UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

RESEARCH VESSEL OPERATORS COUNCIL

Summary Report of the 1988 Annual Meeting

Sessions held at the University of Washington Seattle, Washington 4 - 6 October 1988

CONTENTS

APPENDICES

SUMMARY REPORT OF THE 1987 ANNUAL RVOC MEETING
UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON
4 - 6 OCTOBER 1988

WELCOMING REMARKS

Captain Bill Jeffers; Dr. Ross Heath, Dean, College of Ocean and Fisheries Science; and Dr. Arthur Nowell, Director, School of Oceanography, University of Washington welcomed the RVOC to the University.

The meeting was called to order by Chairperson Jack Bash, Marine Superintendent, University of Rhode Island. The meeting followed the agenda outlined in Appendix I. The registered attendees are listed in Appendix II.

OLD BUSINESS

A motion was made, seconded and passed to accept the minutes of the 1987 meeting. The following items of old business were discussed.

RVOC NEWSLETTER

Jim Williams thanked those that submitted items for the Newsletter, and reminded members of the need for input, particularily safety items. Members voted to maintain the publication on the twice per year schedule.

MAS STATUS

Bill Barbee announced that the contract with MAS had been renewed for three years. Most RVOC users expressed satisfaction with the service. However, there was no interest indicated by the members for expenditure of funds to purchase future "Reviews of Injuries and Illness Aboard Research Vessels of the University National Oceanographic Laboratory System", in that the data should be readily available through the current contract.

PERSPECTIVE STATUS

Bill Barbee discussed the security training conducted by Perspective and asked for comments and recommendations concerning continuation of the service. It was agreed that in the short term no follow on training was necessary.

COMMUNICATIONS GUIDE

Ken Palfry announced that the Communications Guide was distributed two weeks prior, and that comments, feedback and updates are welcome. Ron Hutchinson recommended, and members concurred, that Ken be complimented for producing the excellent document.

AGOR 23 STATUS

Bill Jeffers presented an update of the Agor 23 project. (See Appendix III)

WINCH AND WIRE UPDATE

Jack Bash discussed the Traction Unit System installed to handle .322 and .250 wire on Endeavor. He also described the Motion Compensation Device that he married to the system for a "cost of $27,000 which takes 75% of the movement out of the package." Jack also mentioned that gliches remain that are being corrected by minor adjustments.

John Lund described NOAA's experience with the Kevlar Handling Device on Discoverer. Problems remain with structural bolting (mounting) and the electro-hydraulic interface. The device accommodates 10,000 meters of 1/2" Kevlar using a Lebus Screw, and fleet angle compensator. It is designed to operate at 600 feet per minute in manual, and 1200 feet per minute in the motion compensated mode. The device has not tested satisfactorily as yet. However, John Lund believes it still has possibility of working.

Larry Clark described a grant that had recently been provided to one of our institutions for the design and development of a High Speed Rosette Package System that will be motion compensated.

LAY-UP LETTER

Jack Bash reviewed the current status of the "Lay-Up Letter" (see Appendix IV).

NEW BUSINESS

UNOLS CHARTER CHANGE

George Keller, Bill Barbee and Jack Bash briefed the gathering on a change pertinent to the RVOC. The term COUNCIL in RVOC would be changed to "COMMITTEE", to streamline the relationship with UNOLS, for both participation and coordination. The chairmen of the RVOC would remain as elected by the membership of the RVOC and would be a member of the UNOLS advisory board. The response to this intended change by RVOC members was cautious acceptance, after assurances by George Keller and Bill Barbee that the selection of the RVOC Chairman by election, would remain as presently spelled out in the Charter.

PORT GUIDE

Ken Palfrey discussed the value of a Port Guide and indicated that he would be willing to compile the information, in a manner similar to the Communications Guide now in place. Interest was expressed by many members. However, the means of promulgation, and keeping the "Guide" current, was not decided. (See Appendix V)

ZERO TOLERANCE

Joe Coburn, Bill Coste and Jim Williams described the experience they have had with enforcement officials, and policies they have implemented. The Zero Tolerance Program is totally supported by the RVOC membership. However, the methods of support vary as to state and institution.

Jack Bash discussed the letter he received from Don Heinrichs and with the assistance of Mike Prince and others, composed a reply stating the RVOC position. (See Appendix VI)

FEDERAL REGISTER MONITOR.

Bill Barbee indicated that he is working on acquiring funds from NSF to contract for a clipping service to provide information contained in the Federal Register, pertinent to the interests of RVOC members.

AGENCY REPRESENTATIVE REPORTS

NATIONAL SCIENCE FOUNDATION

Larry Clark related the interest expressed by the leadership of NSF concerning safe operation of our fleet, and prevention of pollution. Larry also provided an update on the current organization and relationships within NSF, and a general overview of the proposed 1989 NSF budget.

U.S. STATE DEPARTMENT, Tom Cocke, presented an overview of the current situation at State concerning foreign clearances, and summarized with three general comments:

1. Scientists are doing better in cooperating with clearance policies.
2. Clearances are becoming more difficult to get.
3. Coastal states are generating more requirements.

Tom mentioned that he handled three times more clearance requests this past twelve months than three years ago.

SPECIAL REPORTS

REVISED CLEARANCE HANDBOOK

Lee Stevens discussed his handbook and the use of the clearance checklist. Lee indicated that he handles clearances for JOI/ODP, and voluntered his services to assist UNOLS members. Lee said that his handbook needs updating.

Some members indicated an interest in Lee's offer to assist them in obtaining clearances

via the established process. However, others will continue to use their own offices, now in place, to liason with the State Department.

REGULATORY POLICY AND GMDSS UPDATE

George Ireland presented a review of current changes to Maritime policy affecting the operation of our ships, and provided an update of the GMDSS. (See Appendix VII)

CANADIAN RESEARCH VESSELS

Tony Fitch, Superintendent of Marine Operations, Institute of Ocean Sciences, Sidney, British Columbia, Canada, described the government owned Fishery Patrol and Ocean Science Research Fleet that fall within his purview for the Western Region. (See Appendix VIII)

INSURANCE AND LEGAL REVIEW

Dennis Nixon described the current status of Jones Act as it pertains to state employees. He also reviewed the Marine Insurance picture as it relates to our ships and again reiterated the saving that could be achieved by the formation of a UNOLS P&I Insurance Club.

Dolly Dieter briefed the 1987 Insurance Report, and provided insight into the difficulty she experienced with some of the Institutions in getting their input. Some general comments:

1. "There were a wider variety of marine insurance brokers used by UNOLS in 1975 than 1987".
2. "The difference in insurance costs between sister ships (AGOR 3 Class) is significent".
3. "Some Marine Superintendents had never seen the insurance policies for their ship/ships prior to the 1987 report".
4. There were more losses in 1987 than 1975.

WIRE REPORT

Don Moeller reviewed the current status of the UNOLS Wire Pool and reiterated what he considers as being UNOLS standard:

3/16"	.322
1/4"	.680
1/2"	
9/16"	

"$600,00 of NSF Funds were spent to purchase wire last year." The 3x19 wire rope has experienced few problems. However, that has not been the case for the .322 three

conductor, EM cable. Don indicated that it appears that the larger and heavier instrument packages are stressing the .322 cable.

Sam Gerard asked about the methods in place for capturing performance data on Wire, overall. Don indicated that he keeps track of WHOI Wire but not others. It was suggested that it might be a good idea to have users turn in the history of old wire when requesting new wire.

Don also commented on Fibre-Optics and indicated that it has been used three times at WHOI. Apparently the Fibre-Optic is more difficult to handle than wire, and it needs a larger radius under tension.

REPORT ON BERNIER

Sam Gerard provided a briefing on the status of the Lamont Project to acquire the Research Vessel Bernier. Sam said that Bernier was built by the Canadian Government in 1983 and has been on charter since that time, primarily in the North Sea. He indicated that re-flagging does not appear to be a problem and that, if approved the Ship could be on-the-line by October 1989. Sam, estimated the cost for Bernier would amount to approximately 10.5 to 11 million dollars, modifications included. (See Appendix IX)

SAFETY WORKSHOP

Bill Coste described the work conducted by the RVOC Safety Standards Committee and reviewed the changes recommended. Each member was provided a rough draft of the contemplated changes. Bill indicated that he intends to re-work the proposed changes to the standards one more time and then send them out for review, and approval by members. (The draft was too lengthy to include in the minutes)

Gene Allmendinger, provided an outline of his proposed Safety Training Manual which was received with general approval. The methods of development and production were not finalized. (See Appendix X)

Ken Palfrey discussed video training tapes on shipboard safety that could be used, and demonstrated several that he had obtained. (See Appendix XI)

David Grey from Glosten Associates presented a review of a computerred stability program that is presently in use on NEW HORIZON and ALPHA HELIX.

RVOC members agreed that a training and indoctrination manual is in order, similar to the format and style displayed in the manual published by the NPFVOA, and that it should be produced and printed by a commercial company. It was also agreed that a commercial grade video should be contracted for, that would be used to indoctrinate personnel embarking on UNOLS Ships as to safety procedures and shipboard operations.

Bill Coste indicated that he has been informed that the NSF is willing to fund an

underway training day per ship per year and also to provide re-imbursement for expended safety equipment used for demonstration.

As a pertinent issue, it was announced that the USCG does not recognize the Navy Fire Fighting Schools for purposes of training required for upgrade of licenses. Ken Palfrey mentioned the Washington State Fire Service Training School, in North Bend, Washington that he says is certified. (See Appendix XII)

COMMERICAL PRESENTATIONS

Mike Markey provided an excellent review of current winch capabilities and motion compensation. (See Appendix XIII)

Mike Slattery provided a history of the Alaska Marine Crane, and his company. He indicated that they have sold 700 cranes since 1978, 85 of which were sold in the last twelve months. Of note, is the recent innovation of leasing cranes for specific jobs, for a minimum of three months.

Mike Chapman presented information on a current doppler profiler manufactured by RDI, and a family of ROV's manufactured by Deep Ocean Engineering included.

WRAP UP OF BUSINESS MEETING

1989 RVOC MEETING TOPICS

The issue of wheather or not to have manufacture's representatives on the formal agenda was discussed. The general consensus was to limit formal briefings by manufacture's representatives, while at the same time inviting a selected few to establish booths or exhibits, if they so desire.

The following topics were recommended for the 1989 RVOC meeting agenda:

Satellite Communications
Winches
Zero Tolerance
Jones Act/Insurance Update
Pollution control

Workshop Topics
Safety Standards
Indoctrination/Safety Manual

1989 MEETING LOCATION

Miami, Florida. October - specific dates, as yet unknown.

ELECTION OF OFFICERS

Jim Williams was elected to the post of RVOC Chairman, and Bruce Cornwall to the post of Vice Chairmen/Secretary.

ROUND TABLE DISCUSSION FOR MARINE SUPERINTENDENTS

The following topics were addressed by Marine Superintendents during round table discussion:

Radars
Current Doppler Profilers/Speed Logs
Zero Tolerance/USCG Drug Testing
Alcohol On Board Ships/RVOC Position
Clearance Issues
Relationship of RVOC to UNOLS
Pollution/Plastics
Technicians
Liability

The meeting was adjourned upon completion of the Round Table discussion.

RESEARCH VESSEL OPERATORS' COUNCIL

1988 Annual Meeting
University of Washington School of Oceanography
Seattle, Washington
4-6 October 1988

FINAL AGENDA

4 October 1988 - 0800

Room 316R South Campus Center
University of Washington School of Oceanography

Registration/Coffee - 0800

Welcoming Remarks -0830

- Introduction - Captain William Jeffers
- Dr. G. Ross Heath, Dean, College of Ocean & Fishing Schiences
- Dr. Arthur R. M. Nowell, Director, School of Oceanography
- Remarks from the Chairman

Old Business - 0900

- Minutes of 1987 Annual Meeting
- Winch Manual Update - ONR representative
- RVOC Newsletter - Jim Williams
- MAS Status - Bill Barbee
- Perspective Status - Bill Barbee
- Communications Guide - Ken Palfrey
- AGOR 23 Status - Bill Jeffers
- Winch & Wire Update - Various
- Lay Up Letter - Jack Bash

New Business - 1000

- UNOLS Charter Change - Jack Bash/Bill Barbee
- Port Guide - Ken Palfrey
- Zero Tolerance - Chairman
- Federal Register Monitor - Bill Barbee

Agency Representative Reports - 1030

- National Science Foundation - Larry Clark
- Office of Naval Research - Keith Kaulum
- University National Oceanographic Laboratory System - Bill Barbee
- U.S. State Department - Tom Cocke

Special Reports

- Revised Clearance Handbook - Lee Stevens
- Regulatory Policy & GMDSS Update - George Ireland
- Canadian Research Vessels - Tony Fitch
- NOAA Motion Compensated Winch Experience - John Lund
- MAS Study Report - Bill Barbee
- Fleet Improvement Committee Report -

- Lunch -

Special Reports Cont. - 1330

- Insurance Review - Dolly Dieter
- Legal Review - Dennis Nixon

5 October

Safety Workshop - B. Coste - 0830

- Safety Standards Review - B. Coste
- Stability - G. Allmendinger/Glosten
- Safety Training Time at Sea
- Training Programs
    a. Video Tapes - Ken Palfrey
    b. Safety Manuals - G. Allmendinger
    c. Shore Based Training - LDGO Rep.
- Drug and Alcohol Issues
    a. Policies around the fleet - All
    b. What to do with violators - All
    c. UNOLS Policy Statement (Request for)

6 October

Commercial Presentations - 0830

- Mike Markey - Development in Winches
- Mike Slattery - Oceanographic Cranes
- Mike Chapman - Electronic Equipment Developments/ROV Potential
- Jim Sharkey - Hull Mounted Short Baseline Systems

- Lunch -

Wrap Up of Business Meeting - 1300

- 1989 RVOC Meeting Topics
- 1989 Workshop Topics
- 1989 Meeting Location
- Election of Chairperson

Round Table Discussion for Marine Superintendents

- New Equipment
  a. Radars - Joe Coburn
  b. Profiler - Jim Williams
  c. Speed Log - Jack Bash
  d. Other

- Liability issues - continuation of Dieter/Nixon discussion from day one
- Technician problems
- Plastic/Trash Disposal
- Other

RESEARCH VESSEL OPERATORS' COUNCIL

1988 Annual Meeting
University of Washington School of Oceanography
Seattle, Washington
4-6 October 1988

RVOC REGISTRATION

NAME	ORGANIZATION	ADDRESS	PHONE NO.
J.F. Bash	URI	P.O. Box 145 Saundirstown, RI 02874	401-792-6203
L.C. Weimar	U.Ak	P.O. Box 916 Seward, AK 99664	907-224-3024
George Ireland	ICS	58 No. Briar No. Kingstown, RI 02852	401-885-2822
Eric B. Nelson	Duke Univ.	Beaufort, NC 28526	919-728-2111
Harry Barnes		Bermuda Biological Station	809-297-1880
Ken Palfrey	OSU	Oregon State University Hatfield Marine Sci.Cntr. Newport, OR 97365	503-867-3011 X224
David McWilliams	OSU	Oregon State University Hatfield Marine Sci.Cntr. Newport, OR 97365	503-867-3011 X215
Mike Prince	Moss Landing Marine Labs	P.O. Box 450 Moss Landing, CA 95039	408-633-3534
Dean Letzring	Texas A&M	P.O. Box 1675 Galveston, TX 77553	409-740-4469
Don Newman	USC	820 So Sea Side Ave. Terminal Island	213-830-4570
Donald Bradford	MMA	Water Front Box C-3 Castine, ME	207-326-4311
Steve Rabalais	LUMCON	LUMCON Hwy 56 Chauvin, LA 70344	504-851-2808
Daniel Schwartz	Harbor Branch Oceanographic Institution	5600 Old Dixie Hwy. Ft. Pierce, FL 34946	407-465-2400

Capt.Tony Fitch	Institution Ocean Sciences Canada	Box 6000 Sidney, BC	604-356-6546
Gene Allmendinger	U. New Hampshire	Durham. NH	603-862-2997
Tom Cocke	Dept. of State	Washington, DC 20520	202-647-0240
Dennis Nixon	URI	Kingston, RI	401-792-2147
Lee Stevens	JOI	1755 Massachusetts Ave NW #800 Washington, DC 20036	202-232-3900
Bill Barbee	UNOLS	University of WA Seattle, WA 98195	206-543-2203
Jon King	UW	University of WA	206-543-5648
Dolly Dieter	U.Ak	Box 730 Seward Ave.	907-224-5261
Sam Gerard	Lamont	LDGO Palisades, NY 10964	914-359-2900
Ed Gelb	NOAA	NOAA Ship Discoverer FPO Seattle 98799	
William Mitchell	U.TX, Austin	700 The Strand Galveston, TX 77550	409-761-2276
Jim Williams	SIO	San Diego, CA	619-534-1643
K.W. Jeffers	U.W.	School of Oceanography Univ. of Wash., WB-10 Seattle, WA 98195	206-543-5062
Joe Coburn	WHOI	WHOI Woods Hole, MA 02543	508-548-1400
George Keller	OSU	Research Office Oregon State Univ. Corvallis, OR 97330	503-754-3437
Bruce Cornwall	CBI	4800 Atwell Rd. Shadyside, MD 20764	301-867-7550
John Lund	NOAA PMC	1801 Fairview E. Seattle, WA 98102	206-442-4484
Wadsworth Owen	U. Delaware	CMS Lewes, Delaware 19958	302-645-4320

Bill Coste	U. Hawaii	UMC #1 Sand Island Rd Honolulu, HI 96819	808-847-7654
Bill Clark	U. Hawaii	UMC #1 Sand Island Rd Honolulu, HI 96819	808-847-7654
Linda Goad	U. Michigan	2200 Bonisteel Blvd. Ann Arbor, MI 48109	313-763-5393
Eugene Olson	FIO	830 1st St. So. St. Petersburg, FL 33701	813-893-9100
Ron Hutchinson	U. Miami	3979 Rickenbacker Cswy Miami, FL 33139	305-361-2549
Terry Jackson	PMEL	7600 Sand Pt. Way NE Seattle, WA 98115	206-526-6813
Larry Clark	NSF	NSF/OFS, Rm 609 Washington, D.C.	202-357-7837
Don Moller	WHOI	WHOI Woods Hole, MA 02543	
Dwayne Timmons	NOAA	7600 Sand Pt.Way NE Seattle, WA 98115	
Mike Markey	Markey Machinery Company	P.O. Box 24788 Seattle, WA 98124	206-622-4697
Mike Slattery	Slattery Crane	Slattery Crane Co. Tacoma, WA	
Mike Chapman	MECCO	125 2nd Ave. Duvall, WA 98019	206-788-4522

AGOR-23 ACQUISITION HISTORY

29 May 1986	Program Briefing to Industry
30 May 1986	NAVSEA Feasibility Designs Completed
30 July 1986	NAVSEA Acquisition Plan (AP) Approved
27 August 1986	Assistant Secretary for Shipbuilding & Logistics Endorsed AP
29 September 1986	Chief of Naval Operations Top Level Requirements (TLR) Signed and Forwarded to NAVSEA
24 October 1986	NAVSEA Circular of Requirements (COR) Approved
27 May 1987	Solicitation for Design & Construction issued
5 June 1987	Solicitation of Operation issued
31 August 1987	Solicitation for Operation closed
15 November 1987	University of Washington selected as prospective operator
29 February 1988	Solicitation for Design & Construction closed
2-11 May 1988	University of Washington representatives reviewed D & C proposals as advisors to the Source Selection Evaluation Board
10 June 1988	Contract for Design & Construction awarded to Halter Marine Inc.

AGOR-23

Builder:	Halter Marine Inc.
Shipyard:	Moss Point, Mississippi
Delivery Date	December, 1990

Dimensions:		
	LOA	268'
	Beam	52 1/2'
	Full Load Draft	17'
	Full Load Displacement	3099 L.T.

Propulsion: Diesel-Electric, SCR power.
Twin 360 azimuthing stern thrusters, rated at 3000 HP each
~~600~~ 1688 HP water jet, rotatable bow thruster.

Power:
Primary Propulsion Power
3 1500 KW Caterpillar engines with Kato generators.
Primary Electric Power
3 715 KW Caterpillar engines with Kato generators.
Emergency Generator Power
1 250 KW Caterpillar engine with Kato generator
MG sets for 88 KW of clean power for Labs plus clean power for scientific equipment

Cruising Speed: 15 knots

Endurance: 33 days at 15 knots plus 29 days at 3 knots

Accommodations:
20 Officers and Crew
30 Scientific Party
10 additional in 2 deck vans

Working Deck Area: 3,500 sq.ft. including 12' x 100' contiguous overside handling area on stbd side

Laboratories:	4000 sq.ft. of Principal Laboratory space. including:	
	Main and Hydro Labs	2000 sq.ft
	Wet Lab	290 " "
	Staging Bay	390 " "
	Bio-Chem Analytical Clean Lab	330 " "
	Electronics/Computer Lab	720 " "
	Darkroom	150 " "
	Climate Control Chamber	8'x8'x10'
	Scientific Freezer	8'x8'x10'
Scientific Storage:	4 compartments with a combined area of 1875 sq.ft. and total volume of 15,000 cu.ft.	
Loading Capacity:	Deck Cargo	100 L.T.
	Scientific Stores	135 L.T.
Navigation:	Radars/CAS	Gyrocompass
	Loran C	Speedlog
	GPS/SATNAV	RDF
	Dynamic Positioning System	Fathometers
Communications:	Radio-telephone & RATTY - HF/SSB	
	" " - VHF/FM	
	INMARSAT (Phone, Telex, Facsimile)	
Cranes:	2 - Allied Marine TB-40 telescoping heavy duty lift cranes	
	2 - Portable Hiab "FOCO" Model 180 Sea Cranes; articulating	
Winches:	1 - Markey DESH-5, 75HP electric winch with 10,000 meters of 1/4 inch wire rope	
	1 - Markey DESH-10 electric winch with 40,000 ft of 9/16 inch wire rope	
	Space for 1 additional DESH-5 and DESH-10 winch	

Handling Gear:	1 - Hydraulically activated J-Frame on stbd side rated for 12 tons static load and 2 tons capacity in motion: 20 ft high; 4-ft inboard reach; 6 ft outboard reach
	1 - Hydraulically activated stern A-frame rated for 12 tons static load and 6 tons capacity in motion. Inside clearance 20 ft at base, 16 ft at top. Vertical clearance of 25 ft; 8 ft inboard reach; 10 ft outboard reach.
Scientific SONARS:	Raytheon 3.5 KHz " 12 KHz RD ADCP 150 kHZ Space for SEABEAM
Boats:	1 - 26 ft RIB workboat with twin 85 HP outboard motors 1 - 19 ft RIB rescue boat with one 85 HP outboard motor
Scientific Vans:	2 - Std. 8'x8'x20' ISO container vans Space for two additional vans
Seismic Surveys:	600 HP for air compressors

