloff, U. Mich.
- Lunch at the Inn
- First year's operation of OCEANUS & WECOMA - Jon Leiby and Dick Redmond.
- Status of regulations - Jon Leiby, W.H.O.I.
  - (a) IMCO Meeting on applicability of SOLAS to Research Vessels.

Chairman: Jonathan Leiby, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts 02543
Secretary: James Gibbons, Rosenstiel School of Marine & Atmospheric Sciences, University of Miami, Miami, Florida 33149

University of Alaska • University of California, S. D. • Columbia University • Duke University • Florida State University • University of Hawaii • Johns Hopkins University • University of Miami • University of Michigan • Oregon State University • University of Rhode Island • University of Southern California • Stanford University • University of Texas • Texas A & M University • Virginia Institute of Marine Sciences • University of Washington • University of Wisconsin, Milwaukee • Woods Hole Oceanographic Institution

(b) Load Line Regulations

(c) New Tonnage Convention

(d) Other

. Marine Insurance Study: The Next Step - Bob Elder, NSF/OFS

. Notes on ENDEAVOR - Cliff Buehrens, U.R.I.

. Other Agenda Items as Proposed

. Dinner at the Inn. Cash Bar. Dinner Speaker: Capt. R. P. Dinsmore - Farewell Address.

Wednesday, December 1st

0900 - Short cruise on ENDEAVOR, from Narragansett, R.I.

1130 - Reconvene at Sweet Meadows Inn for Lunch & Any Unfinished Business.

TS:jkm

MINUTES

The 1976 meeting of the Research Vessel Operators' Council was called to order at 0900, by J. Leiby, Chairman, at the Sweet Meadows Inn, Narragansett, R.I.

After a welcome by the Chairman, a short introduction to the University of Rhode Island was presented by C. Buehrens, U.R.I. Marine Superintendent.

The Agenda, having been previously circulated, was adopted. Items were discussed in somewhat different order than that listed, but are detailed here as they appear on the Agenda.

- D. Bannerman read a paper entitled "On The Influence of Tonnage Measurement Upon Research Vessels". A discussion developed on the intricacies of admeasurement.

- Verbal reports were then presented on each of the coastal and polar research vessel studies presently underway, after a short review of the history leading to these grants by R. Dinsmore. S. Toye pointed out new R/Vs are not a "package deal" anymore, but NSF is making use of the tremendous amount of knowledge existing in RVOC membership. Different methods of designing, overseeing the building of, and operation of R/Vs are the order of the day.

1. R. Dinsmore, having recently attended a meeting (Oct.) at M.I.T. reported on the study headed by K.Keays. There are three 125' designs (engines forward, 'midships, and aft) by J. W. Gilbert Associates presently being examined by NECCRF.

2. R. Schelling reported on the Pacific NW group, headed by C. Lorenzen. They engaged Glosten as architect. This model has the following specifications:

   134' overall, 55' beam, 260 gr. tons
   Diesel electric drive: 5 150 KW AC generators
   (parallel-able) forward, motor room aft of that.
   Cruising speed 10 kts., crew = 10, Scientists = 12
   Bow thruster
   A final report has been prepared.

3. J. Thompson spoke on study headed by P. Parker at the U. of Texas. W. Binnings of Gulf Marine Designs has been selected as architect. Some specifications: LOA 95', Beam 25', twin screw, caterpillar engines aft. Speed about 12 kts; crew = 5, Scientists = 12.

4. J. Gibbons, heading U. of Miami studies, reported on two hulls as follows:

   Larger: 126' x 27', 380-400 tons displ.; twin CP screws; central hydraulic system pilot house controls; cr. sp. 12 kts.; 22 persons all told.

Smaller: 94' x 24', twin CP screws, pilot house controls; cr. sp. 10 kts; crew/scientist ratio flexible and is left to operator; 14 bunks all told.

5. J. Leiby reported on the polar R/V study, headed by R. Elsner of U. of Alaska. He mentioned that for really wintering over the vessel would require supplies by air-drop. Her specifications:

LOA 190', 1800 gr. tons, to break 1.5' of ice at 3 kts, being built to ABS ice-strengthened class; twin screw, twin rudders
Power plant: a doubling of the OCEANUS class.
Approx 16 crew and 16 scientists.
With working deck aft, she might cost between $12 - 18 million.

