Proceedings
of the Marine Safety Council

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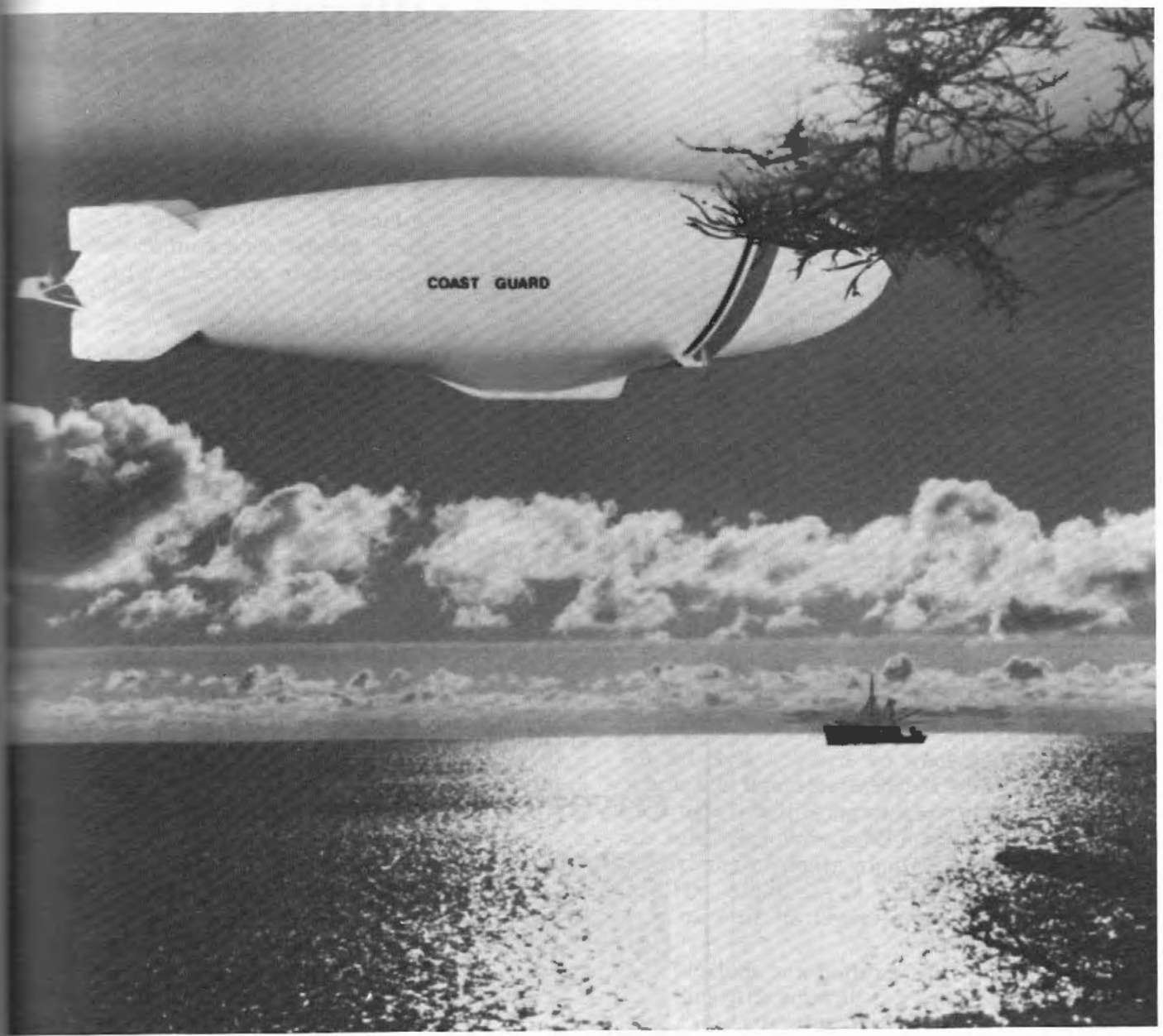

Proceedings
of the Marine Safety Council

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cover

There's a reason why this issue's cover photo looks slightly surrealistic. Since "the Coast Guard Blimp" does not yet exist, the blimp in the photo is an artist's model, based on a Goodyear design. The Coast Guard is presently investigating the possibility of using airships for some of its missions, however, and blimps may be in service by the end of the decade. *For more on the subject, please turn to page 84.*

Coast Guard Retires Last Seaplane

by Petty Officer J. P. Lombardo
First Coast Guard District
Boston

The Coast Guard retired its last fixed-wing, amphibious aircraft March 10, ending an era which dates back to 1915.

Retirement ceremonies were held at the Coast Guard's Cape Cod Air Station. The activities commemorated the last HU-16E Albatross and the other HU-16s.

The last remaining Albatross, number 7250, began its service with the Coast Guard in 1959. Also known by its crews as the "Goat," it joined a fleet of aircraft whose primary mission was search and rescue. In recent years, however, the plane has become a valuable law enforcement tool. Frequent flights have been conducted off the New England coast in search of vessels violating fishing regulations and drug laws.

The last HU-16E Albatross in the Coast Guard flies along the shores of Cape Cod, where it routinely took part in search and rescue and law enforcement missions. Photo by Seaman Norm Whitehurst

As helicopters improved, planes which could land on water became unnecessary. HU-16s made their final water landings in 1972. Their other functions are being taken over by a new fixed-wing jet aircraft, the HU-25A Guardian.

The last pilot to fly the Albatross, Commander Eric J. Staut, has logged over 2,800 hours in the HU-16.

"We asked the HU-16s to do a lot: water landings, jet-assisted take-offs from the water or short fields, 15-hour searches, etc. The Albatross did it all and more."

Lieutenant David E. Elliott assisted Staut as copilot during the Goat's last flight. According to Elliott, it was the HU-16 that made him decide to join the Coast Guard. "Ever since I was a little kid I wanted to fly the Albatross. There is a sort of romantic adventurism in flying old amphibians."

Says Staut, "Countless crews can tell stories pointing out the Albatross' forgiveness of human error. When we were caught and had to penetrate thunderstorms, it got us through. It took us through long water taxies in mountainous seas. Its overtaxed engines kept on turning despite ice or contaminated fuel.

"The Albatross is a survivor, and I feel it took care of its crews more than we took care of it."

Emotions ran high as Air Station crew members lined the runway to render a final salute as 7250 taxied for its final flight—a fitting tribute to an old and trusted friend.

The retired 7250 will remain at Coast Guard Air Station Cape Cod as a permanent monument to Coast Guard aviation history. As Captain Richard O. Buttrick, Commanding Officer of the Air Station, summed it up, "It was a hell of an airplane." ⚓

1990:

It's a bird, it's a plane, — no, it's the Coast Guard *blimp?*

by CDR James L. Webster
Conservation and Advanced Technology Branch
Office of Research and Development

After floating in a life raft for two days, you begin to wonder how much longer you can hang on. Your food and water are running out. The brutal sun is getting to you. You've lost your sense of orientation. Suddenly, you catch sight of a blimp with a Coast Guard racing stripe. "My God!" you think. "Now I'm hallucinating."

But no—if this scene takes place at the end of the decade, you may well be seeing a Coast Guard blimp. The Coast Guard is currently studying airships to see how well they lend themselves to Coast Guard purposes. Whether or not plans for a Coast Guard airship materialize depends on these studies. The lighter-than-air (LTA) craft must demonstrate that the advantages it has to offer justify its price.