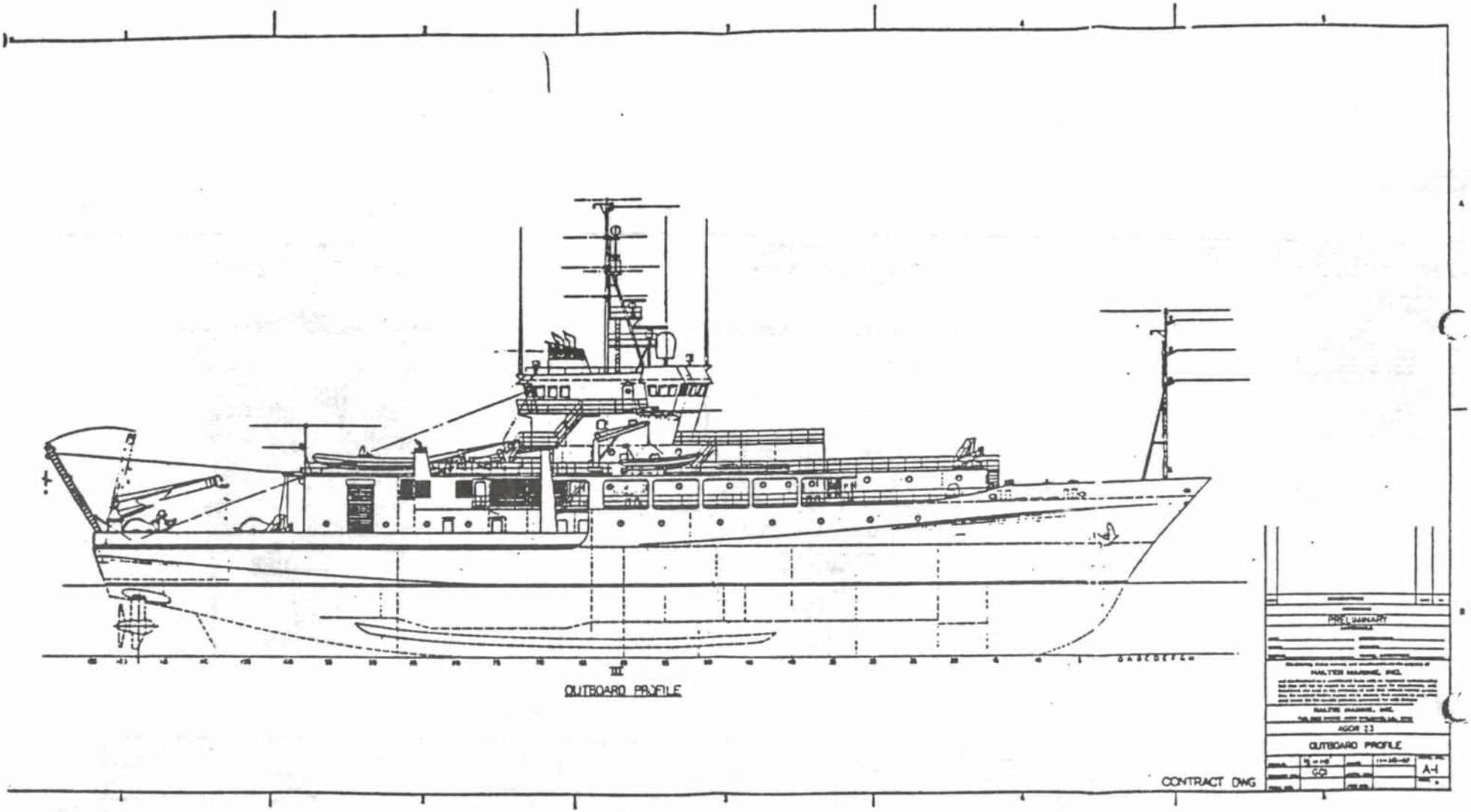
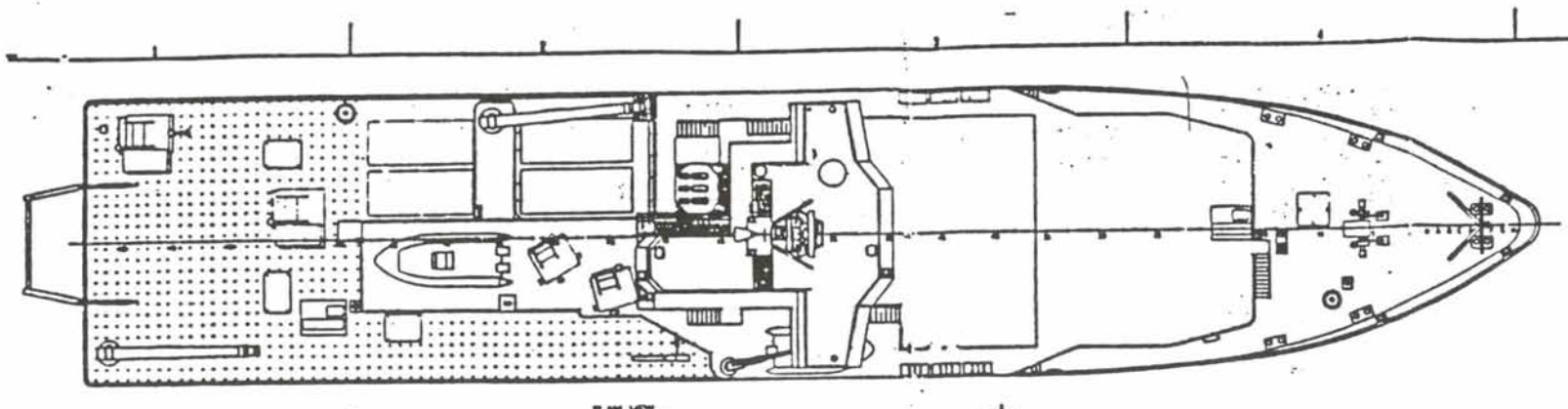
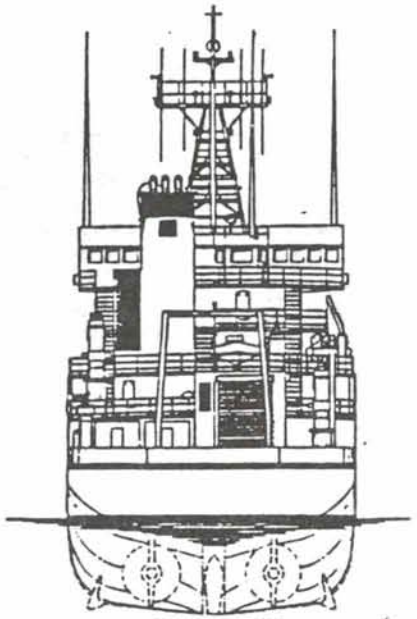


FIGURE I.1.1.2-1
GENERAL ARRANGEMENT
OUTBOARD PROFILE



PLAN VIEW



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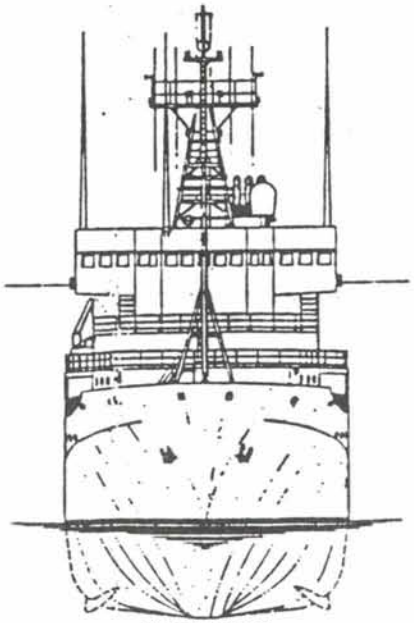

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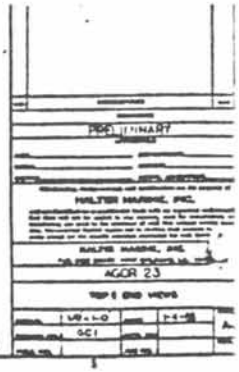
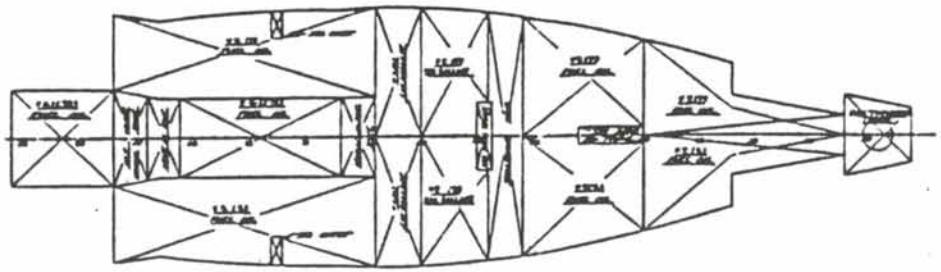


PRELIMINARY

AGOR 23

FIGURE I.1.1.2-3
GENERAL ARRANGEME
TOP AND END VIEWS



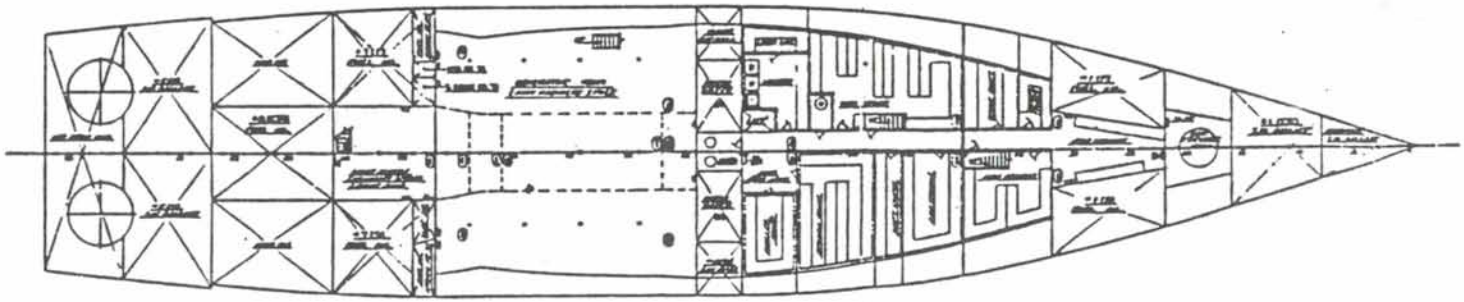


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FIGURE I.1.1.2-7
GENERAL ARRANGEMENT
DOUBLE BOTTOM, HOLD
AND TANK TOPS

TO: BOB DINSMORE
FROM: JACK BASH

SUBJ: LAY-UP AND MAINTENANCE POLICY

THE FOLLOWING IS A RESPONSE TO YOUR LETTER OF 30 SEP 88 RF. THE RVOC LAY-UP LETTER. THE ANSWERS ARE KEYED TO YOUR NUMBERED QUESTIONS.

1. IF STEP #2 DOES NOT HAPPEN IT WILL NOT SERIOUSLY IMPACT THE POLICY. IF STEP #4 DOES NOT HAPPEN WE SHOULD START OVER WITH THE POLICY. THIS IS THE BASIS ON WHICH THIS POLICY IS BUILT.

2. NO PROBLEM IN CHANGING THE OPTIMUM DAYS.

3. YES

4. THIS PERCEPTION IS DISTORTED SINCE EVERYONE DID NOT PREPARE THEIR SCHEDULE TO BE EVALUATED UNDER THE FORMULA (I.E., SEVERAL INSTITUTIONS DID NOT HAVE THE FUNDING INFO ON THEIR SCHEDULES AND THEREFORE FOILED THE TEST. IN ADDITION, SEVERAL SMALLER SHIPS FELL INTO THE OPERATIONAL CONSTRAINTS PART OF THE POLICY AND SHOULD NOT HAVE BEEN COUNTED.)

5. YES, HOWEVER AN APPEAL IS ALWAYS IN ORDER

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

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

September 30 1988

To: RVOC

Subject: Ship Lay-up and Maintenance Policy

The Chairman of UNOLS has asked the Advisory Council to review the Ship Lay-up Policy which RVOC developed at its last meeting. An ad-hoc Committee constituted as shown in the attached letter of July 19th is reviewing available information in order to report to the next Advisory Council meeting.

The RVOC Policy was circulated to UNOLS and generally received highly favorable reactions. There were, however, disappointly few written responses. What has been received to date is attached. Another circular is going out to UNOLS Members requesting comments.

I have asked Jack Bash to convene a working group at the forthcoming RVOC Meeting to go over these responses and determine what effect any of them might have on the existing policy draft. Special attention should be given to the following considerations:

1. What if either, or both, of RVOC Steps #2 and #4 were not available?

2. Should the "optimum" number of days be amemded?

3. Should a formal "Long-Range" layup/refit plan be established UNOLS wide?

4. Noting that at the July scheduling meeting, 17 of 24 Class II, III, and IV ships were lay-up candidates under the RVOC Policy, is Step #7 realistic?

5. Is Step #8 the final decision making process? Is it in "Open Forum"? Is there an appeal?

6. Other Considerations?

Jack has been asked to collect the comments of RVOC on the above for inclusion in a report to the Advisory Council.

Bob Dinsmore

R. P. Dinsmore

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

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

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(503) 754-3437

July 19, 1988

Jack Bash
Bob Dinsmore
Tom Malone
George Shor

Dear Jack, Bob, Tom and George:

Thank you for being willing to serve on an Ad Hoc Committee to provide a follow-up review of the RVOC White Paper dealing with Vessel Lay-ups and Maintenance. The RVOC put a fine effort forward on this issue, certainly better than we have seen before. Criteria for defining an effective schedule is very important. The formula in the White Paper has already been put to use by NSF, but can certainly use some refinement. Although comments on the RVOC White Paper were solicited from the UNOLS community, very few responded. There were, however, a number of important comments from Don Heinrichs and Keith Kaulum. I have enclosed here the original White Paper and the four sets of comments that were received.

There are obviously a good number of variables in dealing with this issue, with some of the major ones like federal commitment of maintenance funds being a tough nut to crack. It would be helpful to look at the expected life of the ships in the fleet and the prescribed rehab times as one point of reference to work from. Clearly, any proposed lay-up and maintenance plan needs to couple in the long-term perspective of the fleet. I am hopeful that with some serious effort and imagination an effective guide can be developed.

I have asked Bob Dinsmore to chair this committee, and he will take it from here. There are funds in the UNOL's office for you to hold a meeting if that is your wish.

I would like to have your recommendation in hand for the October meeting of the Advisory Council. Again, thank you for your assistance. I appreciate it very much.

Regards,

George

George H. Keller
Chairman

ms
Enc
xc: W. Barbee
A. Maxwell

RESEARCH VESSEL OPERATORS' COUNCIL

RVOC OFFICE
University of Rhode Island
P.O. Box 145
Saunderstown, R.I. 02834

Oct. 19, 1987

Dr. George H. Keller
Chairman UNOLS
Oregon State University
Research Office
Corvallis, OR 97331-2135

Dear George:

In your letter of 9 December 1986 you requested that RVOC develop a position paper on ship lay-ups. The following is that paper which has received the endorsement of the full RVOC at our meeting in New Hampshire 12-14 October 1987.

We believe that lay-ups will be a way of life for ship operators for the forseeable future. This is partly the nature of the business because of the need to maintain a complete inventory of oceanographic vessels with different capabilities and the inherent mismatch of funding and hull availability. Recent history suggests that science has not been left ashore for want of a research vessel and that one to two ship years of ship time can not be funded annually. The types and sizes of ships which come up short of science seems to change to some extent from one year to the next. The focus of science to different geographic areas also changes. Ship mobility can often compensate for this but not always. Some years ships with special capabilities (such as Seabeam) are overworked while other years specialized ships and/or equipment go unused.

An optimum number of operating days for the various size vessels has been developed. This optimum number provides the best mix of operating days and maintenance days for the most cost effective ship operations. We believe that an effort should be made to maintain an optimum number of operating days on all "fully" utilized ships. Our operating experience suggests that this optimum number is as follows:

Class I & II	270 Days
Class III	250 Days
Class IV	220 Days

(Note: Smaller ships and Class IV ships for which some operational constraints apply, such as many short cruises in a given year, may be exempted from the minimum day rule.)

These numbers seem to balance dollar inflow with operating patterns and adequate maintenance time.

Ship's schedules which have significantly fewer days than the optimum are candidates for lay-up. What constitutes "significantly fewer days" is an arbritrary number, however, 80% of the optimum would seem to be a reasonable working figure.

Lay-ups are only effective if funds can be saved. It is believed that anything less than three months is not a lay-up but an extended inport period. Ship lay-ups in excess of 12-14 months (cold lay ups) create another problem and that is major start up costs. This paper will only address lay-ups of more than three months but less than fourteen. This we call a "warm" lay-up. Cost savings increase with months of lay-up to the point of becoming a cold lay-up.

The management of the lay-up must vary with the monies available. There are fixed costs of approximately one third the total annual operating cost which must remain. This includes insurance, security and shore staff. Approximately a third of the costs can be saved outright such as fuel, travel and food. The variable cost savings is in the middle third and is made up of crew costs, maintenance and supplies. Managers vary in their approach to this middle third. Some would prefer to keep as many of the crew in tact and perform maintenance in house. The other approach is laying off the crew and contracting out maintenance work. In any case all or a portion of this middle third is highly desirable for preserving the integrity of the ship.

During the life cycle of a research vessel periods of major overhaul or refit are necessary. If a vessel has an expected life of thirty years it could logically have a mid life refit at about the 15-18 year time frame. With the advances in science and science equipment a major science refitting might be expected every 10 years or at the 10 and 20 year time. This suggests at least three major down periods might be expected in a ship's life cycle. These down periods could be worked into the lay-up planning.

Besides the major refits above, ships can use a rest for general maintenance. This could be a welcome respite from extended operations or a down time needed to repair or replace equipment. If maintenance money was made available for lay-ups they would become less distasteful and even welcomed.

Lay-ups have been traumatic partly because of the short notice given. This causes turmoil with the crew and prevents orderly maintenance planning. Learning of a lay-up in October for the following calendar year is not adequate warning. This has been known to be a problem for some time. In 1986 it was agreed that the lay-up decision would be made in July. In fact the decision came in October as in the past. The uncertainty of funded cruises plays a major part in this delay. Operators hang on in hopes that the August panel will provide funding for a goodly number of their cruises. In most cases this does not happen. The signs are normally clear in mid-summer with maybe 10-20% of cruises unfunded. This would suggest that ships with schedules including 60% or less of funded cruises will not likely "get well" with the August panel results.

Coupled with the short notice given is the long lead time necessary to properly engineer major repair work and then go through the full proposal process with its peer review. If this process does not start until October it is reasonable to expect that funding can not be made available until July or August of the lay-up year. Then it becomes difficult to get the work completed in the remaining time. Some of this time line can be shortened by advance planning. If all ships were encouraged to do advance engineering studies on a long range work package significant time could be saved. These work packages could also be reviewed by the ABSTECH or INSURV inspections. This process would assist the funding agencies with their priorities and probably cull out some of the plans. It could also streamline the proposal review procedure. Another idea to streamline the review process is to establish a review team for on site review. It would seem that any speed up in receiving upgrade money would be beneficial.

We believe the lay-up decision should be made based on an open forum discussion using logical criteria. The principal candidates in lay-up should be given the first opportunity to resolve the issue. If there were some assurances that upgrade funding would be made available it is likely that prospective lay-up operators would be willing to volunteer for lay-up.

The following procedures towards lay-ups are recommended:

Yr-15 mos 1) All institutions should be encouraged to establish a prioritized upgrade plan that has completed at least preliminary engineering.

Yr-12 mos 2) ABSTECH and/or INSURV should review these upgrades and make recommendations as to the viability of each item, possibly prioritizing the upgrade list.

Yr-8mos 3) Funding agencies advise the community as early as possible (Apr-Jun) as to the number of ship days that will be funded. The short fall can then be calculated.

Yr-6mos 4) Funding agencies pledge maintenance or upgrade funds for lay-up ships prior to 1 July.

Yr-6mos 5) Ships with light schedules in July become designated candidates for lay-ups. The following formula would apply:

Total Funded cruises scheduled	=	F
Total proposed but unfunded cruises scheduled	=	P
Optimum Days	=	0

$F + .33P \geq .8 \times 0$

This presupposes that only 1/3 of the unfunded cruises, in July, will be funded by the August panel.

Optimum days are:

Class I & II	270
Class III	250
Class IV	220

(See note on Page 2 about smaller ships)

Yr-6mos 6) Operators are now given an opportunity to volunteer for a lay-up.

Yr-6mos 7) Those operators in the lay-up candidate category now get together, without outside assistance, to attempt to resolve the ship day shortfall.

Yr-5mos 8) Chairperson of the East and West Coast scheduling groups plus the funding agencies resolve shortfall unanswered by 6 and 7 above.

4yr-4mos 9) Lay-up operator will circulate to active operators the resumes/vitae of all marine personnel who cannot be supported under anticipated lay-up funding. Active operators will make every reasonable effort to place these laid off personnel when vacancies occur and will co-operate in enabling them to return to the laid up operator when that vessel re-enters service.

Sincerely,

Jack

John F. Bash
Chairman RVOC

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL RESEARCH
ARLINGTON, VIRGINIA 22217-5000

IN REPLY REFER TO

5000
Ser 1121SP/10
9 February 1988

Dr. George Keller
Chairman, UNOLS
Oregon State University
Research Office
Corvallis, OR 97331-2135

Dear George:

As per your request, I offer the following comments regarding the RVOC Position Paper on ship lay-ups dated 19 October 1987.

Page 2, Paragraph 6:

Using refit periods as convenient lay-up periods sounds great, but we should remember that this is a period during which ONR is presently either replacing or doing major refits. When they are completed, it will be ten plus years before any of the large expensive ships require refits. Also, these refit periods are long shipyard programs when crew are of no value and must be layed off.

Page 3, Paragraph 1:

Funding agencies don't like "welcome respites from extended operations" because this most likely means paying expensive crew members including masters and chief engineers to do repair or refurbishment which could be more quickly accomplished by a shipyard. More importantly, in most cases the ship is being layed-up because the federal agencies don't have funds to operate the ship and are trying to save funds. Therefore, in most situations they don't have funds for repairs and refits. ONR has been an exception to this because we have had separate funds for refit programs.

Page 3, Paragraph 2:

The problem of not deciding on lay-up until late in the year is tough to solve. Obviously lay-ups could be more efficient and less traumatic if planned well in advance, but this is difficult to achieve for the following reasons:

- As discussed, the operators with thin schedules hang on past the July and even October scheduling meetings in hopes for the appearance of a miracle 100 day user. A good example is TAMU this year. They had a very weak schedule for GYRE in July and it had not improved in October. The scheduling committee said that it was weak, but no recommendation for a lay-up was considered, probably because Tex Treadwell made a big fuss last year when the committee did make a recommendation regarding the GYRE. I think the proposed test for a viable schedule on page four may be a practical means for the UNOLS scheduling committee to make lay-up recommendations since it becomes impersonal and quantitative.

- The other problem regarding early lay-up is that the funding agencies, particularly NSF, don't know their budgets in July, and now it's more likely to be January as a result of the slow congressional budget process. Even at this late date ONR doesn't have a firm budget and we are limited to 85% of the last adjusted value. This situation is now probably a way of life for federal agencies, including NSF, and any scheme to deal with lay-up should be able to accommodate budget uncertainty.

Page 3, Paragraph 3:

The general idea here is reasonable and I would support advance planning for major upgrades, however, the concept presumes that funds will be available which is unlikely to be true as I have discussed above.

Page 3, Paragraph 4:

I agree with the idea that lay-up decision should be based on "open discussion using logical criteria". I have yet to see this approach work well in the UNOLS scheduling process. It may be just too hard for the oceanographic facilities community to deal with such a threatening situation. As it is now, NSF usually waits until January, then makes a decision not to fund any time on the victim institutions ship, and spreads any residual time on to other ships schedules. This arrangement presents problems when NSF selects ONR owned ships and maintains a policy that the owner agency pays the lay-up costs. As you know, ONR and NSF have been negotiating this issue for some time, but as yet have not reached an acceptable resolution.

Pages 4 and 5, The Proposed Procedure:

Generally, the procedure appears to be OK except for two steps which I will comment on. In step 4 the funding agencies are asked to pledge maintenance funds for an unknown ship or ships in July. I don't know about NSF, but as the ONR Program Manager for Oceanographic Facilities, I am not prepared to make such a commitment. First, I don't know my budget at that point, and second my policy is to fund maintenance only on ONR owned ships. The eventual ship to be layed-up and receive funding could well be an institutionally owned ship. With a large portion of the fleet and a small budget ONR just can't afford to act as a patron for the entire UNOLS fleet.

Regarding step 7, I think this step would be improved if the lay-up candidates met together with the Scheduling Committee Chairmen and the results were then included in the report on the general scheduling meeting. If there is no progress, we would all know it very soon. Then when the follow up meeting (step 8) takes place a month later with the agencies, we would have good solid information available to all so we could potentially reach a funding arrangement for the necessary lay-ups.

I hope these comments will be of value to you in structuring a new process to schedule the UNOLS ships which effectively deals with the lay-up problem. You should note that lay-up of larger ships should not be a problem

for the next several years since KNORR and MELVILLE will be undergoing overhaul/refit programs and THOMPSON is expected to be retired in late FY-88. I am sure we will be discussing the whole issue, plus a few other items, at the next Advisory Council Meeting.

Best Regards,

Keith W. Kaulum

KEITH W. KAULUM
Program Manager
Special Projects

Copy to:
Code 112
Code 10P
UNOLS Office

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

DIVISION OF OCEAN SCIENCES
OCEANOGRAPHIC CENTERS AND FACILITIES SECTION

25 NOVEMBER 1987

Dr. George Keller
UNOLS Chairman
Research Office
Oregon State University
Corvallis, OR 97331

Dear George:

The following is my synopsis of the RVOC position paper:

- Research ship lay-ups will continue.
- Optimum operations are 270 days (Class I & II), 250 days (Class III), and 220 days (Class IV).
- Any ship with 80% or less of optimum schedule is candidate for lay-up.
- Lay-ups effective only if funds are saved.
- Lay-ups defined as 3-14 months out-of-service (warm lay-up).
- Life cycle of research vessel requires periods of major overhaul or refit.
- At least three major vessel and/or science equipment upgrade periods should be incorporated into lay-up planning.
- Lay-ups traumatic because of short notice for crew and maintenance planning.
- Advance plans should be required for major overhaul or refit of all ships.
- Lay-up decisions should be in open forum discussion using logical criteria.
- Principal candidates for lay-up should have first opportunity to resolve issues.
- Final solution by UNOLS ship schedule chairmen and funding agencies.
- Ships Layed-up!

cc Barbel
Bash

The "procedures" section of the report outlines a rigorous time schedule for commitments and decisions by federal agencies and UNOLS institutions. Overall the RVOC position paper builds on the existing UNOLS system by adding a "maintenance/upgrade" component during lay-ups.

I see a number of difficulties in making the RVOC model work with the present UNOLS committee structure and federal agency constraints. My thoughts and concerns include the following.

Annual maintenance/upgrade proposals

If I understand the report correctly, each institution would assemble in December/January a general maintenance and upgrade work package including ship and/or science outfitting. These would be reviewed and priorities established for each ship in the fleet every year. Funding agencies would pledge maintenance or upgrade funds for whatever ships are to be out of service. Funds flow later in response to scheduling decisions.