- T. Inderbitzen reported on U. of Delaware's CAPE HENLOPEN, delivered April 4, 1976, to Lewes. She features a 120' x 23' aluminum hull, 178 tons displ., with 18.4 kts. cruising speed. She carries accommodations for 12 scientists and the crew has been increased from 6 to 7, when operating on 24-hr basis. She features pre-packaged meals. Biggest problem still is her CPs which haven't functioned correctly. The K frames have narrow legs (39") and plans are made to correct both deficiencies. Fuel consumption is 95 gals/hr at 16 kts. and 175 gals/hr at 18.5 kts.

- C. Tetzloff said U. of Michigan was generally pleased with LAURENTIAN, operating with a crew of four plus eight or more as day boat. They feel she might benefit from bilge keels, but currently are adding a CP. This 80' craft's annual operating cost is about $150,000.

- J. Leiby reported on OCEANUS, recounting strut problems on maiden voyage. He had high praise for Peterson Builders in their willingness to correct all problems. He showed slides of various tie-down devices aboard OCEANUS, as well as her removable bulwarks.

- R. Redmond reported WECOMA to be very fine even after their long-term usage of YAQUINA. Operated since May, 1976 they have added a Pettibone crane (15 ton cap.), 2 staterooms (16 scientists, 11-12 crew), a 22' boat on davits, 60 tons ballast, and have extened her main lab out to starboard side.

They use a crutch as an A-frame successfully. They find storage space a problem, but hiring ex-submariners might solve this problem!

- Status of Regulations. A memo dated 29 November 1976 and an article entitled "Legal Position of Research Ships in the U.S." both by J. Leiby are included in this report. The latter, although written in 1968, is still mostly valid.

Leiby mentioned during general discussion that the New Tonnage Convention puts length, beam, and volume into a formula to produce gross tons. This convention is not fully ratified even yet and when it is, if it is, there would

be a grace period before finally taking effect. Our main fear is that it would stifle new construction. There was speculation as to what the OCEANUS class would have cost if built to Subchapter U specifications.

- R. Elder, representing NSF-OCE, reviewed the history of the recent marine insurance study, conducted by Risk Engineering. He noted:

  - purchasing power of UNOLS members not exhibited
  - knowledge not all collected either
  - present brokers perhaps not best available
  - wide variation in deductions, rates
  - loss history incomplete, but generally good
  - university rates may rule out participating in group plan

His office feels something further should be done with the report's recommendations as in past meetings, there was no consensus as to further action, perhaps because of diverse ways insurance is handled. T. Stetson feels rates might go up when insurers become aware of the nature of oceanographic work. Whereas, most vessels go from point A to point B as fast as possible R/Vs do not.

Urged by NSF-OCE, UNOLS will try to convene a small group representative of the insured.

- C. Buehrens delivered a paper entitled "Notes on R/V ENDEAVOR" appended hereto. There was some discussion centered on his last paragraph, but his concern with safety was with using her crane at sea. There is ample expertise in this group to lend a hand if called upon.

- Other Items

1. Van Nield spoke on the continuing need the USN has to know the plans and whereabouts of the Nation's R/Vs. While there exists a reporting mechanism, there may be room for streamlining it and/or adopting other reports, such as the foreign cruise prospectus, to be more informative to the Navy and less burdensome to reporting institutions. He and UNOLS will attempt to work something out.

2. T. Stetson announced USCG ships of opportunity will be operating off Juneau, Alaska, for 1977-78.

3. P. Branson reported on a modification of the ISELIN as replacement for AGASSIZ. With a crew of 12, they plan accommodations of 13-15 scientists. She's to have same propulsion system, but 200KW generators instead of 150KW. They plan power take-offs from front of main engines. Hydraulic bow thruster to be retractable. They have 3.2 million of State funds, but it might not be enough.

4. A. Vine spoke on advantages of aircraft shipping containers, some of which are:

- vermin proof
- customs are accustomed to handling
- rate based partly on cubic footage rather than weight, up to limits
- use of would lessen number of boxes

5. A. Vine gave a discourse on stabilizers popularly known as "flopper stoppers". They can "buy you sea states". He noted U. of Texas and the Harbor Branch Foundation employs them. He felt vents in the horizontal surface might speed their sinking, whereas plummetting presently takes 2-3 meters. He would like to get feedback from scientists as to how much more work they might have accomplished on a given cruise had they been able to "buy a sea state or two."