The Background of the Coast Guard's LTA Program

Over the past few years, the Coast Guar has been plagued by shortages of resource The authors of the 1982 Coast Guard Roles an Missions Study pointed out that innovativ approaches were needed if the Coast Guard wa to continue to accomplish its major missions.

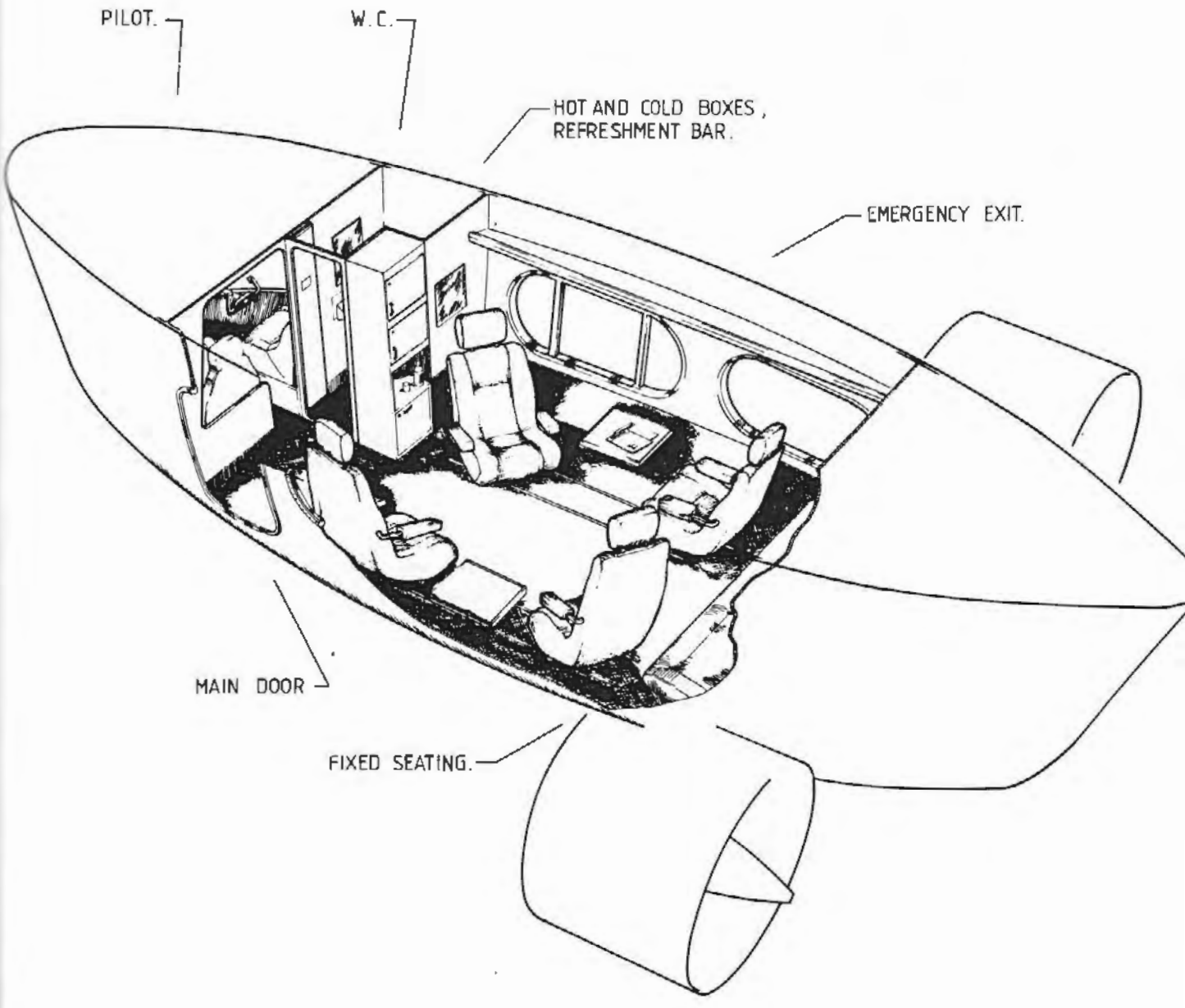
The Coast Guard's monitoring of the 200 mile zone for fisheries management and i patrolling for interdiction of drugs and illeg alien smuggling activities are prime example These missions make heavy demands on Coas Guard resources: cutters are tied up bot during patrol assignments and while they are e route to and from patrols, helicopters, helo capable vessels, and their crews must be mad available to work hand in hand with the cutter and shore-based aircraft are called upon t provide surveillance over large tracts of ocea

and expand the area of control.

Since the early 1970s, the Coast Guard's Office of Research and Development has conducted studies of various alternate means of carrying out many of the Coast Guard's missions. These have ranged from simple kites and parafoils to such sophisticated means as remotely-piloted unmanned aircraft, high-altitude surveillance aircraft, and surveillance by satellite.

The NADC Study

The Coast Guard's major source of information on the application of lighter-than-air craft, or airships, to its missions is the "Maritime Patrol Airship Study" conducted by the Naval Air Development Center. NADC did a mission analysis comparison between airships and the ships, aircraft, or ship/aircraft teams that would be needed to accomplish the same mis-



The gondola of the ship envisioned for Coast Guard use would seat six.

sions.

A quick look at fuel consumption rates points to the airship as the clear winner. There is more to it than that, however. Since the airship may take several times as long as a fixed-wing aircraft to fly the same mission, cost per mission is a better standard of comparison. In a mission-for-mission comparison, the airship was found to consume half the fuel of the H-3 helicopter and HU-25 fixed-wing aircraft, one fifth the fuel of the C-130 long-range search aircraft, and one sixth the fuel of either the 210- or the 378-foot cutters.

The ship being leased by the Coast Guard was tested in the London dock area to see whether it could land and take off in small, congested areas.

In addition to fuel costs, operating costs of a "mission platform" (the Coast Guard's umbrella term for the means of transport from which a mission is conducted) include acquisition costs, capital investment in real estate and facilities, and personnel, training, and maintenance costs. The cost of operating the various Coast Guard mission platforms over their expected service lifetime weighs heavily in decision making.

NADC used a specially written computer program to estimate the operating costs for airships. These findings were combined with known data on the other types of platforms to come up with relative dollar costs for the different Coast Guard platforms. The airship came off well in this more comprehensive cost comparison. The hourly operating cost of the 210-foot cutter is about 15 percent lower than that of the airship, but the airship can perform a larger range of missions. The airship costs 15 percent less to operate than the new Falcon medium-range search aircraft, half of what it costs to operate 378-foot cutters and the C-130 long-range search aircraft, and 70 percent less than the H-3 medium-range helicopter.

NADC also looked at mission capability. It found that the airship could perform long-endurance missions beyond the capability of helicopters and some vessels and that it could interact with surface units more directly than fixed-wing aircraft. These missions were within the abilities of the larger vessels but, with an airship, could be done in half the time with one sixth the fuel. The airship does not appear to threaten the existence of either ships or aircraft but could be a way to complement both by relieving them of some of their operations.