Major problems include:

- Annual proposal and review for all ships excessive work for lay-up problem.
- Ships are owned by different agencies and institutions. Unclear uniform policies can be established.
- "Pledge of support" may fall all on one sponsor.
- Maintenance and upgrades driven by scheduling not by long range fleet planning.
- Federal agencies do not have approved budgets by July.

I believe the basic concept behind much of this section of the report is sound, however. We need to develop procedures (and commitments) for long range planning of major overhauls, upgrades and refits related to the life cycles of the research ships. An integrated analysis of the overall fleet profile, required timing, etc. is needed to prioritize individual ships. With needs and priorities known, the candidate ships for refits can be identified before detailed scheduling is done. These ships should be scheduled for operation last.

Support Level Estimates

Funding agencies are to advise operators by April to June of number of ship days that will be funded. Ship days per se is the wrong measure -- too diverse mixture of possible ships, transits, non-UNOLS vessels, etc. to estimate specific number. The anticipated resources to support field operations i.e. the budget is the best predictor. NSF has provided UNOLS with budget estimates (updated as the budget cycle proceeds) for years. The UNOLS scheduling committees have routinely calculated "short-falls" and then waited for them to go away. If the RVOC procedures are to work, reasonable estimates of support from all sources are needed and the shortfall calculation has to be believed. This is the time sound recommendations on lay-up procedures are needed using logical criteria.

Schedule Resolution

I do not believe that "lay-up candidates" without outside assistance can resolve ship day shortfalls. This implies a closed system involving only those operations. The solutions must include options from the entire fleet.

Final Decisions

RVOC recommends UNOLS Ship Schedule Chairmen and funding agencies provide final resolutions. Two things are mixed here -- advice and management. The key issue is how is UNOLS as an organization is going to provide its final recommended set of actions -- actions, that will result in funds being saved by putting ships and personnel out-of-service.

This is a weak point in the present system. The Schedule Committee chairmen make recommendations now but they are not empowered to speak as the final voice of UNOLS. I doubt that many UNOLS institutions will be willing to delegate the final "lay-up authority" to the chairmen. Advisory Council role? UNOLS Executive Committee?

I am encouraged by the renewed effort to address the lay-up problem. The system at present retains too much emphasis on the mechanics of the scheduling process and not enough emphasis on overall resource allocations.

Sincerely,

Donald F. Heinrichs

Donald F. Heinrichs
Head

cc: E. Silva, ONR

INSTITUTE FOR GEOPHYSICS
THE UNIVERSITY OF TEXAS AT AUSTIN

Director • Austin, Texas 78713-7456 • (512) 471-4860

November 17, 1987

Dr. George Keller
Chairman UNOLS
Oregon State University
Research Office
Corvallis, OR 97331-2135

Dear George:

This letter is in response to the request for comments on the RVOC position paper on research ship lay-ups. First, I would like to comment on the overall policy. I think RVOC has done a first rate job in attacking a perennially tough problem. I like the basic assumptions they have made e.g., an optimun number of operating days for each class of ship, definition of "warm" lay-up, need for advance notice of lay-up, taking advantage of this time for overhaul, refit, etc., making the lay-up more attractive to operator and the development of logical criteria and a schedule for lay-ups. Consequently, my comments will only refer to some of the details rather than the overall concept.

The most important comment that I have is, that to make the plan work and to have it supported by the funding agencies, the plan really must save money when a ship is laid-up. I don't feel that it is reasonable to expect about half of the full operating cost for a ship in lay-up. Somewhere between a quarter and a third is more logical. This means, of course, that more drastic savings need to be taken in the insurance, shore-side support, security and crew costs. This should be the situation for a ship requiring only limited work. If the ship requires major overhaul, the cost of that needs to be added to the above amount.

cc Bash
Barber

Next comment is that all UNOLS ships should be considered in such a plan. There should be developed a long-term overall schedule that includes all ships, so that it is clear well in advance which ships will be laid-up. Not only would this keep some ships from being laid-up an abnormally high percentage of the time, but it would be viewed as a fair procedure that equally affects all. If this were done, then items 5 and 6 of the procedures would need to be revised to reflect there is a natural schedule that needs to be given consideration along with a calculated formula and volunteers.

If the above considerations could be worked into the plan, I feel it would receive more support from both the community and funding agencies.

Lastly, I would like to compliment RVOC on what they have come up with and I hope the community can pull together to get something like this into operation.

Sincerely,

cc W. Mitchell

Posted: Fri Nov 13, 1987 1:12 PM EST Msg: BGIH-3231-8960
From: D.MENZEL
To: G.Keller
Subj: ROVC document

I have 2 comments related to the criteria suggested by RVOC to help identify UNOLS vessels that may be candidates for lay up and refitting. These are: 1st.--(for fun and games only)--The suggested number of "optimum" operating days for the various classes of ships range from 220-270. This leaves 95-145 days in port, figures which could increase to 146-189 if the suggested formula is applied. All figures exceed those used to define "extended inport periods" (3 months). Thus, if strictly applied all "fully used" UNOLS vessels could be candidates for lay up. The term "extended inport periods" obviously means in one stretch. This is ok but sure invites other games-eg.-a four month cruise with one day cruise every 28 days thereafter?

2. It may be a mistake to couple lay ups with upgrading and refitting (last sentence pgs 3). Seperate criteria should be developed for each. Light schedules result from a lack of need whereas the need for refits and upgrading should relate directly to need. Only in accidental cases will the two apply to the same ship at the same time. Long lead time planning for refits/upgrading, similar to that proposed, is a manditory requirement for proper management. The lead times suggested, however, seem much too short. This type of planning should be looking ahead at least 3-5 years. Scheduled refits could then be coupled with the scheduling of active ships using a much shorter time frame for the latter (1 yr?) This, of course, is something UNOLS has done quite efficiently for many years. It also could be argued, with some justification, that the UNOLS fleet should include 1 or 2 ships formally designated and operated as "rotaters". These ships could be scheduled a year or two in advance to substitute for vessels in line for refit (if the 15 year midlife refit is adhered to 1+ ships/yr will not be available for research purposes), those tied up on extended cruises, or when the requirement for frequent short cruises collides with other proposed uses. The availability of "rotaters" could also help relieve the problem, which is certain to come up, when refits are required on ships at institutions with a one ship operation. Assuming an adequate budget for ship ops and refits (feds) such an arrangement could also relieve the problem of "surplus ships".

Have fun, you've latched on to a tuffie especially if others who respond mix up, as I have, what can be expected from RVOC and what is properly left to the AC.

UNOLS PORT GUIDE

PORT NAME: Sausalito, California/San Francisco Bay Area

COUNTRY: USA

BERTH/PIER: U.S. Army Corps of Engineers

Contact Name and Address: Daphne Derven, Manager
or Nancy Rodgers, Asst. Mgr.
The Bay Model Visitor Center
U.S. Army Corps of Engineers
San Francisco District
2100 Bridgeway
Sausalito, CA 94965
ph.(415)332-3871

Approach Restrictions: Sausalito is located in Richardson Bay on the SE end of the Marin Peninsula. Upon entering San Francisco Bay and passing under Golden Gate Bridge, vessel should proceed at medium speed approaching day mark #2. Day marks indicate main channel by 150' offset to the SW where the main channel lies. Proceed in main channel at min. speed due channel depth & width.

Channel Currents: Ebb and flood currents are usually parallel with channel. Some strong westerly set at ebb.

Winds: Usually out of NW in summer, and SW in winter.

Weather Conditions: As per San Francisco (seasonal). Less thick fog within Richardson Bay.

Channel Depth: Recommend arrival and departure on at least +4' tide or MLHW. Average control depth approximately 18 ft. at MLLW; approximately 7' range.

Dock Approach: Many small to medium sized boats anchored in turning basin. Main channel is usually clear. Day Beacons are lighted, however, recommend daylightarrivals/departures. Make wide turn before #6 day beacon. Berth is located on south end of dock. As of this writing, large steam schooner WAPAMA with yellow canopy docked on north side of dock. Bollards/cleats for mooring located at 50'intervals.

Services: Corps of Engineers very helpful; plenty of storage/warehouse space. With proper and early notification will arrange use of forklift (5000 lb) 4' forks, inside and/or outside storage for short periods (30 days or less).

Communications: Channel 16. Call M/V RACCOON or M/V COYOTE will

relay messages to Bay Model via cellular phone. Contact limited to within S.F. Bay only.

Vendors:

Laundry--

Ship's Laundry of Oakland.
Phone: 415/530-8300 (good service).
(Buck Jordan)

Ship's Chandler--

West Coast Ship Chandlers
P.O. Box 77564
San Francisco, CA 94107-1981
Phone: 415/495-5400
FAX: 415/495-6147 (Eric Van Muers)

Fuel--(via truck)

Bay Cities Oil Co. (Chevron dealer)
P.O. Box 1749
Richmand, CA
Phone: 415/232-5956
(Jim Stewart)

International Marine Fuels of S.F.
P.O. Box 77166
2121 3rd St.
San Francisco, CA 94107
Phone: (415) 552-9340
(Jeanne Kostiuk/John Santana)

Exxon: 415/552-9340
Chevron International: 415/894-7027
(Art Dunn)

Agent--

Kerr Steamship Co. (Jules Hall)
221 Main Street 16th Floor
San Francisco, CA 94105
Phone: 415/764-0200

Motels:

Alta Mira Motel (1 mile)
415/332-1350
$60 to $150+/night

Casa Madrona (1 mile)
415/332-0502
$100 to $200+/night

Howard Johnson (2.5 miles)
Shoreline Highway, Mill Valley
(800) 654-2000

Air Connections: Best through SFO. Either rent a car or take shuttle bus to downtown Sausalito.

Driving, take 1Ø1 N across Golden Gate Bridge. Exit at 2nd Sausalito exit to Marinship Drive. After 6-7 blocks, make a left then a quick right to Bridge Way (runs parallel to Marinship). ACE will be on left (large brown buildings).

Equipment: Big 4 Rents for forklifts, etc. Phone: 415/924-4444 (Corte Madera).

R&R: Several restaurants and clubs within walking distance toward downtown (south of facility). There is a ferry from Sausalito to San Francisco running during regular working hours.

Last visit - 7/26/88. R/V WECOMA. Dr. Michael Kosro, PI (OSU) CTZ.

OCT 17 19[illegible]

RESEARCH VESSEL OPERATORS' COUNCIL

RVOC OFFICE
University of Rhode Island
P.O. Box 145
Saunderstown, R.I. 02834

Oct. 13, 1988

Mr. Donald F. Heinrichs
Division of Ocean Sciences
Oceanographic Centers and
Facilities Section
National Science Foundation
Washington, DC 20550

Dear Don:

In your letter of 19 July 1988 you task the RVOC to develop additional guidance for institutions to provide responsible management and prevent future incidents aboard academic research ship re illegal drugs. We spent considerable time at our Seattle meeting discussing this subject including input from attorney Dennis Nixon. The thrust of the discussion followed that we were all believers in serious drug control and would police our ships with vigor. There was a sense that we should not impose extreme or unrealistic measures and that each institution had to temper their response to local conditions and their respective state laws. There was much discussion concerning the operators being able to have full cooperation of the scientific community. We all felt a tough stance was necessary.

The council developed the following statement (with minor editing by me) as the RVOC position.

RVOC Zero Tolerance Policy

The RVOC supports a zero tolerance policy towards drugs and strongly encourages each operating institution to establish practical procedures, within the guidelines of Federal and State laws, to ensure a drug free environment.

Procedures should include but are not limited to:

a. Establish a base-line "clean ship"
b. Ensure full awareness by the crew and scientific party of the institutions drug policy.
c. Train crew members on drug awareness
d. Post "Zero Tolerance" notices about the ship.

If you want additional input the RVOC stands ready to assist.

Sincerely,

John F. Bash
Chairman RVOC

cc: J. Williams

IRELAND CONSULTING SERVICES, INC.
58 Northbriar Drive
North Kingstown, Rhode Island 02852

Marine Operations and Safety

Captain George F. Ireland
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Telex 710110103:

Summary of Legislative and Regulatory Activity

prepared for

Research Vessel Operators Council

1988 Annual Meeting

10/88

APPENDIX VII

TABLE OF CONTENTS

INTERNATIONAL MARITIME ORGANIZATION

Three International Conferences will take place at the IMO headquarters in London, England during the two week period beginning October 31st. These will take place the week following the week log session of the 56th session of the of IMO's Maritime Safety Committee, during which much of the last minute preparatory work will take place. The Conferences are:

Conference of Contracting Governments to the International Convention for the Safety of Life at Sea, 1974 on the Global Maritime Distress and Safety System, 1988. (GMDSS Conference)

Conference of Parties to the Protocol of 1978 relating to the International Convention for the Safety of Life at Sea, 1974 on the Global Maritime Distress and Safety System, 1988. (GMDSS-P Conference)

International Conference on Harmonized System of Survey and Certification, 1988. (HSSC Conference)

Assuming that agreement is reached during the conferences, the work accomplished can be expected to take the form of International Conventions which then must be adopted by a sufficient number of member nations to come into force internationally. Those international standards are then implemented by being placed in domestic regulations.

Technical work to be considered during these conferences includes:

Implementation of GMDSS

Harmonization of Load Line and SOLAS requirements

Implementation of other technical standards, many stemming from the capsizing of the Herald of Free Enterprize

Implementation of the Global Maritime Distress and Safety System

Implementation of this system takes advantage of satellite communications, namely Inmarsat and Cospas-Sarsat. It will require new communications equipment aboard ships, with ships sailing the farthest distances offshore needed the most sophisticated equipment.

See the attached enclosures for the technical equipment envisioned and application of specific equipment to areas of operation.

Highlights of the GMDSS include use of Digital Selective Calling, 406 MHz EPIRBS, and world wide implementation of Navtex.

At issue is the future of Radio Operators at sea, and the time schedule for implementation. With regard to Radio Operators, some countries want to keep them aboard ships as radio/electronic maintainers, while others feel having duplication of equipment aboard ship should satisfy that need. A third position would be a scheme to allow either, or some combination of both. That will be decided during the conference.

Timeliness of implementation is another issue, with developing countries, in general, wanting a longer phase in period that other countries. At the last session of the Maritime Safety Committee, it was decided that the requirements for Navtex and satellite EPIRBs be implemented by 1993, and existing ships otherwise be brought into compliance by 1 February 1999. A phase-in period beginning 1 February 1992 would allow ships to comply with either GMDSS or the existing requirements of Chapter IV of the SOLAS Convention.

Harmonization of Load Line and SOLAS Conventions

Harmonization of the Load Line and Solas Conventions has to do with time intervals for survey and certification. Load Line certificates typically are issued for a period of five years while Solas standards require drydocking every two years (for cargo ships). The envisioned scheme would establish five year cycles so that drydocking would be done twice in any five year period with no more than 3 years between any two dockings.

Herald of Free Enterprise

The Herald of Free Enterprise casualty served to generate some new standards as well as serve as an impetus to getting on with work already in progress. Standards to come from the conference is expected to include subdivision and damage stability requirements for new dry cargo ships including ro-ro ships, residual stability for passenger ships after damage, and improvements in the areas of instrumentation for certain watertight doors and emergency lighting.

The Conferences will be attended by hundreds of delegates from approximately 100 nations. As a consequence many of the standards expected to flow from the conference may differ from what was expected because of compromise, receipt of additional information etc. Therefore it is important that this activity be tracked so that we may participate also in the U.S. development of domestic regulations which follow the international work.

LEGISLATION

Commercial Fishing Industry Vessel Act of 1988

The Commercial Fishing Industry Vessel Safety Act of 1988, PL 100-424, became law on the 9th of September 1988. While it addresses certain commercial fishing vessels the Oceanographic Research Vessel community should take notice. The vessels addressed are similar to many ORVs in that they are uninspected.

This legislation requires fishing vessels, fish processing vessels, and fish tender vessels to be fitted with, among other items, an EPIRBs, when such vessels operate on the high seas, and in other cases go beyond the Boundary Line. High seas in this case I expect shall be defined as beyond the territorial sea, i.e. beyond the 3 mile limit.

The significance of this is that this is a more stringent requirement than contained in SubChapter U which requires an EPIRB aboard only ocean and coastwise vessels with a proviso that they are not needed for vessels having a route of only 20 miles from a harbor of safe refuge.

See also the regulatory section which explains additional requirements regarding EPIRBs aboard fishing vessels.

H.R. 4557

This is a bill "... to amend Title 46 USC, to require alerting and locating equipment on uninspected vessels, to provide for exemption of uninspected vessels from certain requirements of that title, and to increase penalties for violations of certain uninspected vessel requirements".

This would require each manned uninspected vessel operating on the high seas or beyond three nautical miles from shore on the Great Lakes to be equipped with the number and type of EPIRB as prescribed by the Coast Guard. I expect high seas to be defined as being beyond the three mile limit.

This bill should be followed as I expect it will have application to several ORVs. The bill was passed by the House on September 26, 1988 and has been sent to the Senate but has yet to be referred to a committee.

Marine Plastic Pollution Act of 1987

This is the implementing legislation for Annex V of the MARPOL Convention. The senate ratified the treaty on November 5, 1987 and the implementing legislation was enacted shortly thereafter. As a consequence of the U.S. ratification, the requirements were met for the treaty to enter into force internationally, which will occur on 31 December 1988.

Annex V, which deals with the prevention of pollution by garbage from ships, prohibits the disposal into the sea of all plastics, including but not limited to synthetic fishing nets and plastic garbage bags.

Further, there are additional standards to limit discharge into the sea of garbage which are as follows:

Outside of Special Areas: discharge must be at least 25 miles from the nearest land for dunnage and things that float, and not less that 12 miles from the nearest land for food wastes, bottles, etc. If food wastes are ground so they would pass through a 25 mm mesh, they may be discharged within three miles from the nearest land.

These standards are more restrictive for ships operating within special areas (The Mediterranean Sea, the Baltic Sea, the Black Sea, the Red Sea and the "Gulfs area").

The Coast Guard will implement these international standards into U.S. regulation. An advance notice of proposed rulemaking to this effect was published in the Federal Register on June 24, 1988.

REGULATION

Final Rules

Operating a Vessel While Intoxicated

33CFR 95 December 14, 1988

This final rule establishes intoxication standards, allows for chemical testing, states that refusal to submit to chemical testing can be used against a person in an administrative proceeding (such as a Coast Guard hearing), states that a person should not perform any scheduled duties within four hours of consuming any alcohol, provides for enrolling in rehabilitation programs, and requires that accident reports contain a statement as to whether there was alcohol or drug use by individuals directly involved in the casualty.

This rule is also significant in that it uses the term "marine employer" and gives that person certain powers with respect to dealing with this issue. Applying to foreign vessels in our waters as well as U.S. vessels it contains penalty provisions of $1,000 for civil penalty, and $5,000 criminal penalty or 1 year imprisonment, or both.

Vital System Automation

46 CFR 50, et al. May 18, 1988

This final rule revises technical standards for automation of self propelled vessels previously published as Navigation and Vessel Inspection Circulars and establishes a new 46 CFR part 62. It incorporates the SOLAS amendments on the same subject which came into force internationally in 1984.

Anyone operating an inspected vessel over 500 gross tons with reduced manning as a result of automation of machinery should review this rulemaking. It became effective August 16, 1988

Channels 13 & 16, Great Lakes

47 CFR 80 May 13, 1988

This final rule establishes Channel 13 as the bridge to bridge channel on the Great Lakes and will become final upon concurrence Canada and notice is published in the Federal Register. The Vessel Bridge to Bridge Radiotelephone Act did not apply to the Great Lakes because of a separate agreement which established channel 16 to serve bridge to bridge communications as well as the distress, safety, and calling frequency. This change will relieve much congestion on channel 16 in the Great Lakes and bring that area into conformance with the rest of the U.S.

Assistance Towing Licenses

46 CFR 10 & 15 May 24, 1988

This final rule establishes specific licensing, and manning requirements for all vessels regardless of size, which engage in towing a disabled vessel for consideration. This license will establish minimum regulatory requirements for persons who engage in assistance towing. The license endorsement is applicable to all licenses except operator of uninspected towing vessels and master or mate licenses authorizing service on inspected vessels over 200 gross tons. This follows the Coast Guards recent change in policy where, in certain situations, utilization of commercial assistance is mandated as opposed to the Coast Guard providing the assistance. This rule became effective on September 15th.

Posting Requirement for Placard of Lifesaving Signals and Breeches Buoy Instructions, Form CG-811

46 CFR 35, 78, 97, 108, 167, and 196 May 24, 1988

This final rule eliminates the posting requirement for this placard but says however, that it must be readily available to the deck officer of the watch and became effective on July 22, 1988. So, after many years these old placards, like the "Atomic Attack Instructions for Merchant Vessels in Port", can come down from the bulkheads of enginerooms, messdecks and pilothouses, provided the deck officer of the watch has one readily available.

Emergency Position Indicating Radio Beacons for Uninspected Fishing, Fish Processing, and Fish Tending Vessels

46 CFR 25 August 17, 1988

This final rule implements a statutory requirement from the Coast Guard Authorization Act of 1986. As noted above, the Commercial Fishing Industry Vessel Act of 1988 has more recent requirements for EPIRBs as well as other safety requirements. This rulemaking requires an EPIRB aboard certain fishing vessels whenever on the "high seas". EPIRBS must conform to FCC Category one or 121.5/243 MHz Class A requirements. The Class A EPIRBs are acceptable if aboard the vessel prior to October 3, 1988 and must be replaced by the Category 1 type by August 17, 1994. This rule becomes effective on October 3, 1988.

The Category 1 EPIRB functions on 406 Mhz and will become the standard.

RULEMAKINGS IN PROGRESS

State Marine Accident Reporting: Accident Report Thresholds

33 CFR 173 & 174 April 25, 1988 and June 10, 1988

This Notice of Proposed Rulemaking by the Coast Guard proposed to increase the threshold for the reporting of vessel accidents involving only property damage from $200 to $400. The period for public comment was to end on June 24, 1988 but was extended to July 25, 1988. The NPRM asked for additional comments regarding further increases to the reporting threshold. The next step in the process should be final rulemaking.

Vessel Piping Systems

46 CFR 50, 56, and 61 May 18, 1988

This Supplemental Notice of Proposed Rulemaking by the Coast Guard was published the same day as the technical rules for automation of vital systems and is a supplement to a Notice of Proposed Rulemaking published on March 21, 1985. The significant part of this rulemaking is that it would remove the procedure whereby manufactures file affidavits for materials with the Coast Guard and in its place the Coast Guard would accept compliance with accepted industry standards. As a result shipbuilders, ship repair people, etc. would be able to use any piping system component, for example, if it were stamped or otherwise labeled with an accepted industry standard. The comment period ended on July 18, 1988. The next step in the process should be publication of final rules.

Licensing of Pilots; Manning of Vessels-Pilots

46 CFR 10 & 15 June 6, 1988

This Supplemental Notice of Proposed Rulemaking would amend regulations to delineate when certain inspected vessels are required to be under the control and direction of a pilot, set forth a procedure for designating waters which require federal pilotage, allow licensed persons to serve as pilot in certain cases, and set new standards for pilot of tug barge combinations. This is a change to an original proposal of June 24, 1985.

The issue of which waters require federal pilots has always been confusing because they are not published or indicated on charts. This proposal would charge each Coast Guard OCMI with making that determination. Presumably such a list then could be published. The remainder of the proposal then discusses application of federal pilots aboard certain inspected vessels, and examination, qualifications and procedures.

Like most rulemakings having to do with personnel, this is fairly lengthy and technical.

The period for public comment ended on September 6, 1988 The next step is publication of a final rule.

Regulations Implementing the Pollution Prevention Requirements of Annex V of MARPOL 73/78

33 CFR 151 & 158 June 24, 1988

This Advance Notice of Proposed Rulemaking by the Coat Guard solicited input from the public regarding implementation of Annex V (Garbage) to the Marpol Convention. It sets forth very good explanations of the technical requirements of the Annex and is a good source document in that regard. The Coast Guard needs to set up a system which insures that there are adequate reception facilities ashore for ships, as it did for waste oil, much of this advance notice is devoted to that issue. The period for public comment expired on July 25, 1988. The Coast Guard is expected to meet the legislative mandate for compliance and have final rules in place by December 31, 1988. The next step should be publication of a Notice of Proposed Rulemaking.

Programs for Chemical Drug and Alcohol Testing of Commercial Vessel Personnel

46 CFR 4, 5 & 16 July 8, 1988

This Notice of Proposed Rulemaking by the Coast Guard proposes drug abatement programs which include periodic drug tests (urinalysis) as part of required physical exams, preemployment testing and random sampling programs for all marine employees, and post accident and reasonable cause testing. The post accident and reasonable cause testing would also test for alcohol use. Four options are proposed for individuals who are detected as drug users for the first time. An 'implied consent' provision is proposed for seaman employed on vessels where their licenses or seamen's papers are required. Comments were to be received by September 6, 1988. Public hearings were later scheduled in Houston, Chicago, Washington, D.C. and San Francisco during August. The next step is publication of final rules.