Wednesday, December 1st

A cruise in Narragansett Bay on ENDEAVOR gave all who went a chance to inspect the newest research vessel underway. RVOC thanks Capt. Bennett and his crew for this opportunity.

Note of Appreciation

At Tuesday noon, evening, and Wednesday noon, U.R.I. with C. Buehrens as host, treated RVOC to very substantial repasts. On Tuesday evening Dean Knauss introduced Capt. R. P. Dinsmore who gave a short farewell address upon his leaving the UNOLS office.

RVOC wishes to take this opportunity to thank Bob for his steady hand upon the helm, and all wish him fair winds.

T. Stetson
Executive Secretary
UNOLS
December 3, 1976

Prepared for Research Vessel Operators Council meeting, 30 November 1976 at Narragansett, RI. The author is attached to the Marine Office of the University of Rhode Island, Graduate School of Oceanography.

ON THE INFLUENCE OF TONNAGE MEASUREMENT UPON RESEARCH VESSELS

By David B. Bannerman, Jr.

Opinions expressed in this paper are those of the author and not necessarily endorsed by URI/GSO.

One of the most influential factors in determining the design of the "Oceanus" class of research vessel, perhaps more than the capacity to accomplish its mission, has been the specification that the completed vessel must measure less than 300 gross tons. While some advantages seem to be gained, especially in the area of costs, it is submitted that a more effective approach, from the standpoint of both costs and suitability, would be to seek a change in the law which requires research vessels, if over 300 gross tons, to comply with certain regulations while those of less tonnage are not required to do so. The process might require some time, but it has been found that reasonable men will agree to changes which are reasonable and properly presented. One should not feel that the law of the Medes and the Persians (1) must apply to the comparatively new science of oceanography.

The author assumes that the reader is aware that gross tonnage has, for many years, been a measure of volume and not of weight.

The strongest argument against the use of gross tonnage as a cut-off point is to be found in the tonnage regulations themselves (2). A recent

review of some of the history of tonnage regulations leads to the conclusion that any system of measurement has a detrimental effect on the design of ships, to the point of endangering their seaworthiness, or at least the security against the sea of the closure of openings. This is the result of designing the ships to minimize the tonnage, because many charges and some regulations are based on the gross tonnage. So many tonnage laws in the past were oversimplified, being based on ships then existing, that it was natural for owners to seek to take advantage of the simple rules to keep down the tonnage of newly designed vessels. An extreme case is the so-called Thames tonnage measurement rule, which does not include the depth of the vessel in calculating the volume for tonnage, but instead uses a function of the beam. This left an obvious loophole to increase the depth without any penalty in tonnage, and lead to the construction of ships described as "cranky" (3) or unmanageable.

Since it does not apply to research ships generally, the practice of fitting a "tonnage hatch" in the weather deck of many dry cargo ships will not be discussed in detail. Suffice it to state that the phony (4) nature of that arrangement makes it possible to exclude from tonnage measurement the entire length of the upper 'tween deck space, altho cargo is carried in practically every bit of it.

The device with which research vessels as well as commercial types are concerned is the "tonnage opening" in bulkheads. This consists of methods of closing openings deliberately intended to fall short of the detailed requirements for access doors leading to closed spaces which con-

tribute to the reserve buoyancy of the vessel. If this seems an anomaly, it indeed is, but has been recognized for years as one method of excluding superstructure spaces from gross tonnage.

The usual arrangement is now a steel plate, fitted over the opening in the bulkhead without a gasket or sealer, held in place by hook bolts (so they may not perforate the bulkhead); the hook bolts are spaced just over 12". A truly watertight door is often fitted into this portable plate.

As applied to interior bulkheads not being considered in the watertight subdivision of the vessel, the presence of a "tonnage opening" becomes academic; it is submitted that much cost and inconvenience might be saved by merely painting the words "This is a tonnage opening" on the bulkhead and dispensing with the hook bolts and portable plate.