The NADC study covered the entire spectrum of potential missions that could be performed by airships: Enforcement of Laws and Treaties, Search and Rescue, Marine Environmental Protection, Port Safety and Security, Marine Science Activities, Ice Operations,

Short Range Aids to Navigation, and Military Operations. The versatile blimp is suited to everything from responding to oil spills to serving as a convoy escort or engaging in minesweeping operations.

The AI-500

Currently, the U.S. Navy and the U.S. Coast Guard are working on a joint project to further their technical know-how and develop an airship system for Navy and Coast Guard needs. They are using an existing, off-the-shelf airship and the most modern technology available to evaluate both technical characteristics and operational capabilities.

The project is well underway. A contract was signed between the Navy and Airship Industries Ltd., of Great Britain, on January 20, 1983, for the leasing of the latter's model AI-500 airship. The AI-500 is in the same size class as the Goodyear Blimp. Although it is 10 percent smaller by volume, its payload capacity by weight is 40 percent more. This efficiency is achieved by the use of vectored thrust propulsion and lightweight, modern materials such as dacron/mylar for the envelope and a rigid structure of glass-reinforced plastic and suspension cables of kevlar. (The nearly exclusive use of nonmetallic components in the AI-500 produces a vehicle with a very small radar signature—a "stealth blimp").

Seeking a North American location for assembly, the developer decided on Toronto when the Canadian government offered to provide a hangar and the use of two C-130 transport aircraft. The AI-500 envelope and most of the other components and support equipment were transported to Toronto for initial assembly and inflation with helium in December 1982. The tail fins and gondola were shipped in January. Assembly and inflation will have been completed by March 30, 1983. The airship will then be flown to North Carolina.

The contract calls for a period of flight operations in the vicinity of Elizabeth City, North Carolina, lasting from the first of May to approximately the tenth of July. During the evaluation program, the airship will operate out of the nearby Weeksville blimp base. This base consists of two blimp hangars which served as the site of extensive U.S. Navy airship activity up until the mid-1950s.

Broader Application

The evaluation program will take into account several particular aspects of the AI-500 with a view toward applying the results to airships in general. The AI-500 is actually quite small compared to the vehicles that would be needed to effectively pursue Coast Guard missions. Speed and endurance, in particular, fall considerably short of what would be required. However, by conducting these tests, the Coast Guard hopes to answer some basic questions about airship characteristics, capabilities, and costs. It can then develop its findings into predictions for a full-size maritime patrol airship ("MPA") incorporating the best of modern technology.

NADC defined just such an MPA in its study. The following table compares the AI-500 and a hypothetical mission-capable MPA.

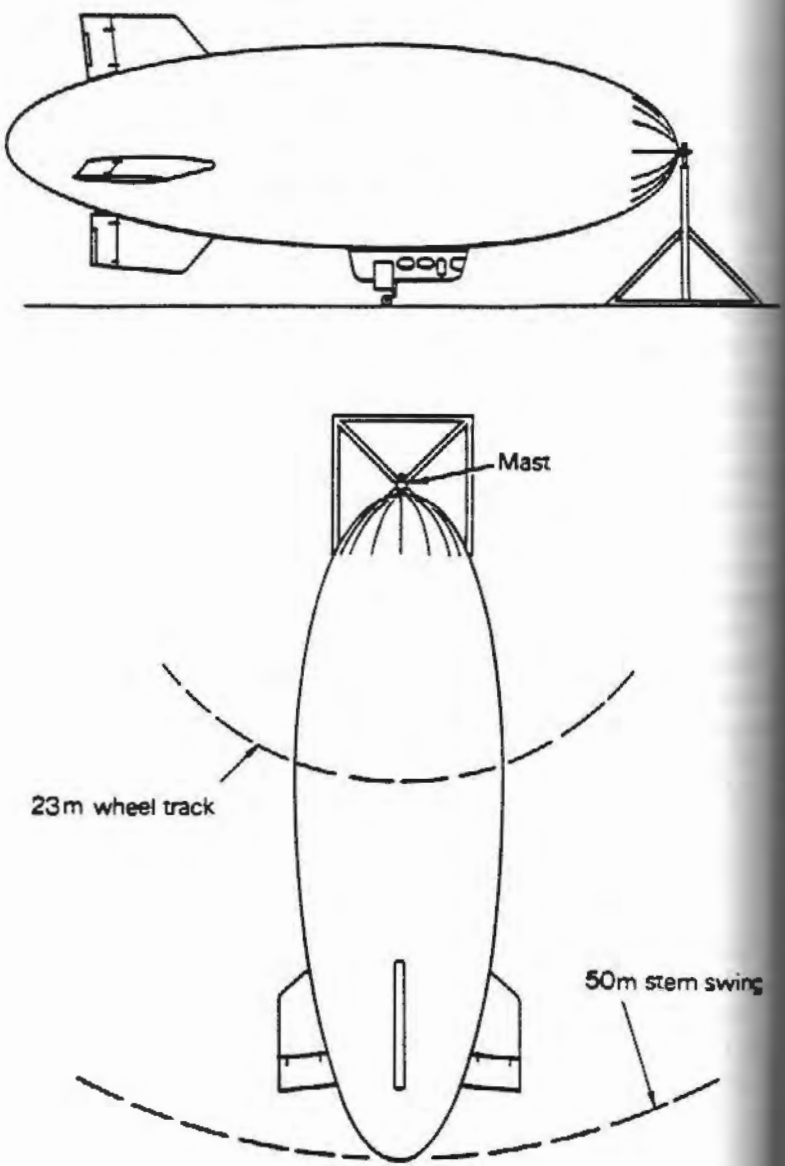
	AI-500	MPA
Length	164 feet	324 feet
Envelope volume	181,200 cu. ft.	875,000 cu. ft.
Diameter	46 feet	73.4 feet
Lift from helium	10,150 lb.	52,164 lb.
Maximum gross weight	11,550 lb.	60,644 lb.
Useful load	4,400 lb.	22,500 lb.
Maximum altitude	9,500 feet	10,000 feet
Horsepower	408	2,400
Maximum speed	55 knots	97 knots
Cruise speed	45 knots	60 knots
Cruise fuel consumption	80 lb./hr.	300 lb./hr.

Future Program Plans

During the AI-500 test flights, researchers will be gathering data in a number of areas. They will be studying dynamic characteristics to determine the airship's response to wind gusts and the effectiveness of the control and propulsion systems during critical landing maneuvers, hovering, and the launch and retrieval of a small boat. The quality of the ride, safety, and vibration levels will be monitored, as these factors could cause fatigue or anxiety among crew members, thus reducing a mission's effectiveness. Finally, radar performance and the airship's ability to use night-vision devices for effective 24-hour surveillance will be evaluated.

NASA, at its Ames Research Center at Moffet Field, California, will use the data collected on dynamic characteristics to validate its recently acquired computer simulation program. In the future, the Coast Guard will be able to use this simulation program to analyze any size airship with virtually any number and configuration of power plants, both moored and in flight. (Conditions during mooring are important because an airship is hooked onto a mast—such as the one on top of the Empire State Building—by its nose cone; this leaves the bulk of it subject to the forces of gusty winds.) When candidate designs are eventually developed for a Coast Guard patrol vehicle, the designs will be tested on the simulator for the same factors being monitored by NASA during the test flights on the AI-500.