Amendment of the Maritime Services Rules to Permit Noncommercial Communications on VHF Channels 79 & 80

47 CFR 80 July 25, 1988

This proposed rule by the FCC would allow noncommercial use (by recreational boaters) of channels 79 and 80 as a means to relieve congestion on other non commercial frequencies. It began a need for the Great Lakes region and subsequently published to apply nationwide. The comment period ended on 8 September 1988. The next step is publication of final rules.

Maritime Distress and Safety Communications

Dan Lemon

Introduction

In maritime safety, as in many areas of our lives, good communications are vital to success. They are also a central component of the Coast Guard's national search and rescue (SAR) system. When communications are inadequate or unreliable, our missions become inherently less efficient, less effective, and less safe.

Before Marconi invented the radio in 1895, the telegraph -- which depended on cables and wires to function -- was the primary means of transmitting messages. With the advent of radio, messages, including safety-related information for ships, could be transmitted more quickly and over great distances without connecting wires. While other ways of calling for help at sea exist, the radio has been the primary means of maritime alerting for many years.

The first recorded use of the radio for saving lives at sea occurred in March 1899 when the lightship **Goodwin Sands** near Dover, England, reported that the steamer Elbe had run aground. A dispatched lifeboat was able to rescue the crew. Again in January 1900, the Russians sent a radio message to an icebreaker which then rescued some fishermen trapped on an iceflow in the Gulf of Finland. In 1912, over 700 of those aboard the **Titanic** were saved because of a radio message received by the liner **Carpathia**. From these humble beginnings, the importance of radio communications to safety were quickly recognized; today, prudent mariners will not leave port without a radio.

Mr. Lemon is Chief of the Search and Rescue Liaison Branch in the Coast Guard's Office of Operations.

Search and Rescue Communications

Communications provide vital support to the Coast Guard's national SAR system by allowing

- those in distress to inform the SAR system of an emergency.
- the SAR system to respond and conduct its mission effectively.
- the survivors to help SAR units locate them and effect a rescue.

Besides monitoring for distress calls, communications are used by SAR forces for control, coordination, ship broadcasts, aircraft alerting, direction finding, and other miscellaneous purposes. Some rescue coordination centers use satellite communications where reliable land line systems are not available.

Advances in Technology

Figure 1 shows current carriage requirements from the 1974 Safety of Life at Sea (SOLAS) Convention, including two manually operated distress systems. Cargo ships over 1600 gross tons and passenger ships have to carry both radiotelephone and radiotelegraph equipment. Cargo ships between 300 and 1600 gross tons must carry at least the radiotelephone equipment. Radiotelephony on 2182 KHz and 156.8 MHz provides common distress communications for all ships. Morse telegraphy on 500 KHz requires a radio officer qualified in Morse Code.

Though the current international maritime distress and safety system has served us for over 50 years, it can be unreliable and labor-intensive. Since the range for currently specified shipboard communications equipment

Figure 1

Present (SOLAS 74) Carriage Requirements

Equipment	Radiotelephone Ships	Radiotelegraph Ships
Survival Craft VHF EPIRB	x	x
Portable Radio	x	x
VHF Radiotelephone (156.8 MHz)	x	x
Telegraph		x
Reserve Telegraph		x
Radio Keying Device and Auto Alarm Receiver		x
MF Direction Finder		x
Radiotelephone (2182 KHz)	x	x
Radiotelephone Auto Alarm	x	x
Receiver for Monitoring Distress Frequency	x	x

is 100 - 150 nautical miles, assistance can normally be arranged only with other ships in the vicinity.

The existing system can be improved by advances brought about by automation and satellite technology. For example, in 1962, Telstar, the world's first communications satellite, was put into orbit, permitting the first transmission of high quality speech instantly from one place on earth to another. The advent of radiotelephony, miniaturization, satellites, and other advances have all enhanced maritime capabilities.

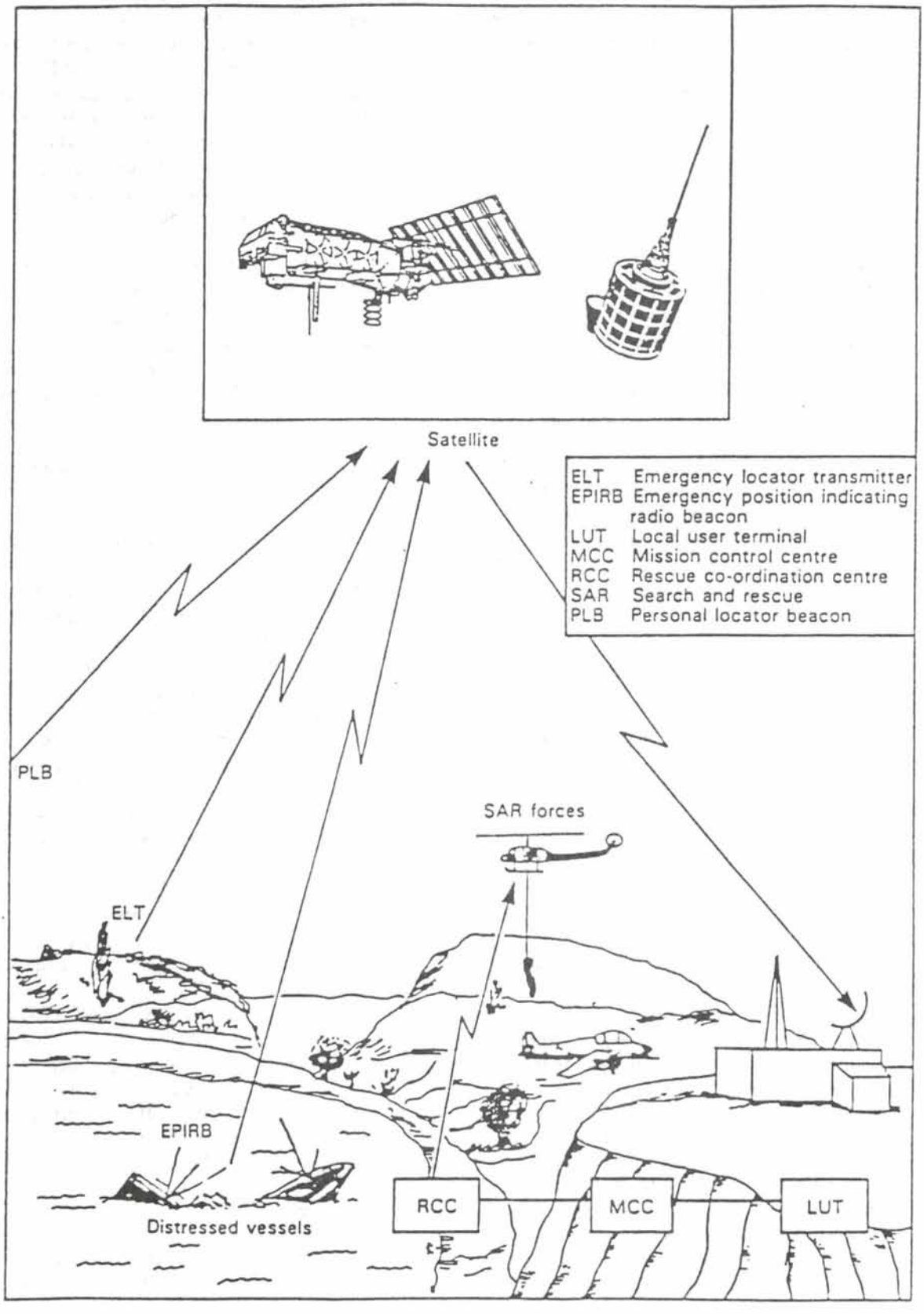
Satellite Systems for Safety and Distress

Two satellite systems, COSPAS-SARSAT and INMARSAT, are revolutionizing distress and safety communications. COSPAS-SARSAT detects, positions, and relays signals from aeronautical and maritime distress beacons to SAR authorities. INMARSAT provides two-way telex and telephone services and may eventually be used in additional ways.

An actual case can illustrate the usefulness of satellite technology to SAR. A Coast Guard rescue coordination center is advised by phone that a tug with two liberty ships in tow had broadcast a mayday, and its crew of 12 was abandoning ship 600 nautical miles southeast of Acapulco. Their coordinates were given with the mayday, and communications with the tug were lost thereafter. A search of the reported position by three nearby merchant ships yielded nothing. However, based on an emergency beacon position given via satellite, an air search located the vessel and crew the next morning 300 nautical miles west of the initial position they reported. Modern technology saved these lives, but not all cases have such happy endings.

Figure 2

Basic Concept of COSPAS-SARSAT System



COSPAS-SARSAT

Search and Rescue Satellite-Aided Tracking (SARSAT) began as an experiment that proved the concept of using polar-orbiting satellites and a ground network to detect and determine the positions of low-cost emergency beacons. SARSAT is a joint venture of the United States, France, and Canada. Within the United States, SARSAT responsibilities are shared among the Coast Guard, Air Force, National Aeronautics and Space Administration (NASA), and National Oceanographic and Atmospheric Administration (NOAA).

The system is now being operated jointly with the Soviet Union, which has a comparable system called COSPAS. Other countries, including the United Kingdom, Norway, Sweden, Finland, and Bulgaria, have since become COSPAS-SARSAT supporters.

COSPAS-SARSAT provides alerts and associated positions which are forwarded automatically to appropriate rescue coordination centers. Beacons compatible with this system include the existing 121.5 MHz Emergency Locator Transmitters (ELTs) for aircraft and Emergency Position-Indicating Radio Beacons (EPIRBs) for marine vessels. However, the system was designed primarily to be used with new 406 MHz beacons which will be discussed later.

The COSPAS-SARSAT space segment is a constellation of at least four polar-orbiting satellites that relay distress alerts to earth. On the ground, receiving stations called Local User Terminals (LUTs) receive and process the signals (see figure 2) to determine the position of the distress, and transmit the data to a Mission Control Center (MCC). The MCC sorts the alerts by geographic position and routes them nationally or internationally into the SAR system.

COSPAS-SARSAT functions in regional and global modes. In the regional (or real-time) mode, the LUT and the distress beacon must be simultaneously visible to the satellite. This mutual visibility exists when the beacon is within about 1500 nautical miles of a LUT. Both 121.5 and 406 MHz beacons can be processed in real time, but only the 406 MHz beacons can be processed in the global mode. The 406 MHz global mode is useful when an alert is transmitted from an area not covered by a LUT. In this case, the signal is stored aboard a satellite until the satellite passes over a LUT that can receive the data, at which time it is relayed to the ground system.

Figure 3 shows typical time parameters of a SAR case and how COSPAS-SARSAT can reduce the time required to rescue those in distress. The time between initiation of an alert, e.g., EPIRB transmission, and when SAR forces actually locate the distress is called the pre-rescue period, and can be generally broken down into the following time periods:

Notification (Alert): *Between initiation of EPIRB transmission and rescue coordination center notification. (Message transfer waiting time is portion of this period.)*

Planning: *Between rescue coordination center notification and SAR resource tasking.*

Transit: *Between resource tasking and arrival at search area.*

Search: *Between arrival at search area and sighting of distress.*

Shortening the overall pre-rescue period is critical in response to a distress since the life expectancy for survivors in the water can be extremely short. COSPAS-SARSAT can provide timely alerting, active position determination , and additional SAR information (with the 406 MHz EPIRB) that will permit reductions in the notification, planning, and search periods.

Several countries are interested in having a single, unified EPIRB that will operate through both polar-orbiting and geostationary satellites. While polar-orbiting satellites would provide global coverage and updated positions, geostationary satellites would provide more rapid alerting. COSPAS-SARSAT will be testing relay of 406 MHz signals via geostationary satellites in 1988 to help determine whether to add this capability to COSPAS-SARSAT.

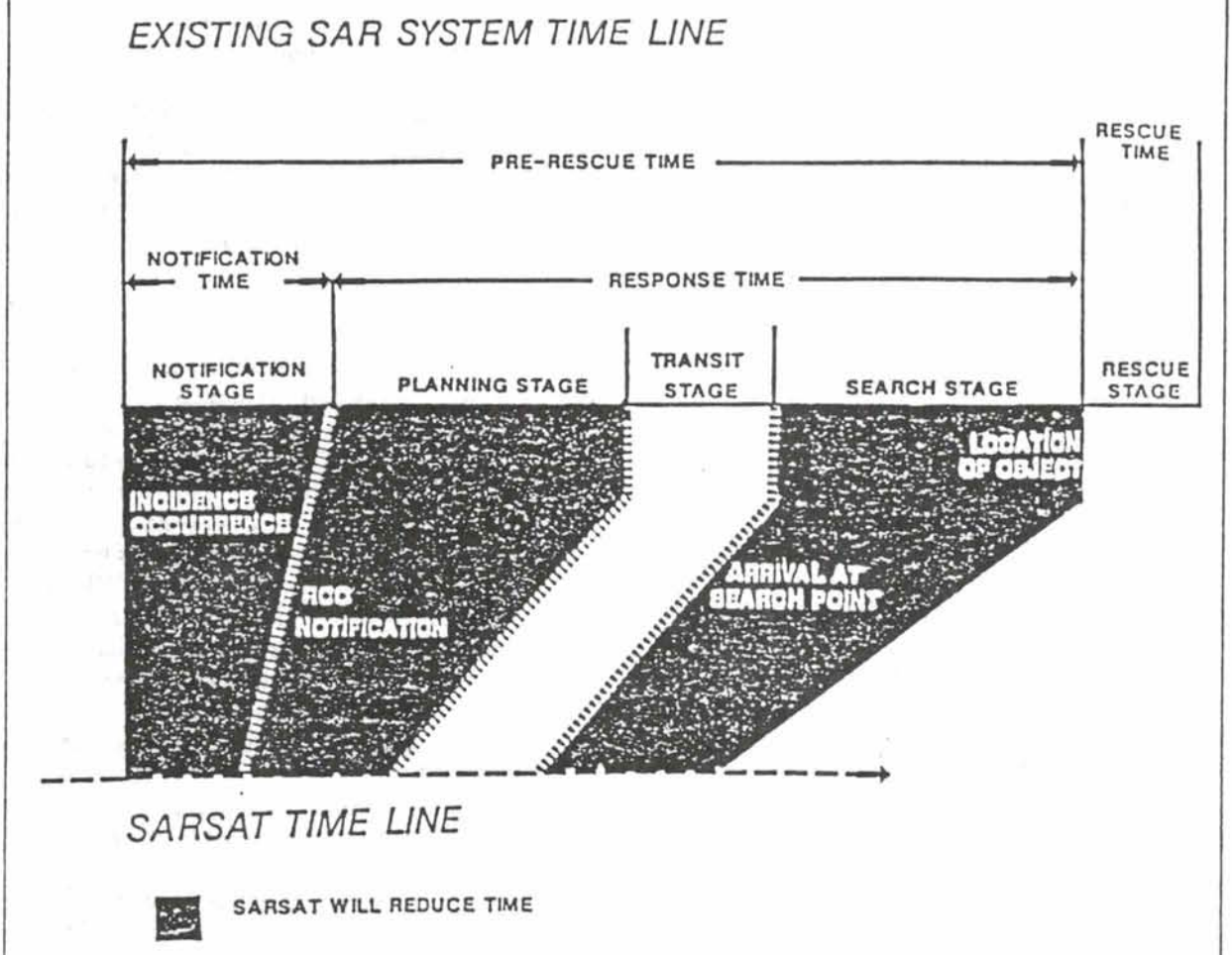
Before COSPAS-SARSAT, heavy reliance was placed on overflying aircraft to detect distress beacons. In the United States, COSPAS-SARSAT has tripled the number of beacon alerts detected. It is enabling the SAR system to save over 260 lives per year worldwide, about half of which are mariners.

INMARSAT

The International Maritime Satellite Organization (INMARSAT), headquartered in

Figure 3

Time Line of a SAR Incident



London, England, provides a maritime communications system space segment that works like an international telephone company.

While COSPAS-SARSAT relays EPIRB alerts with periodic position updates, SAR use of INMARSAT is mostly for coordination and prevention, e.g., meteorological warnings. Both may be used for identification of vessels in distress. INMARSAT provides instant, easy, reliable, and high quality maritime communications for commercial and safety purposes and could be adapted for automatic positioning via special EPIRBs that transmit position data.

INMARSAT has six geostationary satellites (two over each non-polar ocean region), 19 Coast Earth Stations (CESs) in 10 countries, and over 5000 Ship Earth Stations (SESs, 7000 expected by 1989). It now leases three satellites from COMSAT, a U.S. company, though soon it will be launching its own improved space craft.

The Coast Guard has land line access to INMARSAT CESs, and installations of SESs in rescue coordination centers of some countries are being considered where land line service is poor.

Figure 4 generally compares the COSPAS-SARSAT and INMARSAT systems.

Figure 4

Satellite Systems Comparisons

COSPAS-SARSAT

Primarily for distress beacons
Global coverage
One-way traffic
Printed output
One-hour average relay
Polar-orbiting constellation
90-minute orbit
1,100-mile altitude satellites

INMARSAT

Primarily for general communications
Coverage between 70 N and 70 S latitude
Two-way traffic
Printed output (voice optional)
Relay almost immediate
Geostationary over ocean areas
24-hour orbit
22,300-mile altitude satellites

Distress Beacons

Current Beacons

Marine EPIRBs and aviation ELTs are portable transmitters used for distress alerting and homing. The following three types of EPIRBs are currently used in the United States (ELTs and Class A EPIRBs are self-activating):

Class: A
Frequency: VHF AM 121.5 and 243 MHz
Regulations: Float-free; required on inspected vessels more than 20 nautical miles off shore
Detection: Satellite and high altitude aircraft

Class: B
Frequency: VHF AM 121.5 and 243 MHz
Regulations: Voluntary on vessels more than 20 nautical miles off shore
Detection: Satellite and high altitude aircraft

Class: C
Frequency: VHF FM CH 16, then shifts to CH 15 for locating
Regulations: Voluntary in coastal waters; required for certain vessels on Great Lakes; primarily for recreational boats
Detection: VHF shore stations

The reliability of ELTs and EPIRBs can greatly affect the potential usefulness of COSPAS-SARSAT; the beacons must reliably activate when appropriate, and not inadvertently send alerts when no distress exists.

406 MHz EPIRBs

New 406 MHz satellite EPIRBs and ELTs are being developed nationally and internationally specifically for use with COSPAS-SARSAT, and carriage requirements for EPIRBs are being revised. Several countries will begin using the new beacons soon. As of the end of July 1987, the United States has a new national standard for satellite EPIRBs and expects to have a similar standard for ELTs by April 1988. The Federal Communications Commission must amend regulations before beacons made to these standards may be used and is in the process of making this amendment for EPIRBs.

The combination of satellite beacons and satellite detection promises to be one of the few major improvements that have come to the national SAR system in many years. The 406 MHz units will be more detectable, offer improved ambiquity resolution (the ability to determine which of two positions given by COSPAS-SARSAT is true and which is its mirror image), be more accurate, include coded signal information, and have standard test procedures for type acceptance.

The new standards provide for three categories of satellite EPIRBs:

Category 1: Worldwide use where a float-free EPIRB is needed or required (operates 48 hours minimum at -20°C).

Category 2: Same as Category 1, except is intended for use where a manual EPIRB is appropriate or required (e.g., survival craft).

Category 3: Same as Category 2, except limited to use by ships which operate where 24-hour minimum alert signal life is acceptable (homing signal operates (48) hours), and air temperature is above 0°C.

Current unit cost estimates are between $1100-$1400 for Category 1, $900 for Category 2, and $700 for Category 3. The beacon categories are almost identical, except that the float-free capability increases the cost for Category 1 beacons, and the use of alkaline batteries (rather than lithium) decreases the cost for Category 3 units.

Some attractive reliability features of the satellite EPIRBs include:

- Strobe light -- transmitting indicator which aids visual homing;
- Controls --two simple actions required for activation, and float-free actuator can be disarmed (most false alerts from existing 121.5 MHz EPIRBs are due to inadvertent activation);
- Float-free -- designed and installed to minimize entrapment and icing failures;
- Batteries -- designed to prevent corrosion due to battery leakage;
- Signal coding -- provides SAR data to assist in early resolution of false alerts, and to expedite SAR response; and
- Buoyancy/stability -- requirements help ensure beacon stays on water surface and points the antenna to the sky.

Global Maritime Distress and Safety System (GMDSS)

Origin

In April 1979, in Hamburg, Germany, a conference of experts convened to draft the International Convention on Maritime Search and Rescue, the primary basis for an evolving global SAR Plan. The Plan will help ensure that (1) a designated rescue coordination center will be available to coordinate SAR efforts for mariners in distress wherever they sail and (2) nations will cooperate to conduct SAR operations as efficiently and effectively as possible.

Since the Conference realized that more reliable communications were needed and were becoming available, it recommended development of GMDSS to support mariners and the SAR system. It will enable a ship, regardless of where it operates, to perform functions considered essential for the safety of that ship and of others in the same area. It will support all necessary SAR communications -- ship-to-ship, ship-to-shore, and shore-to-ship. GMDSS is expected to dramatically improve safety at sea by providing rapid and reliable distress alerting, and by enhancing the way SAR missions are carried out.

As work on GMDSS began, some problems with existing maritime communications were identified:

- Congestion due to inadequate numbers of radio channels.
- Poor quality radio messages due to atmospheric and other phenomena.
- Long delays in receipt of distress alerts and medical advice.
- Limited range of conventional communications.
- Vanished ships without a trace or a successful call for help.
- Uncertainty about receipt of transmitted messages.

Capabilities

In contrast to our current system, it was decided that GMDSS should:

- Achieve alerting and locating with minimal delay.
- Provide automatic alerting and transmission of essential information.
- Provide a reliable network for SAR communications.
- Integrate terrestrial and satellite systems.
- Provide adequate frequencies in all maritime bands.

In GMDSS, primary distress alerting will be ship-to-shore rather than ship-to-ship. SAR will be coordinated by specially trained personnel and better awareness of available SAR resources. GMDSS was developed mainly for "convention ships," with the view that other vessels will participate on a voluntary basis.

Seven basic functions have been identified for GMDSS. Incorporation of COSPAS-SARSAT and INMARSAT into GMDSS made some of these functions attainable.

Alerting:

A vessel must be able to rapidly and reliably report a distress situation to a unit that can provide or coordinate assistance. Using either satellite or terrestrial communications, an RCC would then relay the alert to selected SAR units or other ships in the vicinity. Distress alerts will normally be sent and acknowledged manually, but a float-free satellite EPIRB will automatically activate if the ship sinks.

SAR Coordination for Rescue Coordination Centers:

The rescue coordination center must be able to coordinate SAR efforts with other rescue coordination centers and with vessels or aircraft conducting on-scene searches.

SAR Communications On Scene:

Vessels and aircraft involved in SAR operations must be able to communicate with each other and with the vessel in distress.

Transmit and Receive Signals for Locating:

Locating signals help locate the vessel in distress or its survivors with direction-finding equipment and will include use of 9 GHz transponders which interact with the radar of assisting units.

Dissemination of Marine Safety Information:

This includes automatic reception by ships of important meteorological, navigation, or other urgent information via direct-printing telegraphy or INMARSAT.

General Business Communications:

These communications between the ship and a shore-based communications network may affect its safety. Ordering charts or tugs are examples of this system's use.

Bridge-to-Bridge Communications:

These intership communications assist in safe ship movements.

Distress and safety calling in GMDSS will use Digital Selective Calling.(DSC). DSC is a technique which enables a radio station to contact and transfer information to another selected station or group of stations which will automatically receive the call. The transmitting station and purpose of the call will be identified and displayed. If the incoming call is distress or safety-related, an audible or visual alarm (or both) will activate on the ship's bridge. The Coast Guard has begun evaluating this system in the Hawaii area.

GMDSS vessels will also be equipped with special units called NAVTEX receivers. These units will make navigation information immediately available on the bridge to those responsible for safe navigation . NAVTEX provides automatic reception of marine safety information by means of direct-printing radio telex. The Coast Guard will be using NAVTEX and other means in lieu of 500 KHz to disseminate marine safety information.

Areas of Operation

A vessel must be able to perform the seven basic GMDSS functions, particularly distress alerting, regardless of where the vessel might sail. Several geographic operating areas were defined so GMDSS carriage requirements could be tailored to the actual equipment needed to communicate to shore:

A1 Short Range -- Within range of shore-based VHF FM station (about 20 nautical miles).

A2 Medium Range -- Within range of shore-based MF stations (300 -3000 KHz) excluding area A1 (about 100 nautical miles).

A3 Long Range -- Geographic limits defied in INMARSAT coverage area, excluding areas A1 and A2 (approximately between 70°N and 70°S).

A4 Long Range -- Remaining sea areas outside areas A1, A2, and A3.

Generally, ships that sail only in area A1 must carry VHF equipment; A2 ships must carry VHF and MF equipment; A3 ships must carry VHF, MF, and HF and/or satellite equipment; and A4 ships must carry VHF, MF, and HF equipment. All ships must carry satellite EPIRBs (VHF EPRIBs optional for area A1), a NAVTEX receiver, and a locating device.