On the other hand, it was the intent of Load Lines 1966 (5) to do away with Class II closing appliances, as these tonnage openings were called in Load Lines, 1930 (6), because they pitted tonnage exemption against the safety of the ship. As a result of this change, the International Load Line Convention, the United States Load Line regulations and the classification rules of the American Bureau of Shipping all require that access doors to superstructures on the freeboard deck are to be closed by doors which are permanently attached to the bulkhead (as by hinges), closed on gaskets and capable of being operated from both sides. Furthermore, it is required that the opening in the bulkhead be "framed, stiffened and fitted so that the whole structure is of equivalent strength to the unpierced bulkhead.." (7).

The author finds it difficult to consider a "tonnage opening" plate, even when provided with a watertight door within its boundaries, as meeting either the letter or the intent of these regulations. Yet the only access openings to the superstructure of the "Oceanus" class vessels from the freeboard deck are of that nature.

The foregoing means of reducing tonnage are, however, merely inconvenient and a legal fiction. A more objectionable provision of the regulations when used to meet a tonnage cut-off point in the case of a research vessel is the exemption of spaces assigned exclusively to water ballast. While some ballast space must be provided to adjust trim and ship motions, and ought reasonably to be exempt fron tonnage, the commitment of large volumes of well situated underdeck space solely to reduce the vessel's tonnage deprives the design of much-needed storage space.

The irony is that, while the design in question and others like it are below the cut-off point of 300 gross tons through the use of the arrangements described, the owner is in fact paying for a larger ship but not getting a useful one of its actual size. For a research vessel, the cost of tonnage exemption may be unduly high. Attention has not generally been called to this situation because familiarity with tonnage regulations, particularly the devices for circumventing them, has sometimes been given an esoteric air to promote the practice of the "experts".

Other criteria might be used to define the cut-off point between inspected and uninspected vessels, length being the most promising, as used in the 1966 Load Line Convention (5). Displacement might be used, but this

could be difficult to determine for some existing vessels and might also encourage the adoption of unduly light scantlings, skimping on fuel capacity or some other undesirable quality, in new designs.

The U. S. Coast Guard regulations governing research vessels (8) exempt such ships from a number of provisions of regulations applying to vessels in other services; those regulations were made before the appearance of ships engaged solely in scientific research. It is proposed that the cut-off point between inspected and uninspected research vessels in terms of gross tonnage should also be dropped and that special requirements be adopted instead, related only to research vessels. Limitations should be kept in mind when drafting such regulations to preclude their use as a means of evading some requirements by vessels which are not strictly in scientific research service.

A length criterion of 200 feet, or even 250 feet, is suggested as a cut-off point to be substituted for the existing 300 gross tons cut-off point.

As a minimum the proposed regulations should include provision for structural integrity, security of closing all openings, life saving equipment, fire fighting equipment and radio communication, also the vessels should be ineligible to carry cargo or passengers for hire in either international or domestic trade. Other possibilities to be considered include a requirement that vessels approved under the special regulations be built in the U. S. A., that they be operated by a non-profit organization, or that they meet the rules of a recognized classification society, or any or all of these, and perhaps others.

The high costs of building and operating the sophisticated vessels necessary to conduct meaningful oceanographic research make it imperative that none of the limited funds available be expended to evade or avoid existing regulations without a corresponding return in the effectiveness of the vessels.

References

(1) The Old Testament, Daniel 6:12 "According to the law of the Medes and the Persians, which altereth not."

(2) Measurement of Vessels, 1966 Reprint, Treasury Department, Bureau of Customs.

(3) Tonnage Measurement - Historical and Critical Essay; A. Van Driel, Government Printing Office, The Hague 1925.

(4) Webster's Seventh Collegiate Dictionary.

(5) International Convention on Load Lines, 1966

(6) International Convention respecting Load Lines, 1930.

(7) Reference (5) above, Annex 1, Regulation 12 - Doors.

(8) 46 Code of Federal Regulations, Chapter 1, Subchapter U, Coast Guard, Department of Transportation, Parts 188 through 196.

Office Memorandum • WOODS HOLE OCEANOGRAPHIC INSTITUTION

TO : RVOC Members

DATE: 29 November 1976

FROM : Jonathan Leiby

SUBJECT: Legal Position of Research Vessels
A Brief Review of Current Status and Actions

A. 1. Category
2. Documentation, Numbering and Other
3. Inspection
4. Load Line
5. Manning
6. Solas
7. Gross Tonnage Measurement
8. Miscellaneous

1. CATEGORY
Research ships owned and operated for the purposes of the Federal Government are public vessels. All others are private vessels.