The test results will give an initial indication of the eventual capabilities of full-size vehicles. The Coast Guard hopes to be able to draw on the study results in future efforts to develop an optimum vehicle for accomplishing its many missions.



In a typical mooring scheme, the nose of the airship is locked into the mast; the ship is then free to rotate with shifts in the wind. A moored airship requires around-the-clock attention to ensure that inside pressure is maintained.

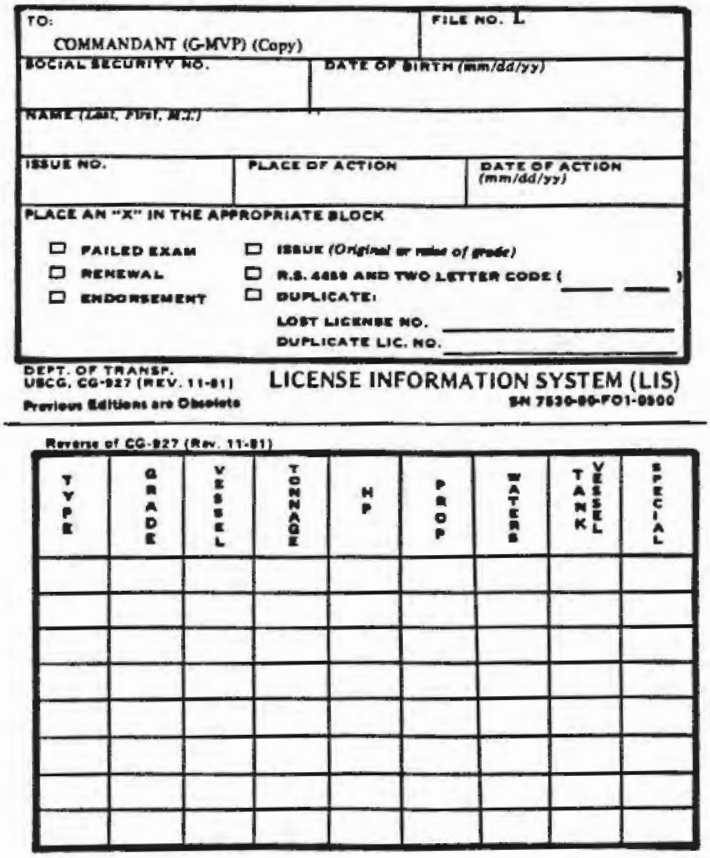
Merchant Marine Personnel Statistics

The Coast Guard has changed the way it compiles its statistics.

The License Information System (LIS) is a computer file-management system which was started on September 1, 1981. The LIS replaces the old manual system, which consisted of 3" x 5" index cards. The License Information System provides faster and more accurate searches for records and serves as a data base for compiling license statistics.

The complete license file of an individual is maintained at the Marine Safety Office at which application for a particular transaction was made, and key information from each license transaction is forwarded to and maintained at Coast Guard Headquarters in Washington, DC. The forwarded information consists of the following: Social Security number, date of birth, name, issue number, place of action, date of action, type of transaction, and an alpha code of the type of license issued. *See Figure 1 for a sample of an input card. See Figure 2 for a sample of output, as it appears on the LIS computer.)*

In the past, statistics were compiled on a fiscal-year basis (October 1 to September 30). Licensing statistics will now be figured on a calendar-year basis, starting with this report. The following tables reflect the transition and include figures from the last quarter of Fiscal Year 1982 (October - December 1981) as well as calendar year 1982, as noted.



TO: COMMANDANT (G-MVP) (Copy) — FILE NO. L

SOCIAL SECURITY NO. — DATE OF BIRTH (mm/dd/yy)

NAME (Last, First, M.I.)

ISSUE NO. — PLACE OF ACTION — DATE OF ACTION (mm/dd/yy)

PLACE AN "X" IN THE APPROPRIATE BLOCK

- ☐ FAILED EXAM
- ☐ RENEWAL
- ☐ ENDORSEMENT
- ☐ ISSUE (Original or raise of grade)
- ☐ R.S. 4450 AND TWO LETTER CODE (____ ____)
- ☐ DUPLICATE:

LOST LICENSE NO. _____

DUPLICATE LIC. NO. _____

DEPT. OF TRANSP. USCG. CG-927 (REV. 11-81) Previous Editions are Obsolete

LICENSE INFORMATION SYSTEM (LIS)

SN 7530-00-FO1-0900

Reverse of CG-927 (Rev. 11-81)

TYPE	GRADE	VESSEL	TONNAGE	HP	PROP	WATERS	TANK VESSEL	SPECIAL

Figure 1 Sample input card for the LIS

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                    LICENSE INFORMATION SYSTEM (LIS)

 Z NUMBER ... .. ....      DATE OF BIRTH (MM/DD/YY)  .. / .. / ..

 LAST NAME ..................  FIRST NAME ..............  MID INIT .

        PLACE AN 'X' BENEATH THE TYPE OF RECORD YOU ARE ENTERING
                                                          DUPLICATE/
 ISSUE          RENEWAL          ENDORSEMENT      FAILED EXAM  RS4450 & CODE
  .               .                 .                .            .  ( .. )

                  PLACE                ACTION      T  G  V  T     P  W  T  S
 ISSUE             OF                  DATE        Y  R  S  O  H  R  T  N  P
 NUMBER          ACTION          MM / DD / YY     P  D  L  N  P  P  R  K  L

 .. - ..          ...             .. / .. / ..     .  .  .  .  .  .  .  .  .
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Figure 2 Sample output as it appears on the computer screen

Merchant Marine Officer Licenses Issued

Deck

	Oct-Nov-Dec 1981		Calendar year 1982	
	Issues	Endorsements	Issues	Endorseme
Master, Any Gross Tons, Oceans	49	21	144	34
Master, Great Lakes	0	1	23	4
Master, Coastwise	1	0	3	1
Master, Limited Tonnage	2	1	10	7
Master, Uninspected	18	8	139	31
Master, Fishing	11	2	18	12
Master, Ferry Vessels or MODUs*	5	0	25	0
Master, Freight and Towing Vessels	61	10	252	68
Master, Mineral and Oil Vessels	148	25	574	278
Chief Mate	62	7	204	45
Chief Mate, 1,600 Gross Tons	7	1	20	5
Second Mate	90	2	356	26
Third Mate	54	11	532	23
Mate, Uninspected Vessels	7	3	39	13
Mate, Fishing Vessels	8	0	9	1
Mate, Ferry Vessels or MODUs	0	0	4	0
Mate, Mineral and Oil Vessels	45	4	203	24
Mate, Freight and Towing Vessels	6	5	47	23
Operator of Uninspected Towing Vessels	393	69	998	314
First Class Pilot	67	129	218	539

* MODU - Mobile Offshore Drilling Unit

Engineer

	Oct-Nov-Dec 1981		Calendar year 198	
	Issues	Endorsements	Issues	Endorsem
Chief Engineer, Motor	15	19	69	85
First Assistant, Motor	20	4	60	42
Second Assistant, Motor	21	9	136	57
Third Assistant, Motor	92	6	409	29