Fisheries and Oceans Canada
Management Services Branch
Marine Division

Pêches et Océans Canada
Direction des services de gestion
Division de la marine

L. A. H. Fitch

Superintendent, Marine Operations

Surintendant, Opérations maritimes

Canada

MARINE DIVISION OF F & O REPORTS TO MANAGEMENT SERVICES DIRECTOR IN VANCOUVER. WE DO HAVE A FUNCTIONAL REPORTING TO SHIP BRANCH IN OTTAWA - WHO RESPOND TO NEW VESSEL ACQUISITION OR OTHER MAJOR EXPENDITURES BEYOND THOSE OF THE O & M BUDGET.

RESPONSIBLE FOR THE LEGAL, SAFE AND EFFICIENT OPERAITON OF THE REGIONAL FLEET SCIENTIFIC/HYDROGRAPHIC AND SURVEILLANCE/ ENFORCEMENT VESSELS. - 37 PLUS.

THSE RESPONSIBILITIES INCLUDE SEARCH AND RESCUE ACTIVITIES IN ACCORDANCE WITH NATIONAL SEARCH AND RESCUE PLAN, PLUS THE MANAGEMENT AND OPERATION OF MARINE REPAIR DEPOTS AT ~~SIDNEY~~ Patricia Bay AND PRINCE RUPERT.

MARINE DIVISION RESOURCES TO ACHIEVE THIS PRESENTLY ARE:

P/Ys	-	292
O & M	-	5,892.3 K
CAPITAL	-	454.5 K

THE SCIENTIFIC VESSELS COMPRISE 4 MAJOR VESSELS, 2 MINOR VESSELS, 38 LAUNCHES AND SMALL CRAFT, 2 BARGES AND THE SUBMERSIBLE PISCES IV & ROV. CSS JOHN P. TULLY & 227; PARIZEAU 222; PISCES IV 2000 M AND ROV UP TO 5000 M NOT TRIALED YET.

JOHN P. TULLY - 69M (230) - G.T. 2199 - RANGE 12,000 - SERVICE SPEED 12 KNOTS - COMPLEMENT OF 42 - BUILT 1983 - COST 26M.

PARIZEAU - 64.5M (212) - G.T. 1314 - RANGE 12,000 - SERVICE SPEED 12 KNOTS - COMPLEMENT 43 - BUILT 1967 - COST 4.2M.

VECTOR - 39M (130) - G.T. 516 - RANGE 3,700 - SERVICE SPEED 10 KNOTS - COMPLEMENT 23 - BUILT 1957 - COST 2.5M

RICHARDSON - 20M (66) - G.T. 59 - RANGE 2,000 - SERVICE SPEED 10 KNOTS - COMPLEMENT 6 - BUILT 1962 - COST 100K

RICKER - 58M (223) - G.T. 1,104 - RANGE 12,000 - SERVICE SPEED 10 KNOTS - COMPLEMENT 36 - BUILT (CONVERSION 1986)

THE PREDOMINANT TASKING OF THE 4 MAJOR VESSELS IN 1987/88 WERE:

JOHN P. TULLY - PHYSICAL, CHEMICAL SCIENCE & HYDROGRAPHY

PARIZEAU - PHYSICAL AND CHEMICAL SCIENCE

VECTOR - PHYSICAL AND CHEMICAL SCIENCE

W.E. RICKER - BIOLOGICAL SCIENCE

OF THE 2 MINOR VESSELS, CALIGUS SUPPORTS BIOLOGICAL SCIENCE AND RICHARDSON IS TASKED TO HYDROGRAPHY.

IN 1986/87, TULLY PRODUCED 213 OPERATIONAL DAYS AND STEAMED 21,000 MILES, WHICH INCLUDED A VOYAGE IN THE WESTERN ARCTIC.

PARIZEAU PRODUCED 175 OPERATIONAL DAYS AND STEAMED 21,600 MILES.

VECTOR PROVIDED 182 DAYS, STEAMING 13,325 MILES.

THE P & FF PATROL FLEET CONSISTS OF 2 OFFSHORE/NEARSHORE VESSELS OF 176' AND 124' IN LENGTH AND 29 INSHORE/NEARSHORE VESSELS RANGING IN LENGTH FROM 10 TO 23 METRES (33 TO 76 FEET).

THE 2 OFFSHORE VESSELS, TANU AND JAMES SINCLAIR, ARE ASSIGNED TO COAST WIDE PATROLS. IN ADDITION TANU IS MULTI-TASKED TO A SAR ROLE. AS A MATTER OF INTEREST, IN 1986 TANU PARTICIPATED IN 31 SAR INCIDENTS WHICH INVOLVED STEAMING OVER 600 NAUTICAL MILES FOR A TOTAL TIME OF 94 HOURS.

JAMES SINCLAIR, ALTHOUGH NOT MULTI-TASKED, WAS INVOLVED IN 23 SAR INCIDENTS, STEAMED 250 MILES, FOR A TOTAL ELAPSED TIME OF 62 HOURS.

STILL ON THE SUBJECT OF THE ~~HQ~~ Patrol VESSELS, i.e., TANU AND JAMES SINCLAIR. IN 1985 THE TANU CONDUCTED 761 BOARDINGS AND INITIATED 20 VIOLATIONS, WITH THE JAMES SINCLAIR CARRYING OUT 349 BOARDINGS, WHICH RESULTED IN 34 VIOLATIONS AND 64 WARNINGS.

WITH RESPECT TO THE INSHORE FLEET, THE PLANNED OPERATIONAL DAYS FOR THE VARIOUS FISHERIES WERE MET.

IT IS TO BE NOTED THAT THE INSHORE VESSELS ARE THE WORKHORSES OF THE FISHERY FLEET. THEY ARE TASKED TO AN EXTREMELY DIVERSE ROLE IN MONITORING OUR VARIOUS FISHERIES. FOR INSTANCE, IN THE ROE HERRING FISHERY, THEY ARE TASKED TO ASSESS THE STOCK VOLUME WITH THEIR HYDRO ACOUSTIC (SOUNDER AND SONAR) GEAR. ONCE AN AREA IS OPENED, THEY ARE THE MANAGEMENT AND/OR THE ENFORCEMENT PLATFORM. WHEN THE FISHERY IS SHUT DOWN FOR THE BALANCE OF THE SEASON, THEY DETERMINE THE AMOUNT OF SPAWN THAT HAS BEEN DEPOSITED. IT IS TO BE NOTED THAT THE ROLE OF THESE VESSELS IS COMPLETELY DIFFERENT FROM THAT CARRIED OUT ON THE EASTERN SEABOARD.

MAJOR EVENTS IN 1986/87:

THE CONVERSION OF THE PRIVATELY OWNED STERN TRAWLER CALISTRATUS TO THE DFO RESEARCH TRAWLER W.E. RICKER WAS COMPLETED IN JUNE.

WHILE WE ARE EXPERIENCING SOME PROBLEMS WITH THE MAIN TRAWL WINCH MOTORS, WHICH WILL BE SHORTLY RECTIFIED, THE VESSEL HAS, TO DATE, PERFORMED VERY WELL CONSIDERING THE MAGNITUDE OF THE WORK THAT WAS UNDERTAKEN.

FPV TANU UNDERWENT A MID-LIFE REFIT WHICH CONSISTED OF BOTH MAIN ENGINES BEING RE-BUILT.

ACCOMMODATION AREAS WERE UPGRADED WITH RESPECT TO FIRE PROTECTION AND HABITABILITY, NAVIGATIONAL UPGRADE, INCLUDING AN INTEGRATED NAVIGATION SYSTEM TO ENHANCE HER MANAGEMENT/ENFORCEMENT ROLE AND THE FITTING OF ARTICULATING DECK CRANES.

PLANNED EVENTS FOR 1987/88:

- THE REPLACEMENT OF THE AGING RICHARDSON HAS BEEN APPROVED.

- A SECOND REEF CLASS PATROL VESSEL HAS GONE TO TENDER AND HOPEFULLY CONSTRUCTION SHOULD COMMENCE LATE THIS SUMMER. THIS IS A CLASS VESSEL WHICH WILL REPLACE FPV FALCON ROCK, OUR DAWSON'S LANDING (RIVERS INLET) UNIT.

WITH THE CONSOLIDATION OF P & FF AND SCIENCE FLEET AND THE CLOSING OF THE NEW WESTMINSTER MARINE REPAIR DEPOT, THE REQUIREMENT FOR A NEW BERTHING AND REPAIR FACILITY, PLUS A HAUL-OUT CAPABILITY (TRAVELIFT) AT IOS FOR THE P & FF FLEET WAS OBVIOUS.

HOPEFULLY, THIS MATTER IS NOW UNDERWAY. IT IS ESTIMATED THAT 3.6 MILLION DOLLARS OVER A 3 YEAR PERIOD SHOULD PROVIDE THIS URGENTLY REQUIRED FACILITY. AS IT STANDS NOW, I WILL HAVE TO CONTRACT OUT DOCKINGS AND SECURITY FOR THE PATROL FLEET THIS WINTER. THIS COMES UNDER THE HEADING OF DOING MORE WITH LESS.

SUMMARY OF REPORT TO RVOC ON M/V BERNIER

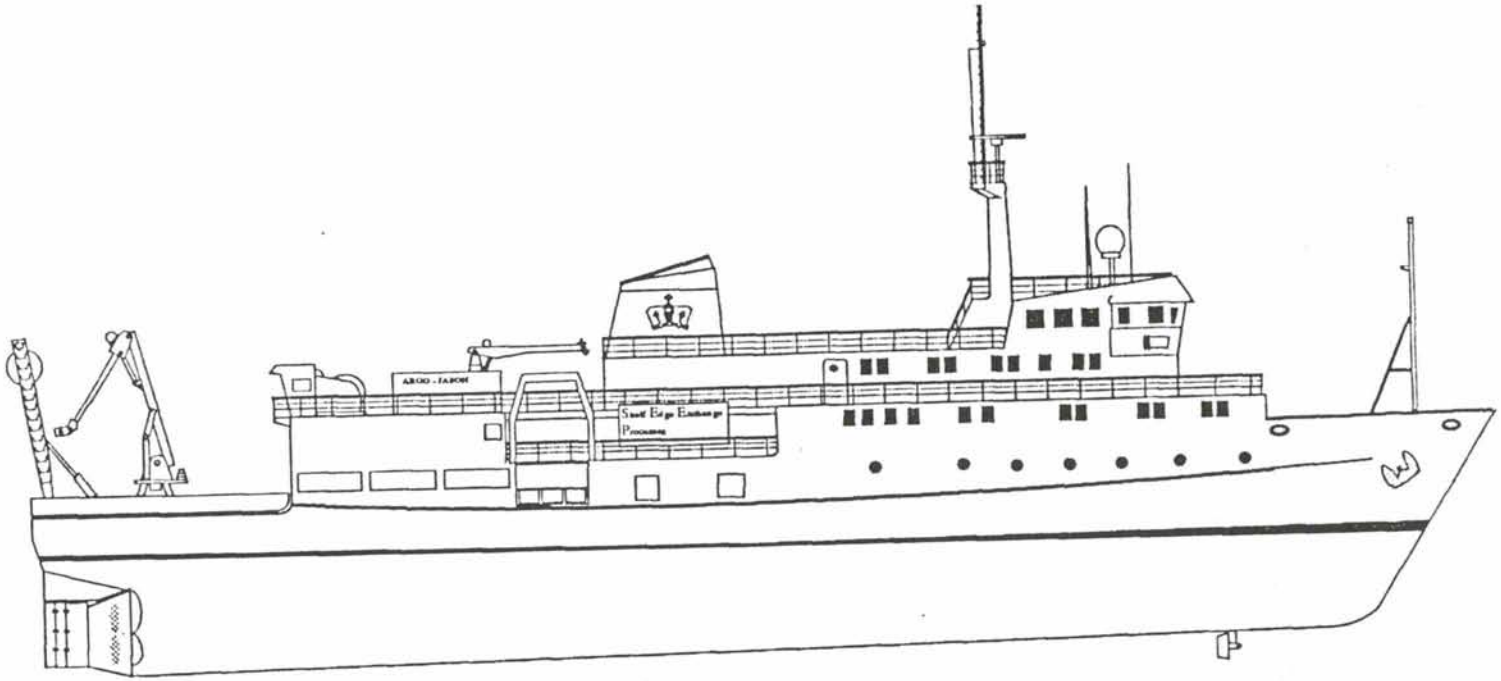
A presentation was given at RVOC by Sam Gerard of Lamont-Doherty Geological Observatory on M/V BERNIER, a Canadian seismic survey vessel, which Lamont has proposed to acquire and convert to a general-purpose oceanographic vessel.

The total proposed budget to NSF is for $10 million, 6.5 million for purchase and $3.5 million for modifications and outfitting.

Specifications of M/V BERNIER (after modification) were compared with those of the High and Medium Endurance vessel designs proposed by the UNOLS Fleet Improvement Committee and with the AGOR-23. and R/V KNORR.

It was emphasized that the illustrations represented conceptual designs only and that input from other UNOLS institutions would be solicited before finalizing the modification plans.

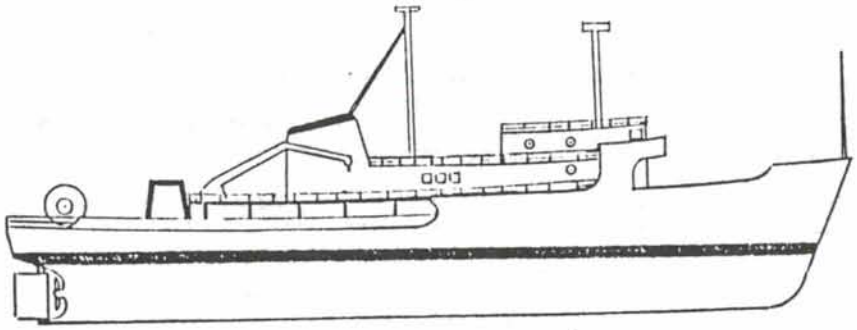
If the pending proposal is funded, BERNIER would be modified in 1989 and would join the UNOLS Fleet in 1990.



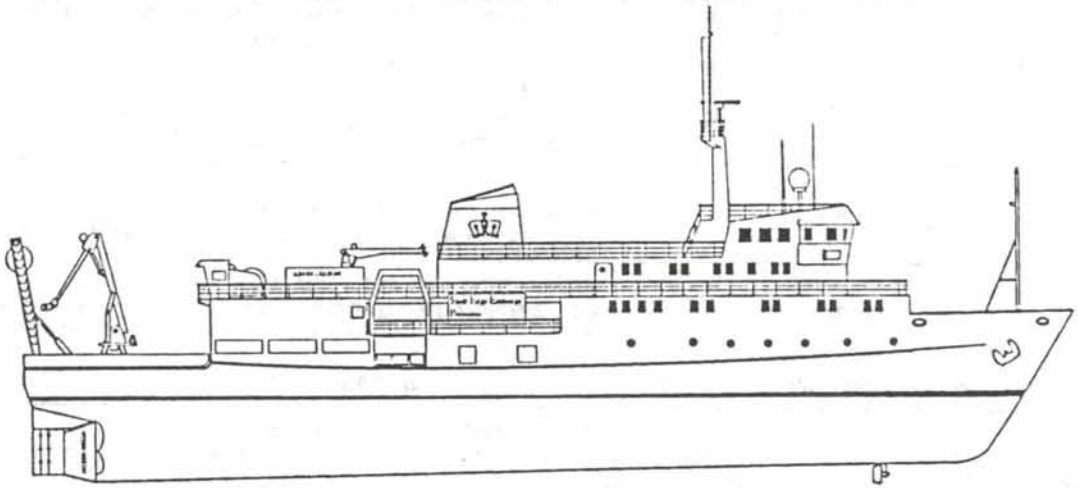
M/V BERNIER

OUTBOARD PROFILE

WITH PROPOSED MODIFICATIONS



R/V CONRAD



M/V BERNIER

1962	BUILT	1983
208' 4"	LENGTH OVERALL	238' 8"
37' 5"	BEAM	45' 11"
15' 3"	DRAFT	17' 4"
1,000 HP.	PROPULSION	3,200 HP
1,072	GROSS TONS	1,978
1,425 T	DISPLACEMENT (FULL)	2,665 T
68,720 Gals	FUEL CAPACITY	173,054 Gals
Marine Gas Oil (MGO)	FUEL TYPE	Intermediate WT Diesel Fuel
10 Kts.	SPEED (CRUISING)	12 Kts
9,000 MI	RANGE (AT CRUISING SPEED)	15,000 MI
12 Kts.	SPEED (FULL)	14 Kts
$2,957	FUEL COST/1,000 MILES @ CRUISING*	$2,152
45 Days	ENDURANCE	60 Days
21	CREW	18
22	SCIENTIST	32
1,340	LABORATORIES (SQ. FT.)	2,800
1,558	MAIN DECK WORK AREA (SQ. FT.)	2,950
4,900	STORAGE SPACE (CU. FT.)	11,732
$12,804 (1988 Actual)	DAILY OPERATING COST	(1990 Projected) $12,948

*Based on average price of MGO and Intermediate Fuel Nov. 1, 1988.

SUMMARY COMPARISON OF SCIENCE REQUIREMENTS FOR LARGE SHIPS

Science Mission Requirements for New Oceanographic Ships,
Selected Data* from: UNOLS Fleet Replacement Committee, June 1986

	AGOR 23 ORIGINAL SPEC. & (CURRENT)	UNOLS* HIGH ENDURANCE R/V (Monohull)	**M/V BERNIER (as modified)**	UNOLS* MEDIUM ENDURANCE R/V (Monohull)
SIZE RANGE	(263 ft.)	Class I 250-300 ft.	**239 ft.**	Class II 200-250 ft.
ENDURANCE	(45 days working; 12,000 miles at sustained operational speeds)	60 days: 30 days cruising, 30 days working. 15,000 miles total range at cruising	**60 days , 15,000 miles at 12 knots. 45 days, 12,000 miles at 14 knots.**	50 days: 25 days cruising, 25 days working. 12,000 miles range at cruising.
CRUISING SPEED	(15 knots)	15 knots	**14 knots**	14 knots
SEAKEEPING	12 knots through SS 5 6 knots through SS 6	15 knots through SS 4 13 knots through SS 5 8 knots through SS 6	**14 knots through SS 4; Vessel routinely carries out surveys at 6 knots up to SS 6**	14 knots through SS 4 12 knots through SS 5 8 knots through SS 6
STATION KEEPING	300 ft. radius SS 5, 2 knots current	Dynamic positioning, best heading: SS 5, 3 knot current; 150 ft. maximum excursion	**Dynamic positioning, best heading: SS 5, 3 knot current; <150 ft. max. excursion (Design spec)**	Same as UNOLS Class I
PRECISION TRACKLINE	No Data Available	Precision trackline at min. 2 knots; max. lateral excursion 150 ft. at SS 5	**Same as UNOLS Class I**	Same as UNOLS Class I
TOWING	10,000 lbs. at 5 knots; 20,000 lbs. at 2.5 knots	Towing capacity of 10,000 lbs. at 6 knots; 25,000 lbs. at 2.5 knots in SS 5	**Routine towing of 18,000 lbs. at 5 knots up to SS 6**	Same as UNOLS Class I
SCIENCE ACCOMODATIONS	30 Scientific Personnel	30-35 Scientific Personnel in 2 person staterooms expandable to 40 using vans	**32 Scientific Personnel in 2 person staterooms expandable to 37 using portable berthing van**	20-25 Scientific Personnel in 2 person staterooms expandable to 30 in portable berthing vans
DECK WORK AREA	3,000 sq. ft. with contiguous 12 ft. x 100 ft. along side handling area; 100 tons disposable load	3,000 sq. ft. with contiguous 12 ft. x 50 ft. along side handling area; 100 tons disposable load	**Main deck 2,950 sq. ft. with contiguous 14 ft. x 96 ft. area along side plus >3,000 sq. ft. on A and B docks; 100 tons disposable load**	2,000 sq. ft. with contiguous 12 ft. x 40 ft. along side handling area; 90 tons disposable load
LABORATORY AREA	3,200 sq. ft. (plus 4 vans)	4,000 sq. ft. plus 4 portable vans	**>2,800 sq. ft. plus 4 vans**	3,000 sq. ft. plus 2 portable vans with inside access
SCIENCE STORAGE	13,000 cu. ft.	20,000 cu. ft.	**11,732 cu. ft., of which 5,700 cu. ft. is climate controlled.**	15,000 cu. ft.
ICE STRENGTHENING	ABS Class C	ABS Class 1B except ABS Class 1AA when specified as ice capable	**Hull: ABS A1 Ice Class 1AA Overall: ABS A1 Ice Class 1A**	ABS Class 1C
ACOUSTICAL SYSTEMS	Same as UNOLS Class I	SEA BEAM, 3.5 kHz and 12 kHz echo sounding, Doppler profiling bottom positioning	**SEA BEAM, 3.5 kHz and 12 kHz echo sounding (Doppler profiler pending special funding)**	Same as UNOLS Class I
MULTI-CHANNEL SEISMICS	(600 HP for compressors) assume 900 scfm at 2,000 psi	Selected vessels to carry seismic air compressors for 4,000 scfm at 2,500 psi, and a large array MCS system	**Seismic compressors for 3,000 scfm at 2,500 psi plus 400-800 scfm with vans; 120-240 channel digital MCS array**	Selected vessels to carry seismic air compressors for 4,000 scfm at 2,500 psi, and a large array MCS system

COMPARATIVE SPACE ON MAIN DECKS

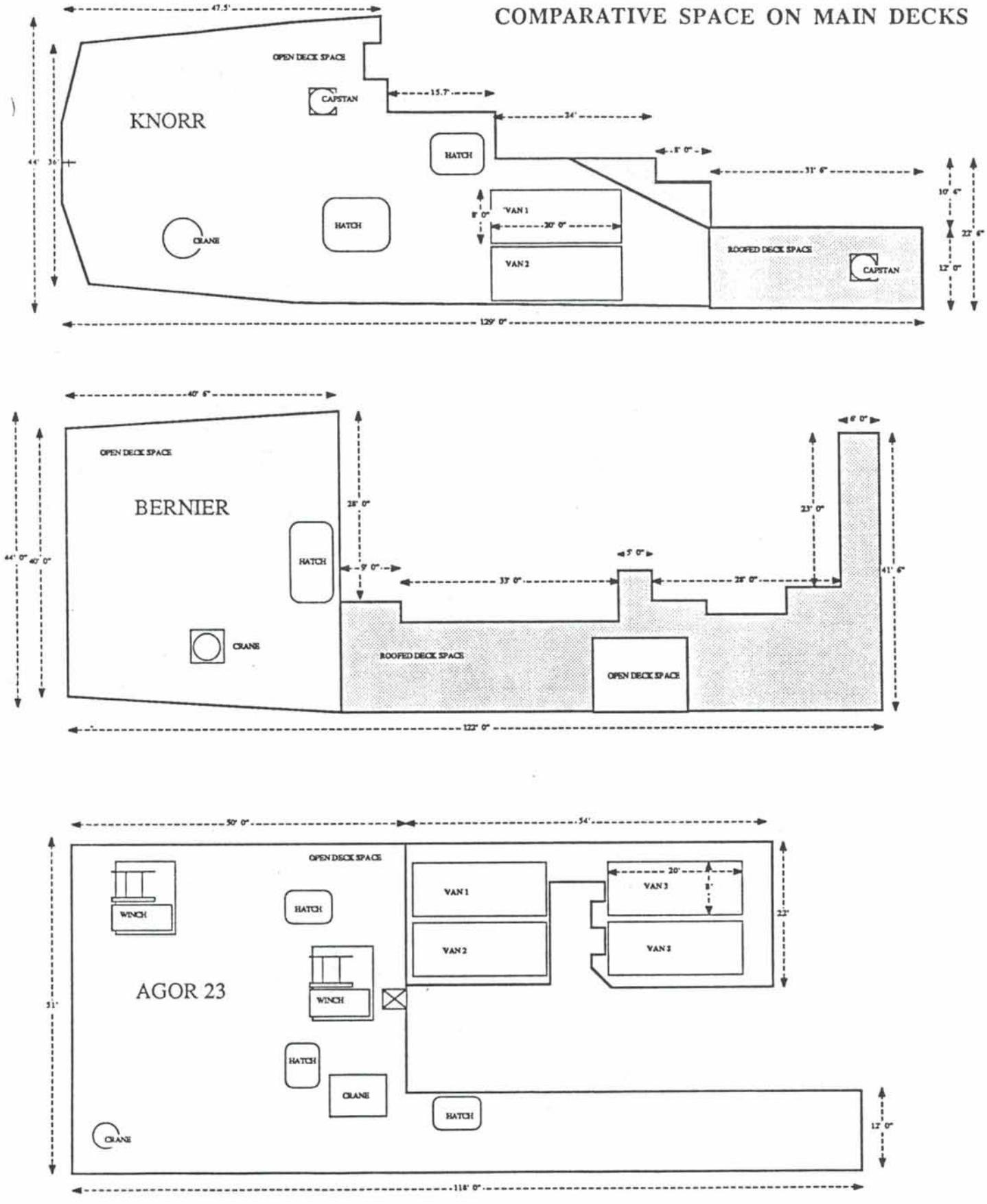
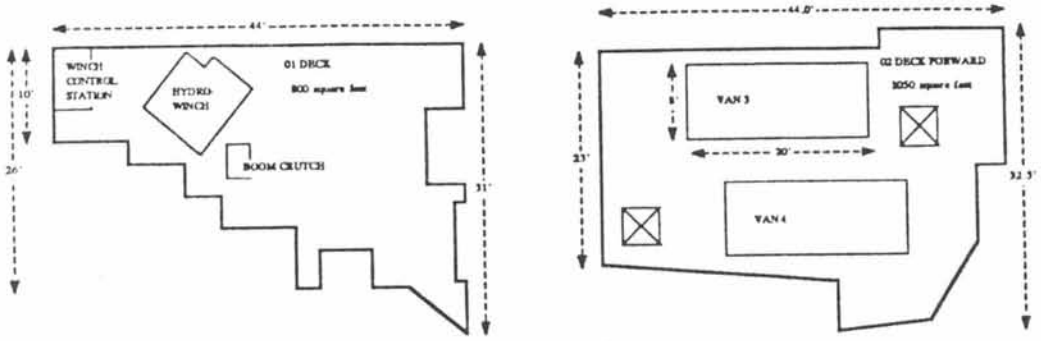