The Congress (P.L. 89-99) defined research ships as vessels which are not in trade or commerce and which are not to be considered passenger ships.

2. DOCUMENTATION, NUMBERING AND OTHER
All vessels engaged in trade and commerce must be documented. All other private vessels must be numbered. Public vessels are not required to be documented or numbered.

3. INSPECTION
Private motor propelled research vessels over 300 gross tons must be inspected under subchapter U. Those below 300 gross tons are subject to subchapter C.
Public research vessels are subject to neither, but often meet the above regulations on a voluntary basis.

4. LOAD LINE
All old research ships over 160 gross tons, and all new research ships over 79' are required to have a load line, which is assigned on the basis of:

a. Certain standards of watertight and structural integrity administered by the American Bureau of Shipping or equivalent classification society.

b. Stability considerations reviewed by the U.S. Coast Guard.

5. MANNING
Research vessels over 100 gross tons are required to have 75% of the crew rated as able-seamen.
Documented research vessels over 200 gross tons are subject to the Officers Competency Act.
Research vessels over 300 gross tons have manning levels prescribed as part of their inspection.

6. SOLAS
Documented research vessels over 500 gross tons are subject to the provision of the Safety of Life At Sea Convention.
IMCO has had proposals to draft special SOLAS recommendations for all research vessels, but the subject is currently dormant.

7. GROSS TONNAGE MEASUREMENT
The 1969 Convention, as yet not ratified, would substitute a simple formula using a vessel's external dimension for the archaic system of measuring internal volumes with exemptions and exceptions. Since it would greatly increase the gross tonnage of a number of classes of vessels IMCO has agreed to consider proposals for both an interim and a permanent solution to such problems.

8. MISCELLANEOUS
The UNOLS publication "Research Vessel Safety Standards", May, 1976, should be familiar to all RVOC members.
A paper prepared by the writer in 1968, "Legal Position of Research Ships in the United States", is included for more background. This paper was published in 1968 by the F.A.O. in Rome, and is presently being updated.

JL/kee
Enc.

JONATHAN LEIBY

LEGAL POSITION OF RESEARCH SHIPS IN THE UNITED STATES

1 BASIC CLASSIFICATION OF SHIPS

One can simplify the legal classification of ships in the United States by considering them as either public vessels or private vessels. Public vessels are those owned and operated for the purposes of the federal government. Private vessels are all others. Historically, public vessels were ships of war and were commissioned as such. Private vessels were initially either merchant or fishing vessels. Later this grouping came to include yachts and these three classifications remain today the major categories of private vessels.

2 ORIGIN OF SHIPPING REGULATIONS

The basic concern of the government with the nations shipping originated with the protection and regulation of trade and commerce and with the proper representation and identification of such shipping abroad. Thus it was early required that all vessels in commerce register with the government to receive in effect a license to engage in trade and by which to officially proclaim their nationality in foreign waters. Similar licensing is required for the fisheries trade. Since 1912, it has also been possible for yachts to be documented but more as a matter of courtesy and prestige and is not required. All vessels which are not engaged in trade and commerce, which of course includes public vessels, are not required to be documented.

Initial government regulation of shipping had its origin then in the protection of trade and commerce. For example, early boiler explosions led to the inspection of steamboats in an effort to protect passengers and commerce; the later adoption of load line marks was an effort to protect the shipper and his goods from loss of an overloaded ship. The later adoption of international agreements and other efforts to establish uniformity in international shipping was primarily in the interest of protecting the nation's commerce and trading position. In that the fishing industry was not required to be competitive from an international trading

point of view and because until landing the catch they were carrying their own goods, there has been much less incentive for government regulation of fishing vessels. In a similar way yachts "not engaged in trade" were mostly exempt from regulations of shipping. Government owned vessels have also been exempt from the statutes which regulate private shipping since they are not engaged in trade and are not a factor in the nation's commerce and because they are government owned they are self regulating. In addition, except for vessels of war which follow special dictates, this fleet, which consists largely of service, survey and patrol craft, is domestically oriented and their identification in foreign waters is not an important factor.

3 DEVELOPMENT OF REGULATIONS

Over the years, development and revision have expanded the shipping regulations beyond the intent of their origin into a less specific compilation of maritime laws. In part, this has been statutorially directed and part of it has been the result of administrative development and expansion. In many cases, the shipping laws have been used as the vehicle for the protection of domestic labor and various segments of the economy, of which ship-building and the fisheries are examples.