	Issues	Endorsements	Issues	Endorsements
Chief Engineer, Steam	23	8	124	20
First Assistant, Steam	50	5	229	10
Second Assistant, Steam	97	7	364	12
Third Assistant, Steam	37	2	142	8
Chief Engineer, Steam & Motor	5	5	26	8
First Assistant, Steam & Motor	3	3	6	5
Second Assistant, Steam & Motor	6	3	56	6
Third Assistant, Steam & Motor	22	2	665	5
Chief Engineer, Uninspected Vessels	39	6	154	69
Assistant Engineer, Uninspected Vessels	17	2	83	6
Chief Engineer, Mineral and Oil Vessels	6	1	109	39
Assistant Engineer, Mineral and Oil Vessels	1	0	8	3
Chief Engineer, Fishing Vessels	3	6	8	9
Assistant Engineer, Fishing Vessels	3	0	7	0
Chief Engineer, Ferry or MODUs	1	1	17	5
Assistant Engineer, Ferry or MODUs	3	1	3	0

Staff Officer Certificates of Registry Issued

	Oct-Nov-Dec 1981	Calendar year 1982
Surgeon	7	18
Professional Nurse	2	4
Chief Purser	4	18
Chief Purser/PYA*	1	3
Chief Purser/HM**	0	3
Purser	3	12
Purser/PYA	0	1
Purser/HM	0	0
Senior Assistant Purser	4	4
Senior Assistant Purser/PYA	0	0
Senior Assistant Purser/HM	0	1
Junior Assistant Purser	8	38
Junior Assistant Purser/PYA	0	0
Junior Assistant Purser/HM	0	3

* PYA - Physician Assistant

** HM - Hospital Corpsman

Operator Licenses

	Oct-Nov-Dec 1981		Calendar year 1982	
	Issues	Endorsements	Issues	Endorsements
Ocean Operator	481	132	2,071	592
Inland Operator	186	38	1,089	173
Motorboat Operator	322	40	2,186	195

Radio Officer

	Issues	Endorsements	Issues	Endorsements
Radio Officer	11		37	

Summary of All License Transactions

	Oct-Nov-Dec 1981	Calendar year 1982
Total Transactions	6,871	33,125
Number of Individuals Processed	5,265	23,914
Total Deck Officer Renewals	897	4,032
Total Engineer Officer Renewals	870	3,803
Total Radio Officer Renewals	67	287
Total OUTV* Renewals	192	1,036
Total Operator, MBO** Renewals	564	3,360
Total of All Renewals	2,590	12,518
Total Issues (Originals and Raise of Grade)	2,527	11,962
Total Endorsements	599	2,826
Total Failures, all categories	1,155	5,819
Radar Observer	347	1,510

* OUTV - Operator, Uninspected Towing Vessel
** MBO - Motorboat Operator

NOTE: Radar observer is not included in the totals, since this endorsement is included with the basic license.

NOTE: The endorsement column reflects any type of change or addition to the basic license.

Original Merchant Mariners Documents Issued

QUARTER	ATLANTIC COAST	PACIFIC COAST	GULF COAST	GREAT LAKES REGION	TOTAL
Oct-Nov-Dec '81	687	639	1,556	185	3,067
Jan-Feb-Mar '82	715	708	1,714	258	3,395
Apr-May-Jun '82	1,682	549	1,487	250	3,968
Jul-Aug-Sep '82	1,078	521	1,495	140	3,234
Oct-Nov-Dec '82	317	313	742	154	1,526
TOTAL	4,479	2,730	6,994	987	15,190

Original and Additional Endorsements Issued

October 1, 1981, through December 31, 1982

	ATLANTIC COAST	PACIFIC COAST	GULF COAST	GREAT LAKES REGION	TOTAL
AB—any waters, unlimited	334	188	985	66	1,573
AB--any waters, 12 months	205	258	692	69	1,224
AB—Great Lakes, 18 months	150	195	629	118	1,092
AB—other	136	99	299	18	552
Lifeboatman	912	360	330	62	1,664
Electrician	271	164	78	39	552
Oiler	338	196	197	68	799
Fireman/Water tender	375	157	79	70	681
Other Q.M.E.D. ratings	1,116	688	570	358	2,732
Tankerman	420	356	721	585	2,082
Entry Ratings and Steward's Department	5,628	2,672	4,727	1,473	14,500
TOTAL	9,885	5,333	9,307	2,926	27,451

Sidelights:

Where should you put them in a barge configuration with uneven sides?

Proper placement of sidelights on groups of vessels being pushed ahead or towed alongside was one of the subjects discussed by the Rules of the Road Advisory Council (RORAC) at its December 7 - 8, 1982, meeting.

Rule 24(f) of the Inland Rules states that any number of vessels being towed alongside or pushed in a group shall be lighted as one vessel. This Rule further requires that sidelights be exhibited at the forward end of the vessel.

Many questions have been raised concerning sidelight placement on various barge configurations encountered on the Western Rivers. Frequently, groups of barges are unevenly configured; placement of sidelights on the forward end of the lead barge(s) of a tow may thus give a false indication of the maximum width of the tow. Operators on the Western Rivers unanimously agree that sidelights are most useful when they mark the maximum projection of a tow to both port and starboard. On vessels being pushed ahead, the special flashing light required by Rule 21(g) adequately marks the forward end of the tow.

RORAC has interpreted Rule 24(f) as requiring

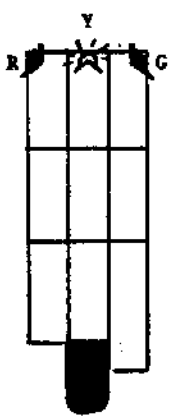
- a green sidelight on the starboard side of the tow, so placed as to mark the maximum projection of the tow to starboard, and

- a red light on the port side of the tow, so placed as to mark the maximum projection of the tow to port.

The Coast Guard agrees with this interpretation. The illustrations show proper lighting on some representative Western Rivers barge configurations. It should be noted from the figures that where there is a combination of pushing ahead and towing alongside, a sternlight should be placed on the vessel towed if its stern nears or falls aft of the stern of the towing vessel.