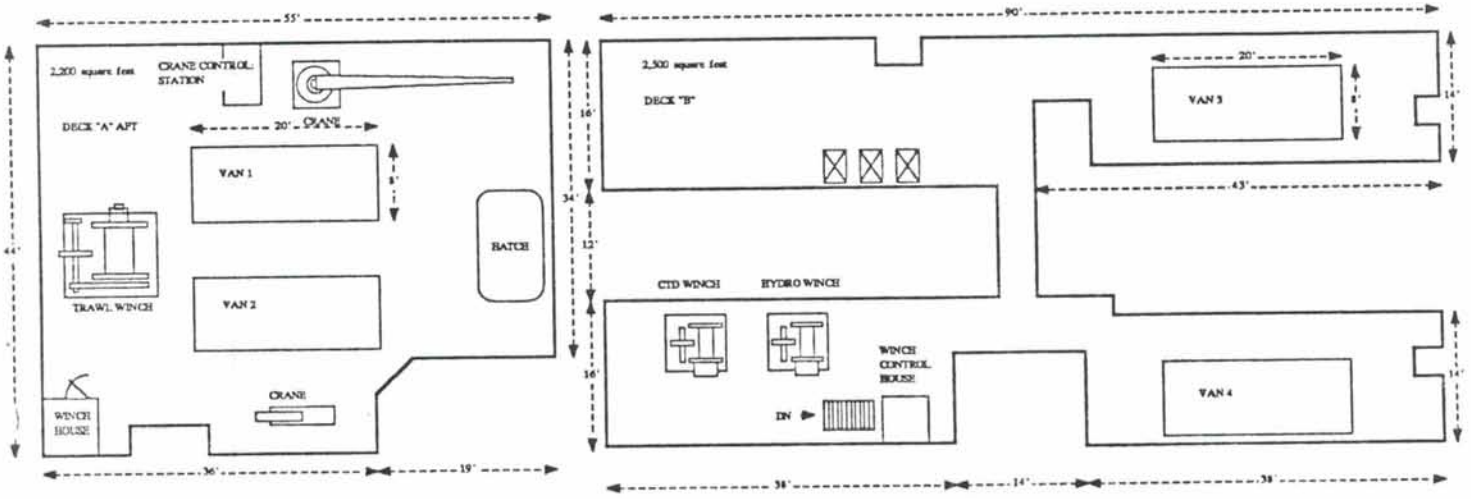
Figure 11A

KNORR



COMPARATIVE SPACE ON DECKS OTHER THAN MAIN DECK

BERNIER



AGOR 23

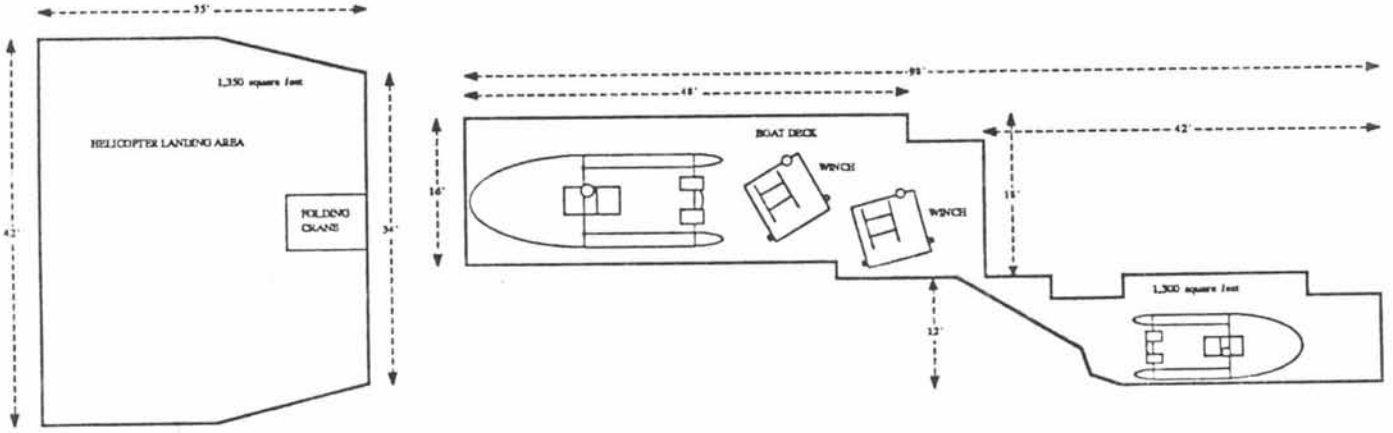


Figure 11B

COMPARATIVE SPACE IN MAIN LABORATORIES

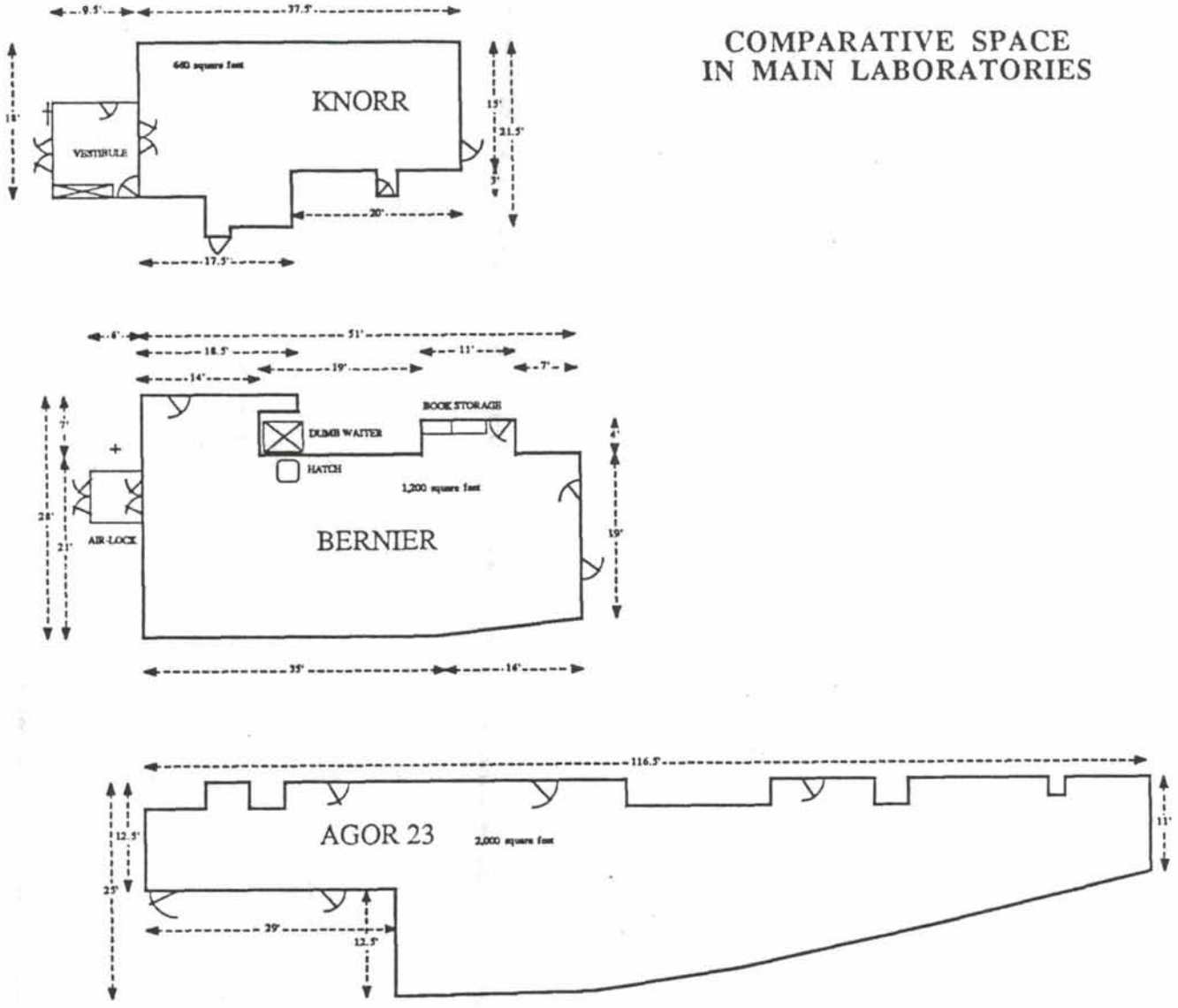
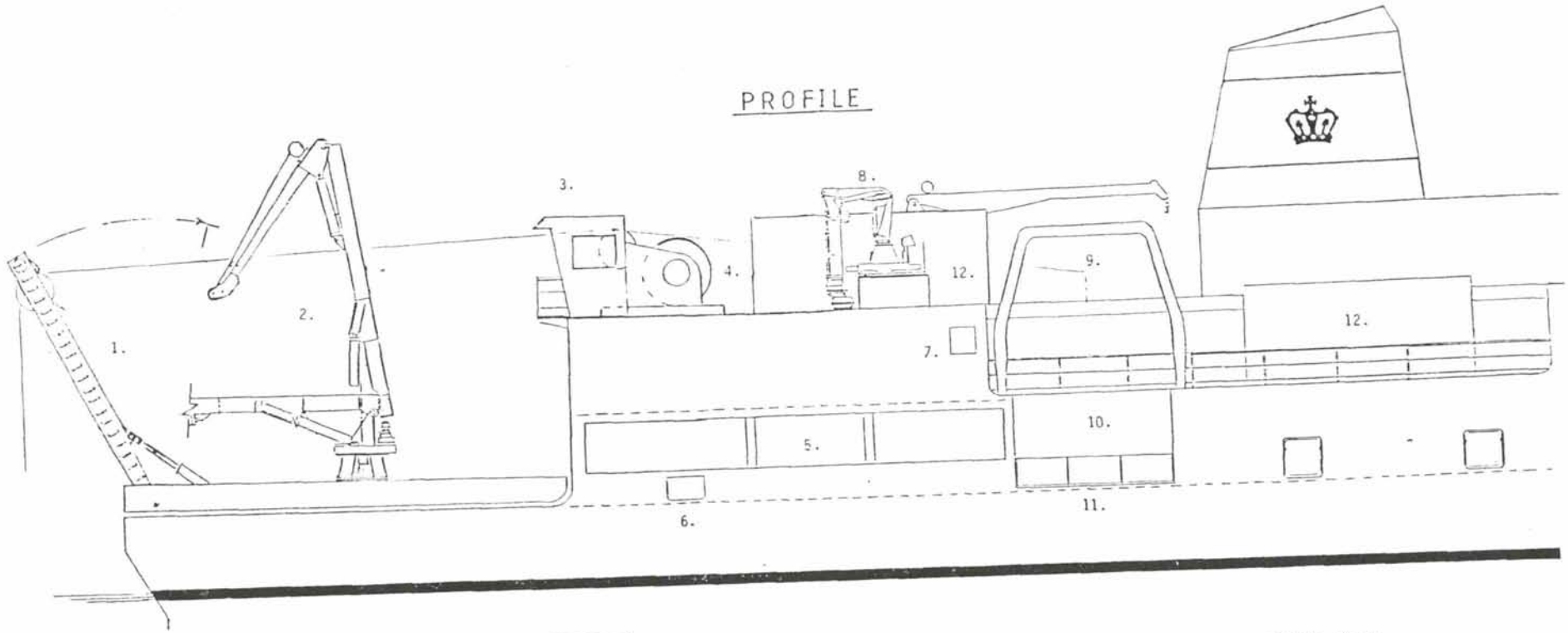
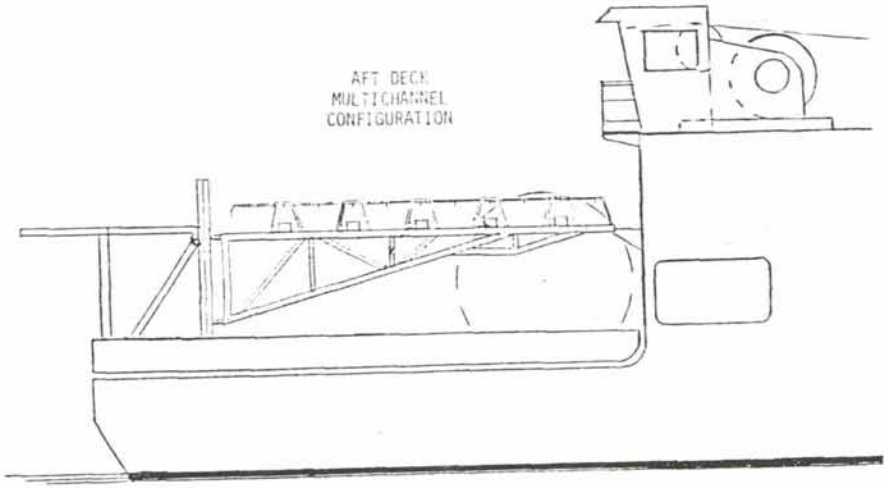


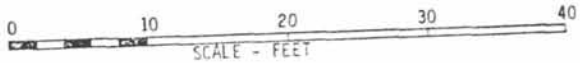
Figure 11C

PROFILE

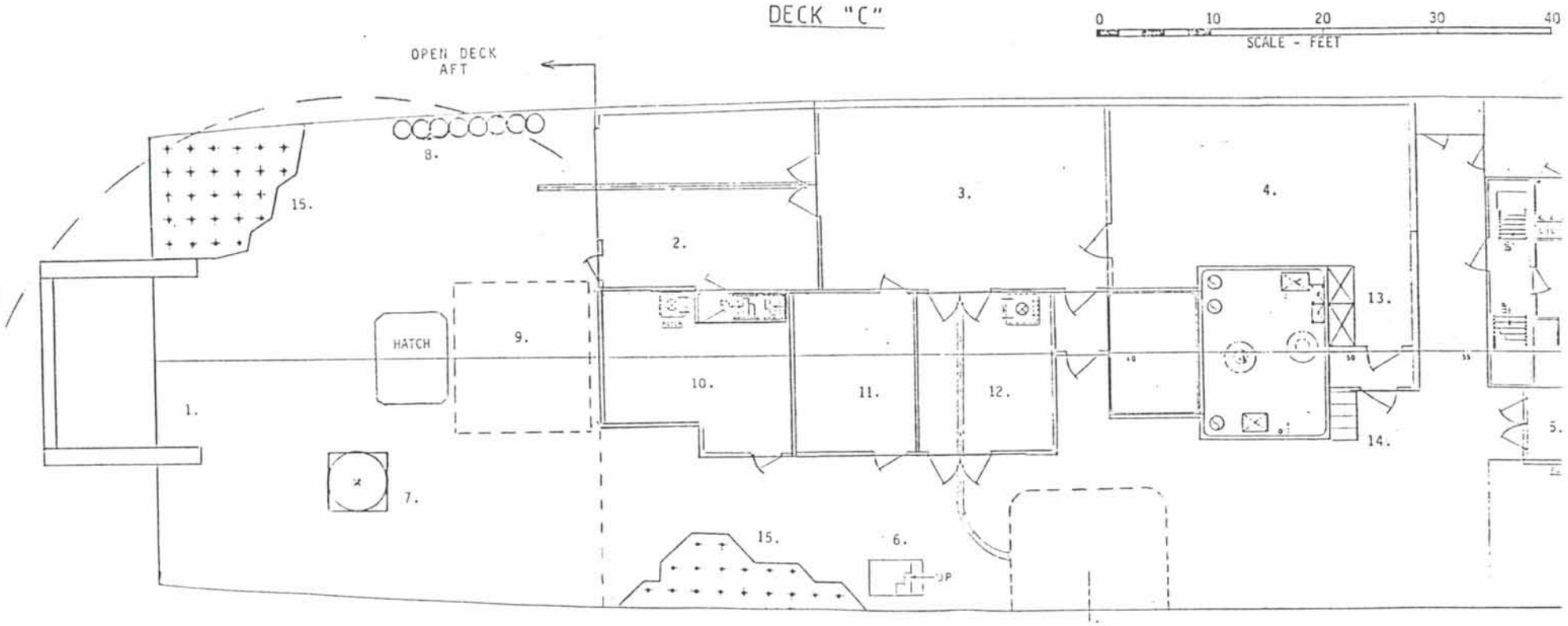




1. "A" FRAME (24' HIGH).
2. STERN CRANE (35' MAX REACH).
3. AFT SHIP CONNING STATION AND WINCH CONTROL STATION.
4. CORE/TRAWL WINCH.
5. SIDE CUT-OUT AND STANCHIONS.
6. FREEING PORTS MODIFIED.
7. WINCH CONTROL BOOTH.
8. HIAB CRANE RELOCATED.
9. "A" FRAME.
10. CUT-OUT.
11. PORTABLE BULWARKS.
12. CONTAINER.

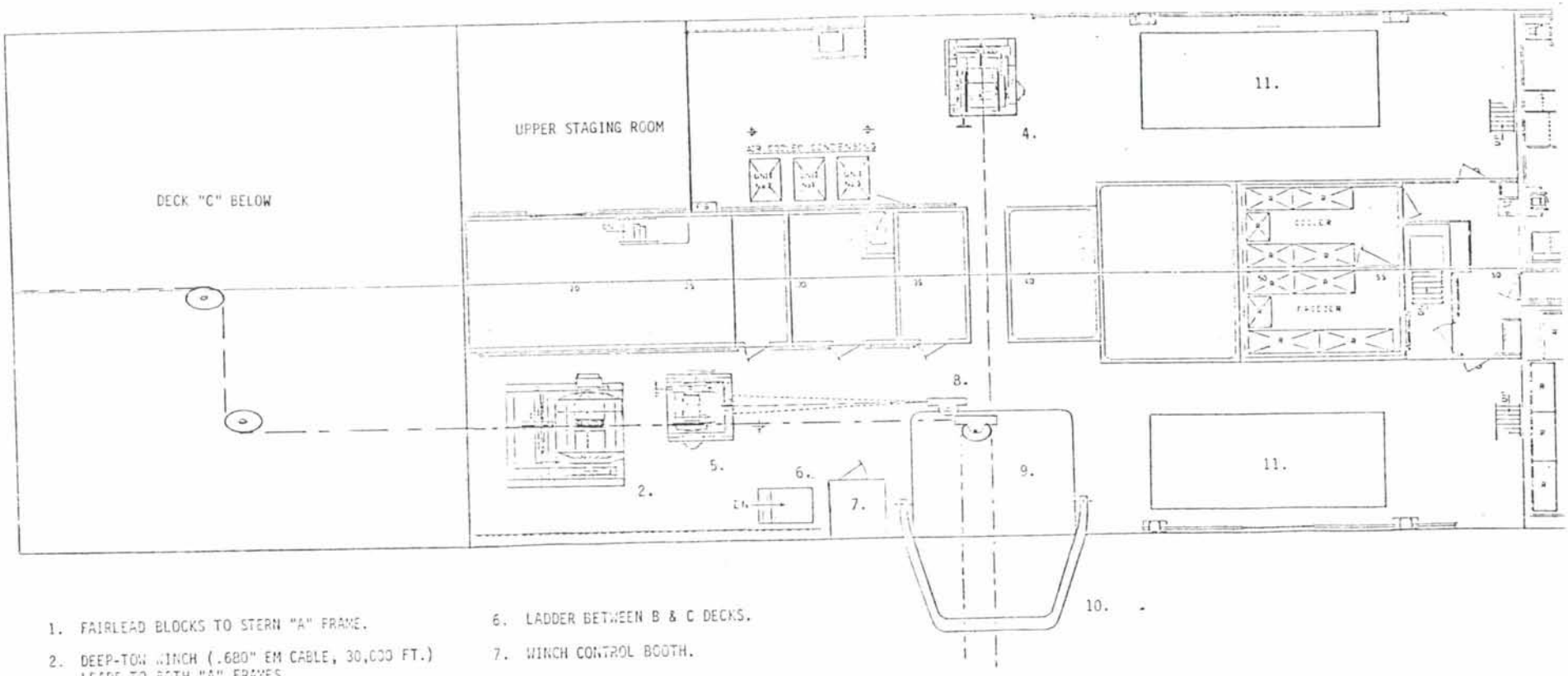


DECK "C"



1. "A" FRAME (24' HIGH, PORTABLE).
2. VEHICLE STAGING ROOM 335 SQ. FT. (WITH MONORAIL) 16 FEET HIGH
3. WET LAB 450 SQ. FT.
4. ANALYTICAL LAB 498 SQ. FT.
5. DOUBLE DOOR AIR LOCK TO DRY LAB (LAB AREA 1225 SQ. FT.)
6. NEW LADDER
7. CRANE FOUNDATION
8. LARGE VOLUME WATER SAMPLER STORAGE
9. REMOVABLE STREAMER REEL LOCATION
10. SHOP
11. SCIENTIFIC STORAGE
12. CTD SAMPLING ROOM (WITH MONORAIL)
13. 2 FUME HOODS (ACID & ORGANIC)
14. GAS BOTTLE STORAGE
15. THREADED SOCKETS THROUGHOUT MAIN WORKING DECK

DECK "B"

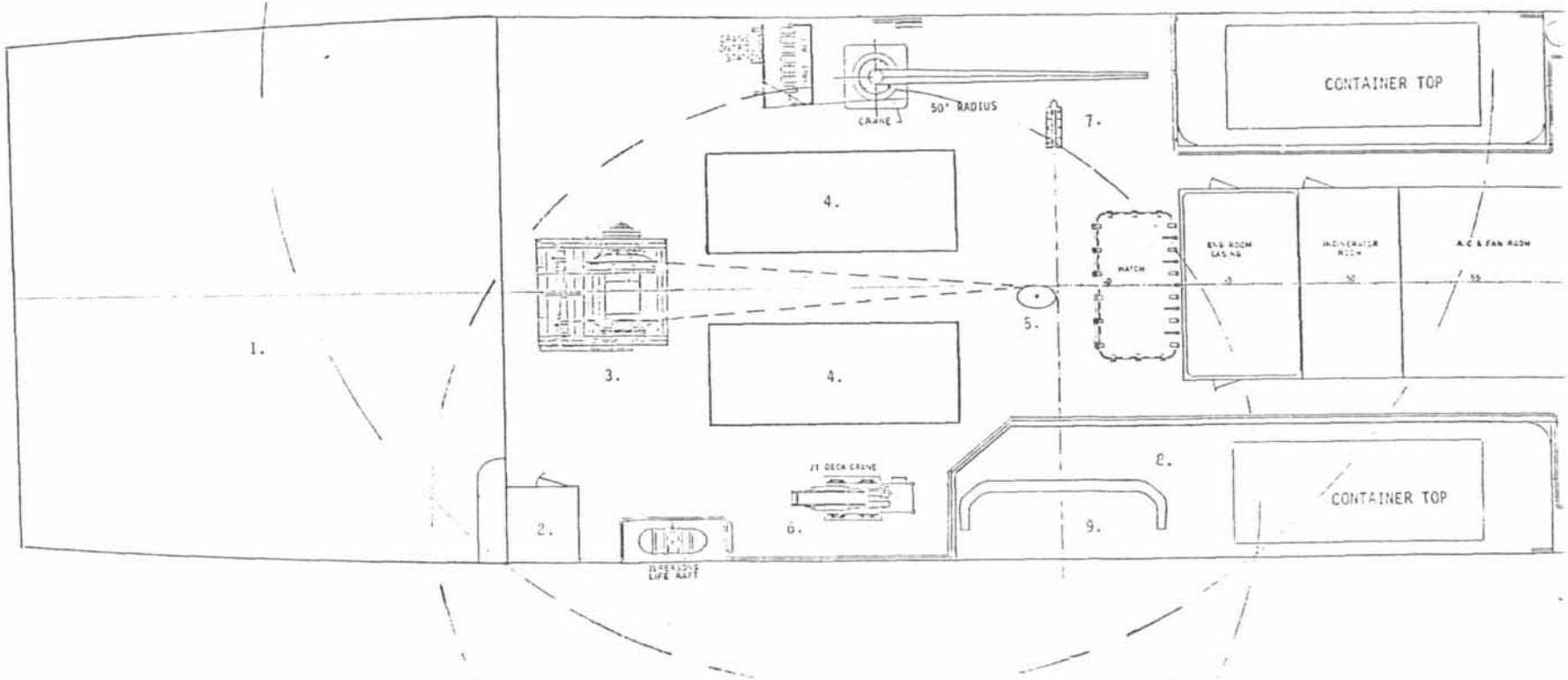


1. FAIRLEAD BLOCKS TO STERN "A" FRAME.
2. DEEP-TOW WINCH (.680" EM CABLE, 30,000 FT.) LEADS TO BOTH "A" FRAMES.
3. FIXED TURNING BLOCK (30" DIA) LEADS UPWARD.
4. CTD WINCH (.320" EM CABLE, 33,000 FT.).
5. HYDRO WINCH (1/4" WIRE ROPE, 30,000 FT.).
6. LADDER BETWEEN B & C DECKS.
7. WINCH CONTROL BOOTH.
8. FLAG BLOCKS FOR CAMERA AND DEEP TOW WINCHES
9. DECK CUT-OUT.
10. "A" FRAME, OUTBOARD POSITION.
11. 8' x 20' CONTAINER.