4 SUMMARY OF PRESENT SHIPPING REGULATIONS

At the present time, U.S. regulations can be broadly summarized as follows:

4.1 Registration

Vessels which must be registered with the federal government are vessels in foreign trade over 5 net tons and vessels in domestic trade or fisheries over 20 net tons.

4.2 Inspection

All powered vessels above 10 horsepower must be numbered and carry certain basic equipment such as life jackets and lights. The numbering function is generally carried out by the state in which the boat is owned, much as automobiles are registered and licensed. In some states the limit is less than 10 horsepower.

All steam vessels over 65 feet are required to be inspected by the Coast Guard and carry licensed operators.

All seagoing motor vessels over 300 gross tons with the exception of fishing vessels, are required to be inspected by the Coast Guard.

4.3 Manning

All registered vessels over 200 gross tons are required to carry licensed officers.

The above do not apply to passenger vessels which are required to be inspected and carry licensed operators when carrying more than 6 passengers.

5 POSITION OF RESEARCH VESSELS

In general, at the present time in the United States, research vessels are operated by three distinct groups (Vine and Leiby, 1967):

Directly by the federal government, such as the fisheries research ships of the Dept. of Interior's Bureau of Commercial Fisheries, and the oceanographic and survey ships of the Dept. of Commerce's Coast and Geodetic Survey and the U. S. Naval Oceanographic Office;

by the academic laboratories whose basic research programs are sponsored largely by various federal agencies;

and by industrial concerns which engage in company sponsored research such as the major oil companies, or who provide research vessels and services under charter.

None of these ships are engaged in trade or commerce. Those operated by the federal government are considered to be public vessels, and those operated by the academic laboratories and industry are considered as private vessels. It is noted that ships owned by the several academic laboratories which are connected with State universities, and therefore State owned ships, are considered private vessels under federal law.

6 APPLICATION OF SHIPPING LAWS TO RESEARCH VESSELS

It is an historical fact that procedural arrangements evolve into such established patterns that new developments are made to conform to existing routine even though they may originate from entirely different premise. This is what has happened with U.S. research vessels.

Until the early 1950's such vessels were relatively small and insignificant in number and their problems were few, but with the increased emphasis on oceanography the increase in numbers and size of these ships became a factor which could no longer be ignored. Various attempts were made to categorize those which were not government owned as public vessels, merchant cargo or passenger ships, fishing vessels, or yachts. The first ships of appreciable size were recognized as a new phenomenon which could not readily be classified in traditional terms, were too insignificant in number to overcome the reluctance to change in routine. Therefore, although they were not in trade or commerce, they were clearly neither fishing vessels nor yachts, and strong efforts were made to classify them as merchant vessels, with all the ensuing inapplicable regulations.

In reality, research ships are operated, by the inherent nature of their research work, in the public interest. This is emphasized by the fact that these ships, especially those operated by the academic laboratories, are, in the majority of cases, not only totally supported but were originally supplied to the laboratories by the various federal agencies active in oceanography.

It is anomalous that the federally operated research ships, doing the same work for the same purposes, by virtue of being public vessels, can be operated without application of the inappropriate regulations of merchant vessels.

As an example of the confusion and consternation which arose, on inspected vessels it was determined that there was a limit not only to how many persons could be aboard but upon the kind of persons allowed. Definitions existed for only two kinds of persons: passengers and crew. The crew were required to have certain proof of their qualifications and the scientists with no such papers were to be classed as passengers. It was found that if there were more than 12 such scientists, the ship then would be designated a passenger ship, and since the carriage of passengers implied engagement in trade, the ship would be required to register. At this point, it was estimated that meeting all regulations for registered passenger ships would void the usefulness of the ship as a research vessel.

7 OCEANOGRAPHIC VESSEL ACT

The result of such dilemmas was that the Congress passed a research vessel act which provided:

1. A definition of research vessels.
2. That research vessels were not engaged in trade or commerce.
3. That scientists were not to be considered as passengers or seamen.
4. That research ships were not to be considered as passenger ships because of the carriage of scientists, and
5. That the Coast Guard could reduce existing regulations where they were inapplicable to the mission of a research vessel.