Examples of Sidelight Placement

on Representative Western Rivers Barge Configurations



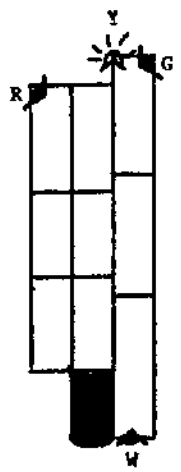
R – red sidelight

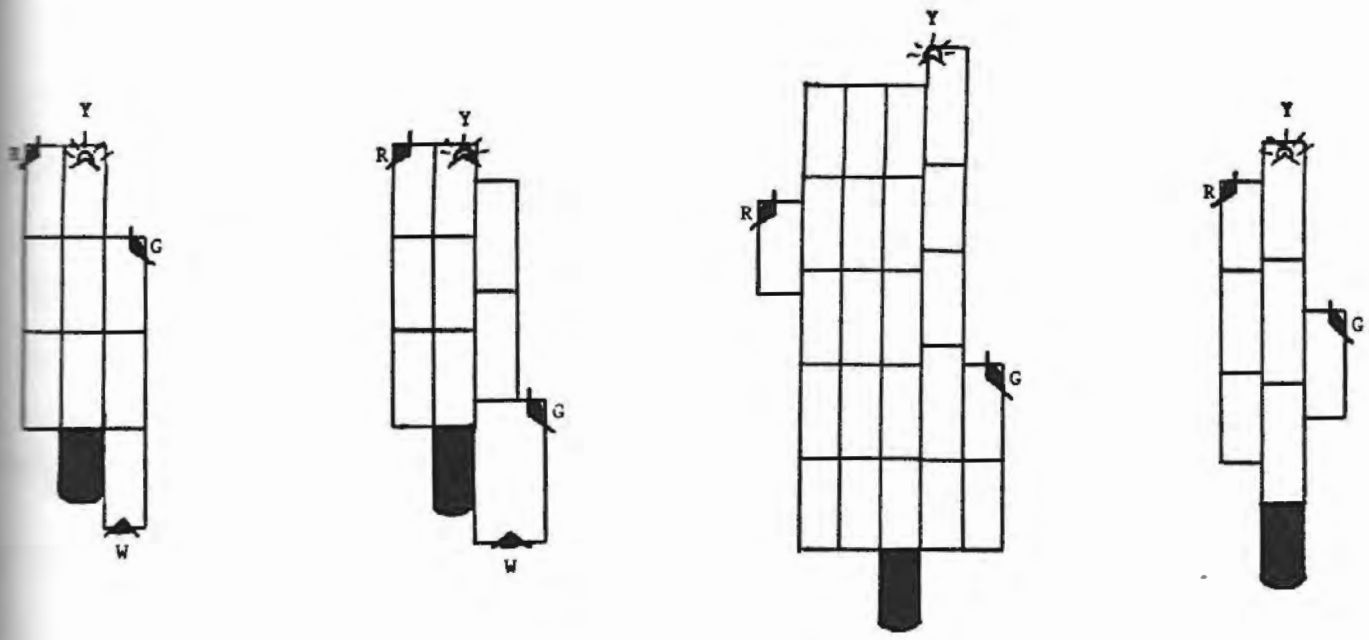
G – green sidelight

Y – special flashing light (yellow)

W – sternlight

– towing vessel





Ship Design

A new reference work covers the second phase of structural analysis.

The Ship Structure Committee is pleased to announce the availability of *Ship Structural Design Concepts: Second Cycle*. This 500-page, hard-cover volume was written for the Committee by MIT's Professor Emeritus J. Harvey Evans.

Ship Structural Design Concepts: Second Cycle is an extension of an earlier volume entitled *Ship Structural Design Concepts* published in 1974. These two volumes, which furnish a complete and detailed account of structural analysis during the early stages of ship structural design, represent the culmination of Professor Evans' many years of teaching.

The new volume addresses topics which are of importance during the second cycle of ship structural design and which would not be considered in detail during the first cycle.

Covered in the new volume are: shear stresses associated with bending, including solid rectangular cross sections, composite beams, thin-walled sections and open-hatch sections; torsional effects, including solid cross sections, thin-walled open sections, thin-walled closed sections, warping of thin-walled unrestrained sections and effects of warping restraint; hull-deckhouse interaction, including main-deck stiffness, shear effects, deckhouse geometry, experiments and theory; principal stresses in the hull girder, including Mohr's circle analysis, theories of strength, distributed loading, concentrated loading and effects due to changes in beam proportions; hull girder deflections and stiffness, including built-in and in-service distortions, thermal effects, elastic deflections, and deflections as a measure of stiffness; full-scale longitudinal strength experiments, including static and dynamic tests; and preliminary choice of framing systems, including problem definition, panel loadings, alternative arrangements, and some historical perspectives.

The new book was reviewed, chapter by chapter, as it was being written, by the Society of Naval Architects and Marine Engineers' panel on Design Procedure and Philosophy. It is being published by Cornell Maritime Press, P.O. Box 456, Centreville, Maryland, 21617; tel.: (301) 758-1075. The list price is $45.00. Cornell Maritime Press also has copies of the first volume, *Ship Structural Design Concepts*, available at the same price. ‡

On the lighter side . . .

Some years ago *MAD (yes, readers, MAD)* came up with the following glossary. Readers who ar feeling ASTERN (see below) should skip this page and go on to the next article.

A Glossary of Nautical Terms

The two terms most commonly used in boating are **"PORT"** and **"STARBOARD."**

PORT - Facing the bow, "Port" is on your left. It is easy to remember: "Port" has "four" letters and "Left" has "four" letters. So "Port" is "Left."

STARBOARD - Since there are only two sides on a boat, and Port is one of them, it is obvious clear that the other one is left. "Starboard" is left.

Other Necessary Nautical Terms

AHEAD - The nautical term of "ajohn."

ASTERN - Without humor, i.e., "The Captain told no jokes. He was astern Captain."

AMIDSHIPS - This condition exists when you are completely surrounded by boats.

ANCHOR - What you display when you find you're completely surrounded by boats.

BERTH - The day on which you were born.

BUNK - Phony sea story.

BUOY - A buoy is the floating device you always smash into when trying to avoid the submerge obstacle the buoy is there to warn you about.

CHANNEL MARKER - Tells you which station you're tuned into on your TV set.

DINGHY - The sound of a ship's bell, i.e., "Dinghy-Dinghy—Dinghy-Dinghy."

DISPLACEMENT - Accidental loss, i.e., when you dock your boat and later you can't find it again you've displaced it.

DOCK - Nickname for a medical man.

EDDY - Nelson's last name.

HEAVE-HO - What you do when you get seasick and you've eaten too much ho.

HITCH - The thing to look for when a millionaire invites you on his boat . . . especially if you're female.

KEEL - What your wife does to you when she finds you've bought a boat.

LAUNCH - The meal eaten aboard a boat at about noontime.

MOOR - Number of people needed for a boat-party, like "The moor, the merrier!"

OAR - When you have a choice, like "This . . . oar that!"

PORTHOLE - A hole in the left side of a boat--or is it the right side?

QUARTER-DECK - The floor on a cheap boat, which cost about 25¢ to install.

SHOAL - Worn by female sailors on chilly nights.

TIDE - A commercial detergent.

SUPERSTRUCTURE - A structure that's a lot better than the one on your boat.

WAKE - What friends attend when you've been careless with your boat.

(I knew we could work safety in there somehow - Ed.)

Re-radiated Loran Signals Studied by Office of Research and Development

Loran-C radionavigation users have sometimes noticed significant errors in their receiver readings when near large bridges. The errors have been attributed to "re-radiation": that is, the creation of unwanted new signals coming from the bridge structure. These are caused by small electric currents generated by Loran transmissions.

Like other radio signals, Loran transmissions are electromagnetic waves. To some extent, all electromagnetic waves coming in contact with metal produce electric current. This, in turn, results in new electromagnetic waves. The second, or "re-radiated," signal then obscures the original signal.

The Coast Guard's Office of Research and Development has just finished evaluating the causes of this problem and possible means of avoiding it. A small-scale model of a bridge was fabricated for use in a radiation test facility at the University of Michigan Radiation Laboratory.