DECK 'A'

0 10 20 30 40

SCALE - FEET



1. DECK "C" BELOW.
2. AFT SHIP CONNING STATION AND WINCH CONTROL STATION.
3. CORE/TRAWL WINCH.
4. 8' x 20' CONTAINERS
5. FIXED FAIRLEAD BLOCK (30" DIA) FOR CORE WIRE.
6. HIAB CRANE (34 FT. MAX.)
7. FIXED FAIRLEAD BLOCK (30" DIA) FOR DEEP TOW CABLE.
8. ADDITIONAL DECK CUT-OUT.
9. "A" FRAME, INBOARD POSITION.

OVERALL PERSPECTIVE ON SAFETY CONSIDERATIONS

A. CONSIDERATIONS OF PRIMARY INTEREST TO VESSEL DESIGNERS & CONSTRUCTORS

B. CONSIDERATIONS OF PRIMARY INTEREST TO VESSEL USERS -- CREW & SCIENCE PARTY

1. RESEARCH VESSEL SAFETY STANDARDS

2. SAFETY TRAINING PROGRAM

A) SAFETY TRAINING MANUAL

B) SAFETY TRAINING VIDEO TAPES

C) TRAINING COURSES

SAFETY TRAINING MANUAL

TOPICS TO BE DISCUSSED AT MEETING

A. ROUGH DRAFT OUTLINE

B. FORMAT -- SIMILAR TO NPFVOA PUBLICATION OR OTHER FORMAT?

C. DETAIL WORK ON MANUAL -- IN HOUSE OR OUTSIDE?

D. FUNDING -- A SEA GRANT PROJECT OR OTHER SOURCE?

E. OTHER RELATED TOPICS

SAFETY TRAINING MANUAL

OUTLINE

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   - B. RESPONSIBILITIES FOR SAFETY (GENERAL CONSIDERATIONS)
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     - 2) CREW'S RESPONSIBILITIES
     - 3) SCIENCE PARTY'S RESPONSIBILITIES

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   - B. COMPARTMENTATION (ELEMENTS OF SUBDIVISION CONSIDERATIONS, OPENINGS IN WATERTIGHT BULKHEADS, WATERTIGHT INTEGRITY, ETC.)
   - C. VESSEL SYSTEMS
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     - 2) FUEL/LUB SYSTEMS
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4) ELECTRICAL SYSTEM/EQUIPMENT

5) SEAWATER COOLING SYSTEMS

6) HYDRAULIC SYSTEMS

7) COMPRESSED AIR SYSTEMS

8) NAVIGATION SYSTEM

9) SANITATION/ANTI-POLLUTION SYSTEMS

10) REFRIGERATION SYSTEMS

11) EMERGENCY SYSTEMS

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11. WATCH KEEPING

A. INTRODUCTION TO WATCH KEEPING (A SUMMARY OF SHIPBOARD AND WEATHER/SEA SITUATIONS OF WHICH A PERSON ON WATCH MUST BE AWARE)

B. WATCH KEEPING STANDARDS (PERSONAL CONDUCT AND BEHAVIOR WHILE ON WATCH)

C. WEATHER

1) TYPES OF WEATHER

2) FORECASTING WEATHER (FORECASTING AIDS, RULES OF THUMB, ETC.)

D. ACTIONS REQUIRED IN HEAVY WEATHER (MANEUVERING TO AVOID STORM CENTER, HEAVING-TO, ETC.)

E. RADIO PROCEDURES IN DISTRESS

F. SIGNATURE PAGE

12. THE U.S. COAST GUARD AND SAFETY AT SEA

A. FEDERAL REGULATIONS (REGARDING EQUIPMENT REQUIRED ABOARD SHIP)

B. FLOAT PLANS

C. MEDICAL ADVICE AND INFORMATION

D. SEARCH AND RESCUE PROCEDURES

E. BOARDINGS

F. TOWING

G. DEWATERING PUMPS

H. HELICOPTER EVACUATION

I. REPORTING MARINE ACCIDENTS

J. SIGNATURE PAGE

RVOC SAFETY WORKSHOP
Video Training Programs - Outline
5 October 1988

Discussion would have a common starting point if participants review the "Marine Firefighting" videotape series by Gulf Publishing Company, provided to vessel operators by the UNOLS office; and give pre-workshop consideration to the questions raised below.

Premise for Session:

- Emphasis on vessel safety
- Short segments 15-20 minutes
- VHS format
- Some copyright latitude obtainable
- Easy to update
- Technical expertise within community
- Limited support funds

Video Sources

- Sea Grant institutions
- NPFVOA
- MITAGS
- Equipment manufacturers
- State Accident Prevention Division
- Worker's Compensation Insurer
- The "Video Source Book" by National Video Clearing House, Inc., Syosset, NY
- Others? (Bring information)

I. Indoctrination of Scientific Parties

- What are we trying to accomplish?
- What topics should be covered?
- Generic or ship specific?
- Time limit?
- More than one segment?
- Look for examples--airlines?
- View portions of examples:
  "Shrimp Boat Safety," TAMU Sea Grant
  and
  "Shipboard Orientation Program," Video-Tech Halifax

II. Indoctrination of New Crew Members

- Topics to be covered?
- Keyed to a safety manual?
- What pre-employment training should be expected? How recent?

- How much time and/or to what depth?
- View segments of Safety at Sea videotape series by NPFVOA.

III. In-depth, Ongoing Crew Training

- What topics should we consider? Some recommendations:

  Basic safety-electrical, machinery, galley
  Protective equipment
  Hazardous materials
  First aid/CPR
  Medical emergencies
  Hypothermia
  Firefighting--procedures, equipment
  Lifesaving equipment
  Survival procedures

- Supplements/refreshers to shore-based schools?
- Can these topics be covered generically?
- How much time should be devoted to a topic?
- Consider three topics for discussion:

  1. Firefighting: Are UNOLS tapes adequate? Do they need to be supplemented? Improved? Replaced?
  2. Hypothermia: A small topic with a wealth of existing video. View segments of some. Will these suffice alone or in edited combination?
  3. Medical emergencies: Somewhat of a void now. What is needed? Should MAS, the common denominator, be called upon to produce something?

IV. How to Provide Videotapes to RVOC

- Establish a clearinghouse/committee to locate, review, recommend and arrange for distribution?
- Components of video production?
  - Script writing
  - Shooting
  - Editing
  - Reproduction
  - Distribution
- Produce and distribute using RVOC members in-house expertise and facilities? Examples: OSU "Communicating with Video" workshops (self-help), and OSU Communication Media Center video production facilities (time and materials).
- Outside expert using in-house or commercial production facilities?
- Full commercial production?

North Pacific Fishing Vessel Owners' Association

VESSEL SAFETY PROGRAM

ORDER FORM

NPFVOA USE ONLY	
Rec'd	
Shipped	
Paid Ck#	
Amount	
Ck.Dep.	

Date: _____

Name: _____ SHIP TO: _____

Co./Vessel: _____ _____

Address: _____ _____

City: _____ _____

State: _____ Zip: _____ _____

Telephone: (___) _____ SHIP VIA: 4th Class Mail _____

Other _____

ITEM	QUANTITY	PRICE	TOTAL
Vessel Safety Manual	_____	$45.00/ea.	_____
Safety & Survival at Sea Series (4 tapes) VHS _____ or BETA _____	_____	$125.00/st.	_____
Individual Tapes: VHS ____ or BETA _____			
Safety Equip. & Survival Procedures (46 min.)	_____	$35.00/ea.	_____
Fire Prevention & Control (26 min.)	_____	$35.00/ea.	_____
Medical Emergencies at Sea (42 min.)	_____	$35.00/ea.	_____
Fishing Vessel Stability (22 min.)	_____	$35.00/ea.	_____
Emergency Medical Technician (EMT) Book	_____	$25.00/ea.	_____
		SUB-TOTAL:	_____
WASHINGTON STATE RESIDENTS ADD 8.1% SALES TAX: (multiply sub-total by .081)		**SALES TAX:**	_____
		SHIPPING FEE:	_____
		TOTAL ORDER:	_____

Orders mailed within the U.S. price includes shipping fee. Orders outside U.S. (including Canada) add $5.00 shipping fee for each manual and/or videotape set ordered and $1.50 shipping fee for each individual tape ordered. All orders are sent 4th class mail unless another method is requested, in which case, the purchaser must pay shipping. Delivery will take from 2 - 4 weeks.

PLEASE MAKE CHECKS PAYABLE TO:

MAIL PAYMENT WITH ORDER
ALL ORDERS MUST BE PREPAID

NPFVOA VESSEL SAFETY PROGRAM
BLDG. C-3, ROOM 218
FISHERMEN'S TERMINAL
SEATTLE, WA. 98119
(206) 285-3383

WE REGRET WE CANNOT ACCEPT PURCHASE ORDERS OR CREDIT CARDS
Thank you for your order

id:djp:5.88

RVOC

VESSEL SAFETY PROGRAM - VIDEO VIEWING FORM

DATE:

VIEWER:

TITLE:

PRODUCER:

LENGTH:

SOURCE:

COST: RENT:_____ PURCHASE:_____

CONTENT SUMMARY: RATING: E/G/F/P

VIDEOGRAPHY SUMMARY: RATING: E/G/F/P

EVALUATION/COMMENTS:

Does video relate to UNOLS safety program?

Is video worth cost?

Etc.

UNOLS TRAINING GUIDE

NAME: Washington State Fire Service Training

SCHOOL: Basic Marine Firefighting

CONTACT INFO: Ms. Tina Lyons
c/o Washington State Fire Training Service
P.O. Box 1273
North Bend, WA 98045

PHONE: (206)888-4523 or (206)453-6418

COST: $300.00 per student

DURATION: 5 DAYS Monday - Friday 0800-1600

REGISTRATION: Enrollment can be done via telephone. School will want registration form sent to them which also acts as liability waiver (must be signed by institution representative).

BILLING: School will invoice directly after completion of course. May pay on arrival if desired.

LODGING: Holiday Inn Issaquah
1801 12th Ave. NW
Issaquah, WA 98027
ph.(206)392-6421 Tamara Morgan
$35.00 per night single plus tax for students of school

TRANSPORTATION: If flying into Seattle airport. Recommend rental car for duration. School is located approx. 50 mi. east of Seattle on I-90. Issaquah is off exit 15 & school is off exit 38 thence 5 miles North.

MEALS: Lunch is NOT provided at school. Recommend purchasing sack lunch from Holiday Inn (cost $6.00 per meal).

PERTINENT INFO: School is in a remote location. Usually best to supply transportation of some type. Nothing is within walking distance from school. Hotel is located in a semi-urban area close to a few amenities. Students are required to bring own gloves, rubber boots, & work clothing. All other gear provided at the school.

LAST USE: 1/5/88 - 4 Crew members - all completed course with no problems

Washington Fire Training Center-North Bend

REGISTRATION FORM

NOTE: Participation in Fire Training Center classes may involve exposure to risks incidental to the function of a fire training school. By this application, the attendee assumes all such risks. A safety release must be signed at the Center prior to participating in fire ground activities.

If a student has to cancel for any reason it is important to notify the FST office 1-800-562-6138 at least 72 hours in advance. Another student may be substituted only if a new registration form is signed by the company supervisor.

The class is subject to confirmation. If you do not receive a notice of acceptance 2 days prior to the class date, call 1-800-562-6138. Please do not depart for a scheduled T.C. class without our assurance that a place has been reserved for you.

Course Information (print)

Course _____

Course Date _____

Student Information (print)

First Name _____ Last Name _____

Soc. Sec. Number _____

Home Address _____

City _____ State _____ Zip _____

Day Phone _____ Night Phone _____

Sex _____ Ethnic Origin _____ Rank _____

Company Information For Billing Purposes (print)

Company _____

Supervisor's First Name _____ Supervisor's Last Name _____

Billing Address _____

City _____ State _____ Zip _____

Day Phone _____ Night Phone _____

Authorization

The above student is authorized by this department to participate in hands-on firefighting at the Fire Training Center.

Supervisor's Signature _____

On-Site Housing Registration:

Please make room reservations for me as follows:

I will arrive _____ (day, date) Checkout _____ (day, date)

Roommate requested _____ I wish to room with _____ (name & Department)

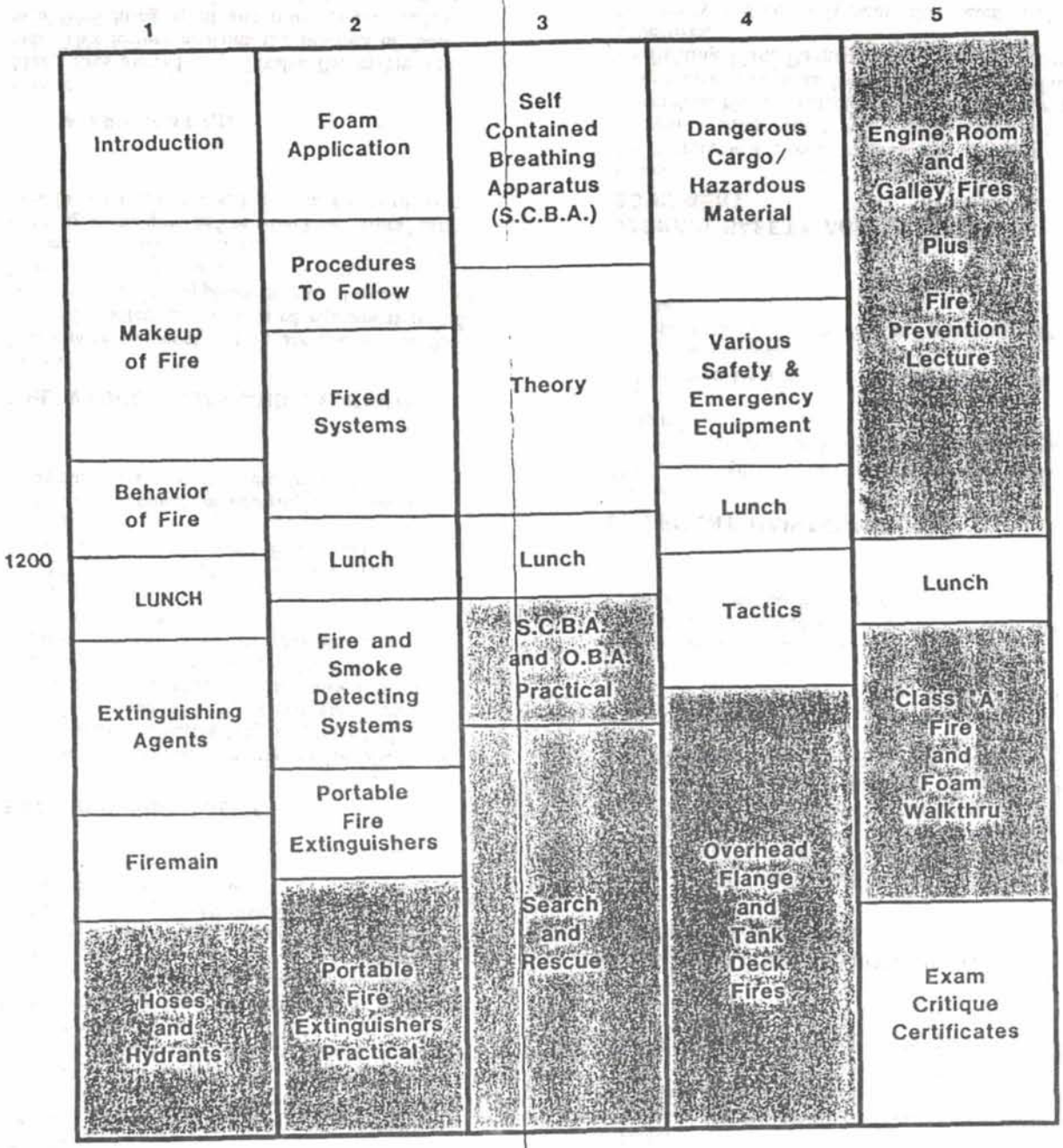
Double Occupancy $10.00 per day per person Make check payable to **DEPARTMENT OF COMMUNITY DEVELOPMENT - FST**

Check enclosed ☐ Amount _____ Will pay on arrival ☐ Will pay with company invoice ☐

Return this form to: Washington State Fire Service Training
~~Bldg. 17, MS LS-14 Airdustrial Park~~ P.O. Box 1273
~~Olympia, WA 98504~~ North Bend, WA 98045

FST-041-80-351 (2/86) QX A-229

BASIC MARINE FIREFIGHTING



INTRODUCTION

Course

The purpose of this lesson topic is to acquaint the student with the course itinerary and identify and discuss the course's main objective. A film will be shown concerning the disasterous results of fire at sea, and the instructor will lead a discussion relating to causes for the fire and lessons learned.

Objectives:

1. Identify five hazards which cause shipboard fires at sea.
2. List three unique problems encountered with shipboard fires at sea, in writing, for the instructor.
3. Indicate the need for shipboard fire prevention, in writing, for the instructor.

MAKEUP OF FIRE

Course

The purpose of this lesson topic is to enable the student to identify and describe the process of combustion in the different types of fuels; and identify and describe the fire triangle and how the chain reaction supports and effects it. The student will be able to define and distinguish between the four classes of fire, and describe the rationale supporting fire classifications.

Objectives:

1. Describe the process of combustion using the fire triangle.
2. List all the types of combustion, in writing, for the instructor.
3. Draw the fire traingle and state chain reaction, in writing, for the instructor.
4. Identify the distinction between class A, B, C and D fires orally for the instructor.
5. Present the rationale for the fire classifications as requested by the instructor orally.

BEHAVIOR OF FIRE

Course

The student will demonstrate a basic knowledge of fire behavior and describe how fire can spread aboard a vessel. Discussion will include common materials involved in heat transfer aboard a vessel; the three phases of burning as a fire develops and how each phase may help or hinder firefighting efforts.

BEHAVIOR OF FIRE

Objectives:

1. Demonstrate a basic knowledge of the physics of fire concerning usual avenues of fire travel, orally, to the instructor.
2. Define the four types of heat transfer, in writing, for the instructor.
3. Demonstrate a basic knowledge of the three phases of burning in fire development, orally, to the instructor.
4. Define explosive range, lower explosive limit (LEL) and upper explosive limit (UEL), in writing, for the instructor.

EXTINGUISHING AGENTS

Course

Extinguishing Agents gives the student the knowledge required to successfully combat all classes of fires, theory and methods of extinguishment, proper use and application, and associated hazards are discussed and demonstrated in the classroom. Students receive "hands on" exposure to most commonly used agents.

Objectives:

1. Explain how firefighting agents extinguish fire and determine the most effective agent to employ.
2. Describe methods of applying extinguishing agents for the most favorable results.

FIRE MAINS, HOSES AND HYDRANTS

Course

This course will explain the care and use of the fire main system and associated equipment including; hose, nozzles, applicators, etc. Procedures for bypassing damaged sections of fire main are described. Students receive practical training on hose handling techniques before attacking several large fires in the training vessel and on the burn pads.

FOAM APPLICATION

Course

Many fires aboard ships involve flammable liquids. This lecture explains the function of foam as a firefighting agent and instructs the student in the proper use of foam production equipment, the proper method of foam applications, the various types of foams and their appropriate uses.

Objectives:

1. Describe the function of fog and foam as firefighting agents.
2. Indicate the distinction between various types of firefighting fog and foam.
3. Explain the proper methods of application of foam using the various foam systems.

PROCEDURES TO FOLLOW UPON DISCOVERY OF A FIRE

Course

This lecture stresses the importance of sounding the alarm and reporting fire location when smoke or flames are first detected. Initial firefighting tactics are discussed, including restricting the fire travel and taking appropriate steps for extinguishment. The Station Bill is emphasized as the basis for a coordinated attack.

Objectives:

1. Outline in detail the elements of the acronym F.I.R.E.
2. Describe the function of the Station Bill.
3. Explain the immediate action of the crew and emergency squad in case of fire.

EQUIPMENT MAINTENANCE

Course

The lecture will include discussion of the proper methods of inspecting and maintaining firefighting equipment.

Objectives:

1. List steps for maintaining firefighting equipment/appliances.
2. Explain the importance of preventative maintenance.

VARIOUS SAFETY AND EMERGENCY EQUIPMENT

Course

The lecture will discuss various safety and/or emergency equipment found aboard vessels, such as combustible gas detectors, and the importance of documents, such as General Arrangement Plan, Firefighting Plan, Dangerous Cargo Manifest, etc.

Objectives:

1. Identify and correctly name the pieces of ships equipment.
2. Identify those documents which are or may be used for the prevention, extinguishment and overhauling of fires.

PORTABLE AND SEMI-PORTABLE EXTINGUISHERS

Course

Portable and Semi-Portable Extinguishers includes a short classroom segment discussing types, maintenance, use and methods of attack. Students then apply this knowledge on a wide variety of challenging live fire situations; outside in open air, and inside the training simulator vessel.

Objectives:

1. Explain the value of portable equipment during the first minutes of a fire, and the importance of a hoseline back-up.
2. Identify the correct type of extinguisher to use on different classes of fire.
3. Demonstrate the proper use and application of various types of portable extinguishers.
4. Calculate specified weights for correct maintenance of CO_2, halon and dry-chemical charges.

DANGEROUS CARGO

Course

Dangerous Cargo discusses various classes of hazardous materials and the inherent dangerous properties of each classification. Fires and spills, and reporting procedures are covered. Students learn to identify potential and existing hazardous substances aboard their own vessel.

Objectives:

1. List the various classes of hazardous materials and explain the dangerous properties of each class.
2. Recite correct methods of inspection, care, handling and stowing dangerous cargo.
3. Identify potential dangerous materials aboard own vessel.
4. Determine procedures for combatting fires and other casualties involving hazardous materials, and for reporting casualties and spills.

SPECIAL SITUATIONS

Course

This lecture is for the purpose of acquainting the students with some of the unusual fire problems on unique and specialized vessels.

Objectives:

1. Demonstrate an awareness of the fire problems presented by barges, oil rigs, L.A.S.H. Vessels, Roll On and Roll Off Vessels, Containerized Vessels and LNG Carriers.

Important Training Center Information

Students participating in fireground exercises must bring with them rubber or work boots. Helmets, gloves and approved protective clothing can be provided by the Training Center. We encourage students to bring the vessle's breathing apparatus to train on, otherwise the Training Center can provide such.

The Fire Training Center is located 12 miles east of North Bend and is reached on Interstate 90 from exit 38. It is definitely "out in the country" and at this time, our support facilities are limited. Students may bring sack lunches with them. A refrigerator and microwave oven are available in the classroom area. Vending machines with sandwiches, soup, coffee or soft drinks are located near the classroom. Lunch MUST be taken on the Center's grounds. Thirty minutes (maximum) are provided for lunch. Our classes start promptly at 0900, unless otherwise specified. Upon arriving at the Training Center, students should report to the classroom marked "Marine Firefighting."

NOTE: Marine Firefighting courses offered at the Training Center are both mentally challenging and physically demanding. Students should be mentally and physically prepared. Before participating in fireground activities, students will be required to sign a Training Center General Release and Indemnification form.

Registration

Class registration forms and room reservations may be requested by calling 1-800-562-6138 (within Washington State) or 206-753-5679 (outside Washington State). Registration forms should be sent to the Olympia office address, at the bottom of the form. More information regarding the Marine Firefighting courses may be obtained by calling the Training Center at 206-888-4523 or SCAN 658-6418.