While the passage of this act has led to the compilation of a separate set of regulations for the inspection of research vessels (1968), all the legal and regulatory problems have not dissolved. Research vessels are still faced with merchant vessel regulations within domestic law and the restrictions of several international agreements. These matters are under discussion at the present time, and it is not certain what the end result will be.

8 PRESENT REGULATION OF U.S. RESEARCH SHIPS

The following situation presently exists with respect to United States research vessels:

Vessels owned and operated by the federal government are public vessels and not subject to registration or inspection regulations. However, some particularly those operated by the Military Sea Transportation Service for the U. S. Naval Oceanographic Office, voluntarily meet the inspection regulations when reasonably able to do so.

Private vessels, operated by the academic laboratories and industry, not being in trade or commerce are not required to be registered and therefore comply with the state numbering act. Below the size where they are subject to inspection they are subject to the regulations for uninspected vessels.

Private vessels over 65 feet if steam powered and over 300 gross tons if motor vessels, are subject to inspection regulations. Manning requirements have been imposed on these vessels as a part of inspection.

Private vessels which are not registered are not subject to the Officers Competency Act or to the SOLAS conventions.

9 INTERNATIONAL POSITION

On an international scale, there also exists no appreciation for the unique origin and motives of research vessels. In many nations, national ownership of these fleets may make the problems less obvious but nevertheless there are many subtle restrictions imposed from the inadvertent application of standards and regulations drafted for protection of international trade and commerce. Many such conventions exempt the established non-trading categories of ships, such as yachts, fishing vessels and government operated vessels, and the proper status of research vessels must similarly be established. As a recent example, a small change in the convention on load lines has caused a major problem for research vessels. The former convention applied to merchant vessels where the new convention applied to all vessels with the exception of ships of war, yachts and fishing craft. This will inadvertently require the retroactive application of load lines to many research vessels now in service which were previously exempted. Furthermore, if met, the new requirement will impose inapplicable standards developed for the limitation of cargo carriage for the protection shippers. Any such mark on a ship configured as are most research ships should of course be based upon some other criteria such as stability limits rather than structural standards.

10 CONCLUSION

It is the intent of this paper to present the background of one nation's problems with the application of existing shipping laws to research vessels, and to hopefully initiate a discussion on the international aspects of this problem.

Hopefully such a discussion may lead to the necessary international legal recognition required by research vessels.

11 REFERENCES

Vine, A.C. and J. Leiby, Status of Oceanographic Ships in the United States with a view into Future Developments, Phila. Section, Soc. Naval Architect and Marine Engineers, and WHOI Ref. No. 67-11, 23 p., 1967.

Federal Register, Oceanographic Vessels; Inspection and Certification, Washington, D.C. 33(19) 1968.

Notes on R/V ENDEAVOR

by
C. A. Buehrens

Last year Jonathan Leiby of Woods Hole Oceanographic Institute gave and distributed a paper entitled "History, Design Criteria and Construction of a High Powered Intermediate Sized Oceanography Ship".

The R/V ENDEAVOR is the third ship in this series, the first being R/V OCEANUS operated by Woods Hole Oceanographic Institute and the second being the R/V WECOMA operated by Oregon State University. All three vessels are owned by National Science Foundation of the U. S. Government.

Initially the University of Rhode Island engaged the services of John W. Gilbert Associates, Inc. of Boston, MA to prepare modified contract plans, working with our ship committee. Principal changes consisted of widening the main laboratory by two feet, the addition of a special purpose laboratory on the starboard side of the break deck aft of the galley, and the addition of a wet laboratory immediately aft of the special purpose laboratory. Separate quarters were provided for the Captain aft of the chart room enabling us to carry a total of 14 scientists.

Secondly the University of Rhode Island engaged the services of Potter and McArthur, Inc. naval architects of Boston, MA who prepared a study including an independent electrical load analysis, a study of voltage drops with various existing oceanographic winches and economic considerations in regard to winch conversions. As a result of this study, U.R.I. determined that it

was most economical to convert our existing Almon A. Johnson Series 250 deep sea winch to 440 Volt AC electro-hydraulic drive and to convert our existing Markey DESS-3 hydrographic winch to electro-hydraulic drive as our existing Markey DUS-3 hydrographic winch had been similarly converted some years earlier by Markey for R/V TRIDENT and had proven to be very successful in operation.