Garage and Gas Stations locally include:

Arco Self-Service, George Wyrsch
Summer: 6 am - 11 pm.
Winter: 6 am - 10 pm.
No checks. Visa, Mastercharge
Ist. 888-0233

Arco, Ron's Auto Service
Daily 24 hours
Local checks. Visa, Mastercharge, Access, Fuelcard

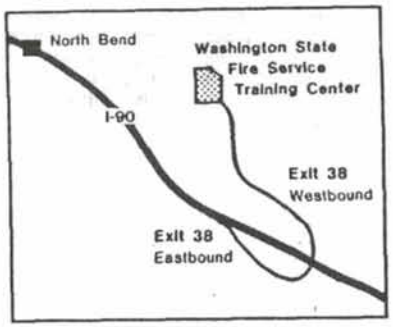
Mobil
Daily 24 hours
No checks. Visa, Mastercharge

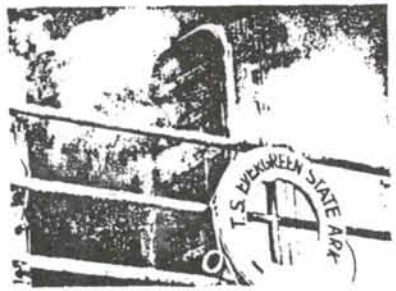
Texaco, Floyd's
Daily 8 am - 8 pm
Local checks. Texaco, Visa, Mastercharge, American Express

North Bend Chevron
Monday-Friday: 6:30 am - 10 pm,
Saturday: 7 am - 10 pm,
Sunday: 7 am - 9 pm
Local checks. Chevron, Visa, Mastercharge
302 1st. 888-0851

Ron's Auto Service
Daily: 8 am - 7 pm
Local checks. Visa, Mastercharge

Ken's Gas - Union 76, Exxon
Daily: 6 am - 11:30 pm
Local checks. Visa, Mastercharge, 76 card
Exit 34. 888-3431





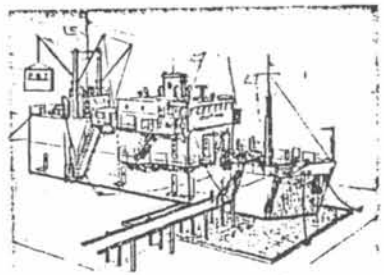
Housing

Commercial room accommodations are available at Issaquah and North Bend. Two motels offer special fire school rates *on request*. Contact in Issaquah, the Holiday Inn at I-90 exit 15, (206-392-6421) or in North Bend, at I-90 exit 34, the Edgewick Inn (206-888-9000).

Sleeping room accommodations are available at the Training Center and can be booked along with course registrations. The individually heated, 2 single-bed rooms have private baths. Students should bring bedding or a sleeping bag, pillow and towel, etc. Alcohol, drugs, and firearms are prohibited.

Additionally, there is space at the Training Center for self-contained campers and trailers, with provisions for septic dump and electricity. Our classrooms are equipped with showers, but students must provide towels and soap.

A pay phone is located by the classrooms for outgoing calls. Incoming calls can be made to 206-888-4523 from 0800 to 1700 hours. Class procedures allow us to take messages which are posted during class breaks. Emergency calls are announced on a paging system.



Washington State Fire Training Center

Coast Guard Approved Marine Firefighting

Course Announcement and General Training Center Information

Washington State Fire Training Center

A unique training site has been established near North Bend. Here, the Washington State Fire Training Center is operated by the State of Washington, Department of Community Development, Fire Service Training. The center provides firefighting training for all Municipal Firefighters in the State, as well as private companies.

Marine Firefighting Program

The Washington State Fire Training Center offers a comprehensive and modern marine firefighting program for officers, seamen, shipping companies, shoreside facilities, and port personnel. These courses include:

Basic Marine Firefighting
Marine Firefighting for Municipal Firefighters
Special Schools and Short Courses
An Advanced Fire Command and Control course is under development.

The U.S. Coast Guard has recognized the 5-day Basic Marine Firefighting Course as an approved training course as outlined in Subpart 10.30, Title 46, Code of Federal Regulations. All instruction follows the Inter-governmental Maritime Organization (IMO) guidelines as well as the Maritime Administration (MARAD) recommendations.

The Basic Marine Firefighting Course, consisting of 16 hours of classroom instruction and 16 hours of fireground exercises, is conducted over 5 days. The Course deals with fire behavior science, capabilities and limitations of extinguishing agents and equipment, safety, self-contained breathing apparatus (SCBA), entry, and search and rescue procedures. Practical applications of classroom principles are taught in a number of challenging fireground applications. Upon satisfactory completion of the Basic Course, including a written exam, students will receive certification that they have received U.S.C.G. approved, Basic Marine Firefighting Course training.

Shorter courses may be developed to address specific marine industry needs. Curriculum for the shorter courses may be taken from the Basic Marine Firefighting Course curriculum or based on specific shipboard problems. The Training Center and staff have the flexibility to meet any requirement of the marine industry.

Our 47 acre site is well equipped. Every type of fire extinguisher is used and in addition, students have ample opportunity to master hose handling while using water and foam to fight class "A" and class "B" fires in the training ship, intensive burn building, or at fireground props which include tank fires, three dimensional fires, leaking pumps, pressurized gas and leaking flanges. Search and rescue problems are taught in a specially designed 6 level high intensity burn building.

The T.S. Evergreen State Ark

Our training ship, (T.S. Evergreen State Ark) encompasses the features of several types of vessels. This landlocked flagship of Fire Service Training contains three decks with an overall length of 147'. When completed, it will have eight sections to provide training in all aspects of marine firefighting. The sections are utilized in different combinations, depending on the level of training being taught.

A two-level engine room is located amidships which features a combination of both steam and diesel propulsion systems. Training on the lower deck includes bilge fires, flange, pipe and fuel line failures. Upper deck problems include: boiler front fires, fuel tank overflows and simulated class C fires in electrical switch panels. Issues of engine room access and escape are addressed as well as confidence-building in the use of self-contained breathing apparatus.

On the bridge deck is the Training Ship's pilot house, galley and CO_2 room. The stateroom provides the opportunity to fight small class A fires and to conduct search/rescue operations. The galley lends experience in deep-fat fryer fires, hood fires, and associated class A and C fires.

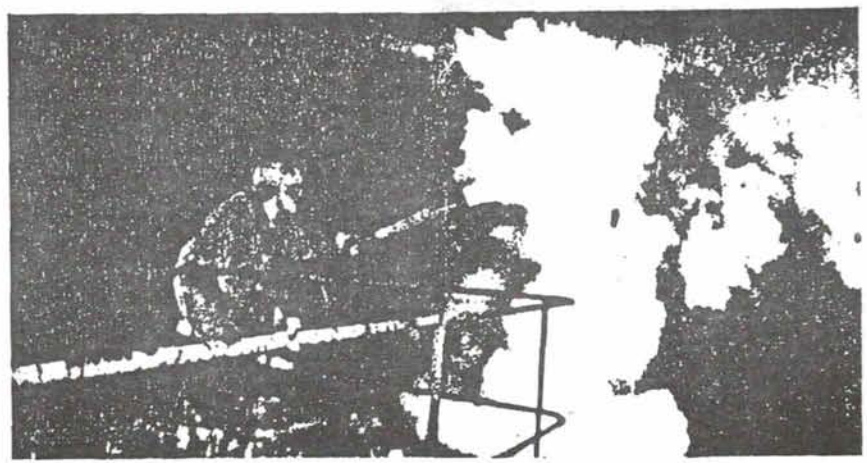
Under Development

A tank-ship bow will provide training in the handling of flammable and combustible liquid fires. The firefighter will receive hands-on experience of deck fires which occur while loading or discharging bulk liquid cargos, as well as cargo tank and pump room fires. This section of the ship will be surrounded by a moat to address the emergency procedures for handling mooring lines, ground tackle, international shore connections, fire and spills on surrounding water and access for shore-based apparatus. The moat will also be part of a Hazardous Materials training site that is being developed around the Training Ship. The hazardous materials site will include various loading docks and aprons, a barge deck, gravel beach and pond, as well as pressurized gas container leak areas, etc.

A cargo hold to be located just aft of the engine room will provide the setting for bulk and break-bulk cargo fires. On the lower level of the hold, students will learn how to use instruments to locate the seat of a bulk cargo fire and proper extinguishment techniques. Training in fighting break-bulk cargo fires will occur in the upper level of the cargo hold and will include CO_2 smothering, hose line attack, access problems, SCBA work and rescue techniques.

Also located on the upper level of the cargo hold will be a damage control compartment which will provide the student with hands-on training in the control of progressive flooding, pipe-patching and plugging, as well as hull damage control, shoring and dewatering procedures.

Booms, cargo winches and a strenuous search and rescue maze will be located aft of the cargo hold at the stern of the ship. A container cell will be placed alongside the stern to acquaint students with specific problems associated with container fires, the use of fixed systems, piercing nozzles, instrument reading and jettisoning containers on fire.



R.V.O.C. Meeting - Seattle
October 4, 5 & 6, 1988

"DEVELOPMENT IN WINCHES"

Mike Markey
MARKEY Machinery Co.
Seattle

Ladies and Gentlemen:

Two years ago in Vera Cruz, I was privileged to take a little of your very hot and well-fed time to talk about Winch Instrumentation. This year Jack Bash has assigned a topic that should be addressed by a couple of dozen people -- each group of engineers involved in the competition to provide you with your vessel's "MAIN BATTERY" has its own history, training, and design ideas. "Development In Winches" could be a week's topic, but only the winch builders themselves would be awake by the end of the first day.

Before plunging into the really HOT topic of "Motion Compensation," there are a few other details to be covered.

SHEAVE SIZE

This has been haggled over for eons, and the sheaves finally installed are always crunched between the cable maker's "druthers" and the economies of space, weight and dollars. We're presently doing a miniature Hydrographic Winch for the City of Los Angeles where the cable supplier, "E.M.Blue", wants 14" root diameter sheaves for its 1/4" 3-conductor cable. That's a 56x proportion.

When squeezed, they said they'd settle for 10" diameter, but 12" would be better. We'll likely go with the ONE METER circ. sheaves, (around 12-3/8" root) and it really won't matter that the three-sheave measuring suite on the fairlead head will dwarf the little winch storing the short cable.

We have copies of an upgraded SHEAVE SIZE SUGGESTION sheet, which you may wish to add to page 8-23 of your "Green Book". Reviewing, I note that we made almost the same "suggestions" available in Mexico -- perhaps a few more of you will get it done this time around. The only current changes have been to add two EM cable sizes and to shift the 5/8" diameter wire from the 1.5 M to the 2 M sheaves. This "cures" the skinniest proportion in the 1986 version.

The next upgrade probably should look at the diameter requirements again, studying the different needs of wire rope versus E.M. cables. It wouldn't be surprising to find a sheave size or two difference. Throw in Kevlar, and the table will need a third section. A multi-purpose winch must provide the sheaves suitable for its toughest application.

ON-WINCH vs. SEPARATE INSTRUMENT SHEAVES

Winch money and winch complexity are savable if the cable metering is done at the overboard sheave or separately, along the cable run between the winch and the A-frame. We were aboard the "Atlantis II" for just a few minutes when she was here a couple of weeks ago, and were reminded that a fairlead head with only a pair of ball-bearinged 8" or 10" stainless rollers is a wonderfully simple device.

Aboard "Oceanus" a recent DESH-5 has this same simple roller-type level-wind fairlead head, while a separate MMCo. cable sensor sheave package turns the wire 90 degrees to head outboard along a boom.

DRUM & RATING CHARTS

We were just getting underway with our early pencil-generated LAYER-BY-LAYER capacity and performance charts back at Al Driscoll's "Green Book Seminars". Since then, the P.C. has replaced the goose quill, and we are attaching two current typical charts.

The overriding message from these charts remains the same;

No "single-line" winch rating statement is meaningful, even if NAVSEA writes it.

Setting up this type of Spreadsheet is freshman computer work, and you should demand at least this level of information from any winch builder.

Chart A shows a "single-geared" DESH-12WF, with the Allen-Bradley /G.E./Stearns AC-SCR/DC drive of 200 h.p. D.C. motors show a "Base Rating" nameplate output, and a higher speed (& lower torque) "field-weakened" output. Actual line speed is of course smoothly controllable from creep to the light-line maximum. Additionally, this particular chart adds columns describing the 15% overload capability of the machine -- something which is always there, but which we normally make only passing reference to. This overload pull condition is shown here because it is being counted on to extract long cores out of the bottom. That's the only time those higher line pulls should be required.

Chart B shows a "dual-geared" DESH-12WF winch with a 250 h.p. AC-SCR/DC drive. The overload data is omitted, but the machine doesn't care, and will draw the additional amps and pull harder if the core is sticky or the line is hung up. This chart reflects a manual gear shift between a "grunt range"and a "maximum speed range".

We still think that the column labled "LIVE LOAD" is more useful to the operator than the winch's pull ratings, since it deducts the non-controllable water-weight of the cable, leaving a more informative sum of PAYLOAD WEIGHT, PAYLOAD DRAG, CABLE DRAG & ACCELERATION FORCES. (each of which the operator can do something about...)

Even with a 250 h.p. drive, this 3/4" machine doesn't have much "Live Load" to work with when it's in fast gear and when the DC motor is reving under minimum field strength. Realistically, this end point on the drive's output curve is only useful for paying out. If the ship's AC buss power were limited, a smaller winch motor would be necessary, and there might not be enough pull available to recover even a bare cable AT THE PEAK SPEEDS. This is what generates the "negative" live loads many of you have seen on our charts.

Don't dispair -- since this end data point is on a "constant-horsepower" hyperbola, the winch will automatically slow down until the torque builds up to allow inhaul. The speed will only reach the "joy-stick-mandated" speed if the load is within the drive's reach.

WINCH CONSTRUCTION MATERIAL

Light weight is great! Aluminum weighs less than steel, whether on a "same scantling" or a "same strength" design basis. You might decide that research winches ought to be made out of aluminum. There are institutions who represent that enthusiasm.

MMCo. has a composite aluminum/steel winch in process. SEA's sailing vessel "Westward" doesn't need any extra weight. It's only a 4 h.p. battery-powered machine, and we're not going all the way with aluminum. The shafts and gearing AND THE DRUM will remain steel, with inorganic zinc coating where it's exposed. This hybrid approach could become general -- if this meeting were a few weeks further out, we could comment on the welding time differences. Since the machine is small, we're providing full scale templates to the aluminum supply house, and they are sawing the pieces to size. In this configuration, the T-6061-T6 pieces are costing us almost $6.00 per pound. Mild steel, burned to template, would be less than 50 cents per pound.

CABLE SPOOLING

For decades now, the "Lebus" grooved shell on a removable winch drum has spooled lots of miles of wire -- some of it perfectly, with a clean, level and uniformly packed lay (the winch builder's dream,) and some of it less perfectly.

(When the lay gets to looking scruffy and uneven, you can look for either a spreading of the drum flanges, for a change in the actual cable diameter, or for an attempt to spool cable under SLACK or light tension. We know of no system, mechanical, servo, laser, feeler, or whatever, that will cleanly spool slack cable. Our best advice is to hire or build a good shore spooling rig, and be sure that EVERY cast has enough weight, either payload or payload plus dummy weight.)

(Another cause might be a wear-shifting of the diamond screw to where it's no longer centered on the drum face. Replace parts or otherwise take up the wear, and adjust the screw or head location so that at each end of the head's travel, it is EQUALLY located relative to the plane of the drum flange.)

O.K., so we're still with "Lebus" -- and the interchangable winch drum. One genuine "Winch Development" is an accelerating interest in ...

DOUBLE DRUM WINCHES,

Each drum would have its own Lebus shell and precise spooling ratio. Outline C-31,964 shows such a "waterfall" unit for a middle-scope of 3/4" wire, and a second size. These drums are realistically too big and awkward to change, either at sea or at dockside, so this drawing shows "fixed" drums. If the winch is below deck, swapping drums gets even less practical.

But assume that the cruise planning requires two cable sizes. Compared to carrying two winches (which, mind you, MMCo. would never object to...), this double drum approach saves one AC-SCR/DC drive package and one level-wind fairleader. The old taboo still says that you never put too lines overboard together, so this double drum "waterfall" configuration can make a lot of sense.

If the two cable sizes are close together, say 1/2" & 0.680", it's reasonable to merely swap the center plate of the measuring sheave, and shift the fairlead ratio clutch when changing wire. If the cable sizes are well apart, say 3/16" and 0.680", then a "side-by-side" layout with two separate fairleads would make better sense. In fact, with that much difference, two winches could remain the right answer.

TRACTION WINCHES

Mr. Bash, or other URI people, ought to comment on these "WINDER PLUS STORAGE REEL" units. We've designed several, but have not built one yet.

With all the attention lavished on maximizing sheave diameter, to be gentle to the cable, our basic concern is the multiple "racetrack" wraps required around the traction sheaves.

The type's two claimed advantages are the ability to store the cable at low tension on the reel, and the fact that output pulls and speeds are constant at all scopes.

This is a good place to point out that this second "advantage" can be mimicked by a "standard winch" by introducing small correction factors to the winch drive for the changing radius of each cable layer. As each pulling drum layer is begun, the drive's microprocessor can add or subtract an increment of torque, and the inverse increment of speed.

Thus, the "standard winch" can be configured to output a constant pull and a constant speed, regardless of scope and working radius.

Additional horsepower is required for this trick, since you must provide a really fast drum rpm for deep scopes, and you have to provide enough torque for the rated pull at the FULL drum. We're not sure this dodge is the answer to the maiden's prayer, but with modern drive technology, it can be accomplished with either the AC-SCR/DC, or with piston type hydraulic drives.

HYDRAULIC DRIVE

This viable alternative ought not to be slighted, although there are now a number of years on a number of the AC-SCR/DC winch drives, from 30 to 75 h.p., and our confidence level in the circuit boards and other electronics is reasonably comfortable.

Still, there are operators who believe that hydraulics can do some things better. 3,000 psi is still a good peak value, though we suppose progress will creep the systems up toward 5,000 psi. This will reduce flows and pipe sizes, and probably increase leaks and hose replacement.

In working out a vessel's energy balance, you can never ignore the power it takes to push hydraulic oil through the pipes, hoses, and orifices. A proven conservative approach is to take the OUTPUT h.p. on the winch cable (lb. pull x ft/min over 33,000) and multiply it by 2.2 to get the input power for the hydraulic pump. The resulting pump drives have stunned a number of hydraulic salesmen, but if you are hardnosed enough, it's a thumb-rule that will keep you out of power shortage trouble.

MOTION COMPENSATION

This is the biggy! We wish we could show you slides or a video of a MMCo. winch on the deck of an R/V in a full gale, with the winch drum "dithering" back and forth while the line calmly pays out or comes aboard at a totally UNIFORM RATE relative to the earth.

We can't! MMCo. hasn't yet built one.

One sees advertisements for winch companies who almost casually offer the feature along with their deck sheaves and inorganic zinc coatings. You see Naval Architects blithely specifying "Motion Compensation" as a simplistic two-word phrase which they presume will allow you to accomplish science as long as you can stand up on the deck. We hear of English and Scandinavian firms who "have offered it for years!"

So, what's the big deal?

Well, the big deal starts with meetings like this one, where everyone involved can agree on what the magic phrase means.

To us, it does NOT mean separate or integral shock-absorbing sub-systems. Those are their own subject, and have their own place.

When we say "Motion Compensation", we should think "whole hog", and envision a payload moving up or down relative to the earth, at a UNIFORM SELECTED SPEED (thus implying a UNIFORM CABLE TENSION), while the ship pitches, rolls, and heaves, (yaw, surge and sway don't matter as much.) in whatever seas the designers have agreed to tackle.

So, you start with a particular hull. And you locate the overboard sheaves in one or more particular places. And you get your friendly Naval Architect to quantify the "Sea State" for you, so that his computer can plot the SPECIFIC MOTIONS at each SPECIFIC SHEAVE LOCATION.

And not to forget the 2nd order coupling effects which one motion can impose on the sheave's response to another motion. e.g. Roll has a vertical effect on a stern frame sheave, even though pitch and heave are the primary drivers.

Vessel course relative to the wave pattern must also be figured in, since without going to "worst case", the job will only be partially done.

When you've done that, and figured out how to write a bid request incorporating that much information, THEN it's time to ask your winch supplier to make a "dithering drum" winch to CANCEL OUT THOSE AGREED MOTIONS.

Accelerometers can be located either near each overboard sheave, or in a lower-risk location if enough geometric parameters are added to the calculation. These can tell a computer what the sheave is doing in space. And the computer can tell the pump drive and winch to give some line if the sheave is rising, and take in some line if the sheave is falling. All superimposed on the operator-determined working speed.

We presume "Pump Drive" because so far it appears that the Motion Comp Winch will have to be hydraulic. Following our participation in the bidding process for NOAA's "Discoverer" machine, we had the late lamented "Nickum/Spaulding" office run through the rotating and linear inertias of a "standard" electric geared winch. Because RPM enters the picture SQUARED, the last thing a winch designer needs is a gear box full of whirling gears and an electric motor and brake spinning between creep and 2,000 RPM.

Outline drawing C-31,751 shows one direction a hydraulic Motion Comp Winch might take. The elements are a LARGE slow hydraulic motor, a low-inertia operating brake, and the drum. The rotating mass of the on-drum wire must be accounted for. (Allow me to skirt the Kevlar issue...)

This particular drawing did NOT include Motion Comp, so it had the normal three-sheave instrumentation suite. For motion comp, the sensors should probably be separate from the winch, leaving the lightest possible fairlead head. The head, after all, has to dodge back and forth as the drum dithers.

What does it take to dither the drum? Depends on your heavy weather ambitions. If a stern frame sheave is moving 30 feet (15 feet above and 15 feet below still water datum), and doing one pure pitch cycle in 12 seconds, the peak cable velocities are in the order of 350 ft/min, and that's just trying to hold the payload STILL in space. (If this were a "paper" we would refer to you Appendix Q, and take 6 more months to write it -- in this case, we won't).

The hydraulic pump is being directed by the computer to slash back and forth over center from in-haul, to payout, even with zero payload speed called for. Add an operator instruction for another 350 ft/min rated hoist or payout speed, and the vector sum of sheave motion and payload motion gives very high drum operating speeds -- in very few seconds!

Totally different numbers arise depending on whether you are working over a beam davit, a stern frame, or through a moon pool. Add the hydraulic pumping losses, and we see VERY HIGH HORSEPOWER pump drives as being inevitable.

All this is surely possible -- it's peanuts compared to so many present day high-tech achievements. Eventually this could be as simple as inserting another disc into the ship's computer -- or better, punching a few different keys. But, in this country at least, it is still early days on the learning curve. For which, read "EXPENSIVE", as any "research & development" is expensive.

Still, vessel time is also EXPENSIVE, and the ability to work the deck for additional hours of science (along with the technical virtue of a uniform sensor motion through the water column) could well drive this Motion Compensation project over the hump into a routine status.

At some point the ability and willingness of the crew to stand erect to handle the gear will just match the ability of the gear to protect itself, and that could be the optimum oceanographic winch outfit.

IN THE MEANTIME ...

Winchs can incorporate their status alarms, and add the alarm-linked servo control features which we mentioned in Mexico.

There is one other "dodge" already available to those of you who have AC-SCR/DC winches. The Allen-Bradley SCR controller has a TORQUE LIMIT ADJUSTMENT, and this can be easily modified for remote actuation.

If you have a 75 h.p. winch drive, you can manually reduce the torque limit to, say, a 22 h.p. value for the particular cast you're doing. The drive will be fooled into thinking it's only a 22 h.p. machine, and its load/speed point will achieve a "SOFT & RESPONSIVE" action in the presense of ship motion. Up-roll tension will slow the drive, and down-roll "slack" will speed the drive up.

This "SOFT RESPONSE" has long been a characteristic of the older Ward-Leonard DC drives, and certainly of steam winch drives.

Granted that finding this "balance" is a "fiddly" process, and might be one which few crew would wish to bother with. But it IS there, and can be made more accessible. It isn't "Motion Compensation," but it may be a way to achieve a degree of "shock absorbing."

Research Winches are exciting devices to design and build, and we hope that they are satisfying devices to operate, at least on most days. They've gotten better over the years, and it looks as though they'll continue to get better. Just as every airplane doesn't have to act like the Concorde, all ocean science doesn't have to be gathered by an "Ultimate Motion-Comp" Research Winch.

As a winch builders PLEA,

We'll leave you with this...

KEEP THE LUBRICANTS CLEAN AND FREQUENT !!

A:RVOCTALK.MJM

1988 SUGGESTED SHEAVE SIZE TABULATION MARKEY Machinery Co.

Wire Diam.	Sheave Pitch Circum.	Pitch Diam.	Root Diam.	Root over Cable
1/8"	1/2 meter	6.27"	6.14"	49x
5/32	1/2 meter	6.27"	6.11"	39.2x
3/16"	3/4 meter	9.4"	9.21"	49x
0.225"	3/4 meter	9.4"	9.18"	40.8x
1/4"	3/4 meter	9.4"	9.15"	36.6x
5/16"	1 meter	12.53"	12.22"	39.1x
0.322"	1 meter	12.53"	12.21"	37.9x
3/8"	1 meter	12.53"	12.16"	32.4x
7/16"	1-1/2 meter	18.8"	18.36"	42x
1/2"	1-1/2 meter	18.8"	18.3"	36.6x
9/16"	1-1/2 meter	18.8"	18.24"	32.4x
5/8"	2 meter	25.06"	24.44"	39.1x
0.680"	2 meter	25.06"	24.38"	35.8x
3/4"	2 meter	25.06"	24.31"	32.4

These recommendations can be inserted at page 8-23 of "Handbook of Oceanographic Winch, Wire and Cable Technology, by Alan Driscoll.

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