Accordingly it was determined to eliminate the reduction gear shaft driven DC generator and to add another 200 KW Caterpillar diesel AC generator. On this basis the contract was signed with Peterson Builders, Inc. This gives R/V ENDEAVOR the capability to continue the scientific program in the event one of the 300 KW generators must be down for repairs. Needless to say the benefits of building a third ship in the series included having the hulls identical so all lofting was done and most of the engineering work was done.

Since Peterson Builders, Inc. retained R. A. Stearn, Inc, of Sturgeon Bay, Wisconsin to prepare working plans, the University of Rhode Island similarly engaged them to prepare working drawings for owner-furnished equipment. This included winch conversions, a J. T. Hydrophone installation, the Stern "U" Frame, the Side "J" Frame and the deck crane foundation. The deck crane was purchased from Woods Hole Oceanographic Foundation as was the fuel oil purifier.

The bow thruster drive is a 320 HP 560 Volt DC motor rewound for a maximum 680 rpm. The silicon controlled rectifier drive was designed and built by Walco

Electric Co. of Providence, RI to provide completely variable speed. The associated steering control was patterned after that developed by Woods Hole Oceanographic Institute for R/V OCEANUS and R/V WECOMA.

This vessel has been built to American Bureau of Shipping classification for hull and machinery as a research vessel.

Basically, the Marine Office of the University of Rhode Island feel that U.R.I. has been given a good hull to operate. The shipbuilder has built the vessel well. Many of the various U. S. Coast Guard laws, rules, or regulations that dictate such limitations as tonnage, manning, etc. leave reservations in mind about how successfully and safely this ship will be able to accomplish multi-discipline deep ocean research for the Graduate School of Oceanography for the University of Rhode Island.

Prepared for Research Vessel Operators Council meeting, 30 November 1976, at Narragansett, RI. The author is Marine Superintendent of the University of Rhode Island, Graduate School of Oceanography.

ATTENDEES

1976 RVOC MEETING

NAME	LAB	PHONE NO.
David B. Bannerman, Jr.	URI/GSO	(401) 364-6621
Peter Branson	SIO	(714) 452-2356
Cliff Buehrens	URI	(401) 789-1926
Cory Cramer	S.E.A.	(617) 540-3954
Dolly Dieter	Univ. of Alaska	(907) 224-5261
R. F. Dinsmore	W.H.O.I.	(617) 548-1400
Alyn C. Duxbury	Univ. of Washington	(206) 543-0444
R. S. Edwards	W.H.O.I.	(617) 548-1400
Robert B. Elder	National Science Foundation	(202) 632-4102
Bill Erb	Dept. of State	(202) 632-0650
Bob Ewing	Univ. of Texas	(713) 765-2173
Sam Gerard	Lamont-Doherty	(914) 359-2900
Jim Gibbons	Univ. of Miami	(305) 350-7223
William Hahn	URI	(401) 792-6137
William G. Harkness	Univ. of Hawaii	(808) 847-2661
Tony Inderbitzen	Univ. of Delaware	(302) 645-4320
Jay Katz	Univ. of Michigan	(313) 764-6202
Jon Leiby	W.H.O.I.	(617) 548-1400
Dean Letzring	Texas A&M	(713) 744-3604
Jon Lucas	S.E.A.	(617) 540-3954
Don Milligan	OCEANAV	(202) 325-9275
Eric B. Nelson	Duke	(919) 728-2111
Van Nield	NORDA	(202) 692-4953
Dick Redmond	Oregon State	(503) 754-4447
Murice Rinkel	SUSIO	(813) 896-5197
Bob Schelling	Univ. of Washington	(206) 543-5648
Harold Screen	CBI/Johns Hopkins	(301) 338-8256
Bob Sexton	URI	(401) 792-6197
Tom Stetson	UNOLS	(617) 548-1400
Richard C. Swenson	NORDA	(601) 688-4712
Cliff Tetzloff	Univ. of Michigan	(313) 763-3183
John Thompson	Univ. of Texas	(512) 749-6760
Sandra Toye	NSF-OCE	(202) 632-4102
Eugene B. Veek	Univ. of So. California	(213) 746-6840
Allyn Vine	W.H.O.I.	(617) 548-1400
Boyce Watkins	Univ. of Washington	(206) 543-5062
John Zeigler	VIMS	(804) 642-2111