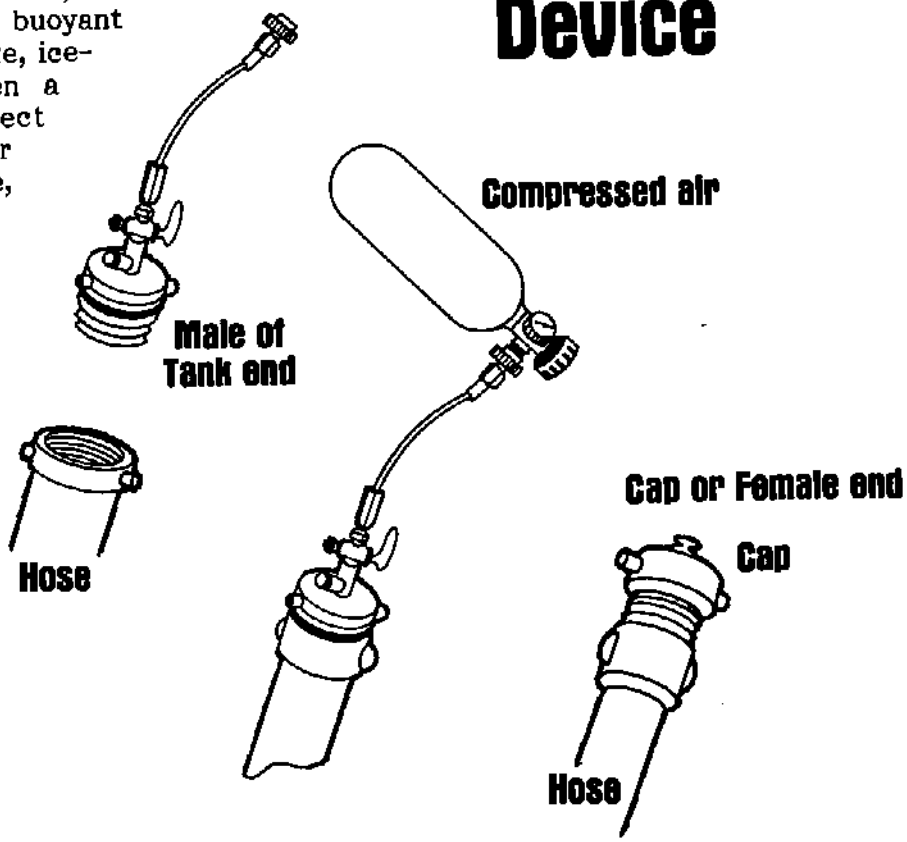
Measurements were taken of re-radiated signals from the model bridge in the presence of signals comparable to Loran-C. Test results showed to what extent Loran-C is affected by bridges. The most troublesome bridges were found to be those with center-span lengths just under one mile. The results also apply to other re-radiating structures, including overhead or underwater cables.

The researchers examined methods of eliminating re-radiation effects and concluded that they were impractical. The implication is that mariners should be very careful when using commercially available Loran-C navigators which use Loran-C data predicted from some analytical model, as opposed to carefully surveyed numbers.

A report of this study has just been published. The report is entitled "Study of Loran-C Re-Radiation in a Harbor Environment." It can be obtained from the National Technical Information Service, Springfield, Virginia 22161, by specifying Report No. CG-D-37-82, Accession No. AD A120-624. ‡

Hose Rescue Device

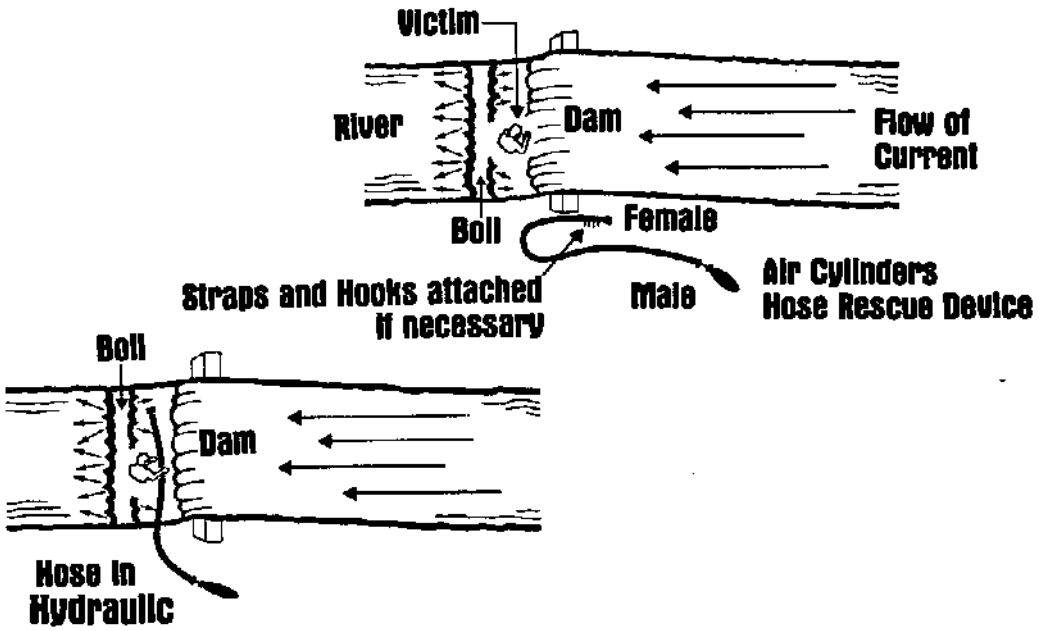
The December 1982 issue of the *Proceedings* included an article about using fire hose as a rescue device *(page 344)*. The hose, once filled with air, becomes rigid and buoyant and can be pushed into a river, lake, ice-covered body of water, or even a hydraulic created by a dam to effect a rescue. The National Water Safety Congress, Inc., of Burke, Virginia, includes sketches of the device and its use in its student workbook on Search and Rescue. The sketches shown here are reproduced with permission from The National Water Safety Congress - SAR Training Kit.



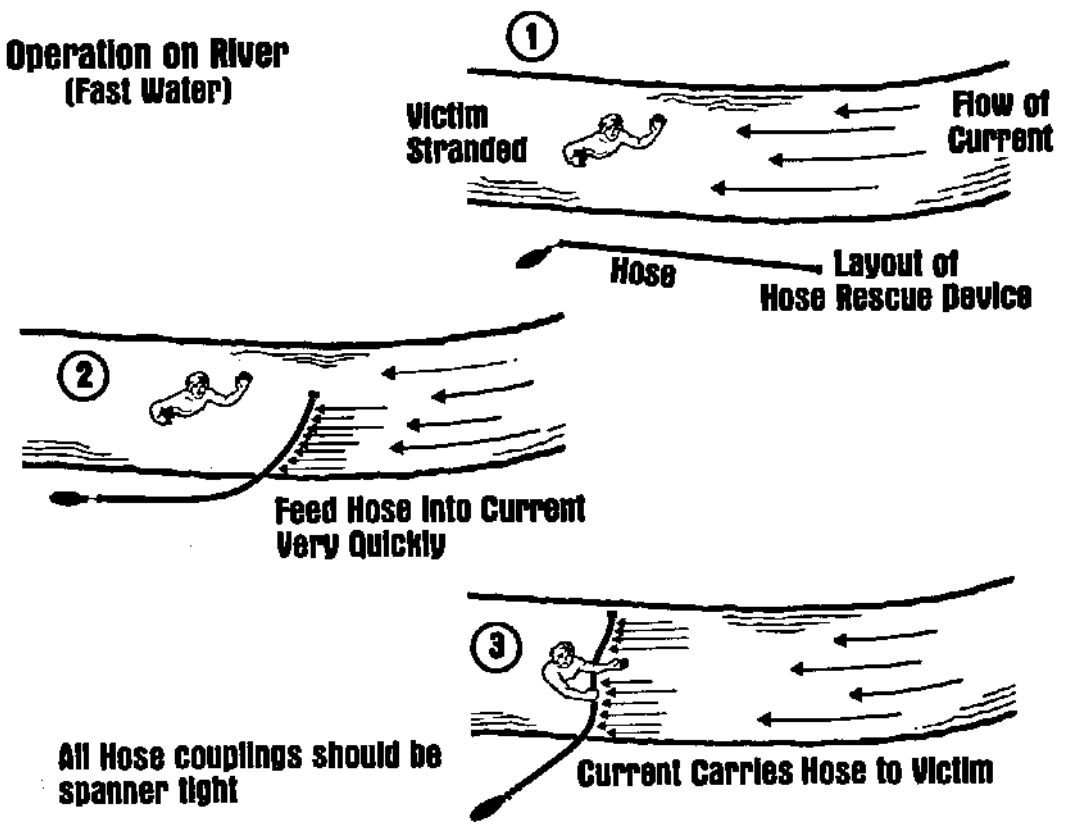
Hose Rescue Device may consist of the following:

a. 2 - ½" Female cap
b. 2 - ½" Male cap with 18" flexible ½" hose
   ½" Flexible hose has quick connect coupling for air cylinder
   The Shut-off is near the 2 - ½" coupline (Male)
   Relief valve is set at 120 psi
c. 2 - ½" or 3" hose from an engine
d. Rope to assist in guiding hose
e. Hooks (for the purpose of snagging unconscious victims or bodies
f. Hose straps (to attach hooks)

Operation at Hydraulic



Operation on River (Fast Water)



Letters to the Editor

More on the "flammable"/ "inflammable" controversy

As correctly indicated by LT Kremer of the Cargo and Hazards Branch *(Letters, January 1983)*, "inflammable" is used in SOLAS, 1974, and in Title 46 of the Code of Federal Regulations. Should LT Kremer, or anyone else for that matter, care to look further, "flammable" and "inflammable" are clearly stated in the Code as "interchangeable or synonymous terms for the purpose of the regulations" (46 CFR 30.10-21). In addition, no less authority than the United States Code uses the term "inflammable" and implies therein its synonymity with "combustible" (46 USC 391a(2)(A)). Last, but not least, the term's presence in texts, for example, on tank vessel safety, would indicate its common use in the maritime industry.

The employments of "inflammable" mentioned here all reflect the definition given in every standard dictionary of the English language. There can be no question that to ignore the presence of a word which is used as is "inflammable" or to decide, for the purposes of Institute examinations, that it simply does not exist, would seem rather arbitrary. In the interest of safety, it would seem wise to require that people know what it means, lest they, at some time, make the catastrophic assumption that if something is inflammable, it will not burn and, therefore, is safe around heat and flame. The Coast Guard is still in the safety business.

LCDR M. T. Woodward
Chief, Merchant Vessel
Personnel Division
U.S. Coast Guard
Institute
Oklahoma City, OK

I agree that the importance of knowing that "flammable" and "inflammable" are synonymous overshadows the question of which word is used on Institute exams. For their own reference, readers may wish to note that 46 USC 391a was revised as a result of the Port and Tanker Safety Act of 1978. The term "inflammable" was replaced by "flammable" at that time--Ed.

Ogden Nash put the ["flammable"/"inflammable"] problem in perspective in a verse from his poem entitled "Philology, Etymology, You Owe Me an Apology":

The More I gross less young
The More I grow bewildered by
my mother tongue.
There are words that bring me
up short, subpoena-like,
Because they look different
but then turn out to mean
alike.
If anyone wants proof,
Let me point out one such
booby trap or spoof.
It is familiar to any motorist,
who, a few years ago, found
his progress impeded by a
crawling truck which was
unfortunately not rammable
Because its behind bore the
ominous word, Inflammable,
Today the same motorist finds
the same truck still
unrammable,
But this time because it is
labeled Flammable.*

I am afraid the problem will never be resolved, since the English language is not noted for its consistency. But, on the other hand, would we enjoy a language that is consistent--Oh, to be a Frenchman or, better yet, a Roman!

Charles L. Keller
Marine Field Service
Specialist
National Fire
Protection Association

Computers for processing merchant marine personnel?

Frankly, the thought of having to deal with a computer instead of a human being is discouraging at best. The applications of computers seem to be multiplying like rabbits in every industry. Yet their best applications are those which make life easier for the *user*--the operator of the computer. The clerk who uses a computer to maintain records is doing so because it makes *his* work easier.

No matter how well programmed, a computer cannot respond as quickly and appropriately to the varied and sometimes inane questions of which the frustrated human mind is capable. Useless ex-

* *© 1962 Little, Brown & Company*

changes and tiresome repetitions are at some point inevitable. The MSO human being is (hopefully) more sensitive to ambiguities and can respond to the need for clarification with minimal cues and half-sentences from the applicant. Ultimately, the information taken and recorded by a computer must still be reviewed by a person. It is obvious that things would progress much more rapidly for both sides *without* the computer.

Many merchant seamen come away from contact with documentation offices feeling that the Coast Guard has given them "a hard time." This is probably inevitable, given the strict requirements of our safety-oriented regulations, and hard feelings undoubtedly arise occasionally on both sides of the desk. But confronting seamen with a machine will only worsen these misperceptions. Face-to-face contact provides the feedback by which the system can change to meet the changing needs of the mariner. Improvements in merchant marine safety can come only when both sides—the regulators and the regulated—work together.

Ron DeMello
Portland, Maine

The computerized documentation system described by LT McKenzie was purely hypothetical. The Coast Guard does not have a computerized documentation system on the drawing board. LT McKenzie wrote his article merely to show what could be done to streamline the application process.--Ed.

"Points" vs. "degrees"

Two of the Letters to the Editor in the January issue touched on the issue of "points" versus "degrees" as the term to be used on Rules of the Road examinations. Captain R. A. Sutherland, Chief of the Merchant Vessel Personnel Division, responded to Richard A. Block, one of the letter writers, as follows:

"I agree that the Rules of the Road examinations should refer to degrees instead of points to coincide with the new Navigation Rules.

"I instructed the Coast Guard Institute to begin an immediate transition from points to degrees as they revise the examination booklets. This transition will have been completed for the upper-level examinations, third mate through master and third assistant engineer through chief engineer, by January 1, 1983. The transition for the lower-level examinations will take approximately one year, as each exam is revised for various reasons." ‡

Please enclose your mailing label when sending in a change of address. Allow eight weeks for change to take effect.

Keynotes

The Coast Guard published the following items of general interest in the Federal Register between January 27, 1983, and March 17, 1983:

Final rule: CGD 82-063(a) and CGD 82-063(b) Revision of Staff Codes and Addresses, February 3, 1983. CGD 13-82-012 Drawbridge Operation Regulations; Youngs Bay, Lewis and Clark River and Skipanon River, Oregon, February 3, 1983. CGD 13-82-011 Drawbridge Operation Regulations; Hoquiam and Wishkah Rivers, Washington, February 3, 1983. CGD 82-112 Editorial Citation Change to Part 25 of Title 33 of the Code of Federal Regulations—Claims Regulations, February 3, 1983. CGD 11-83-01 Establishment of Special Local Regulations for the Del Rey to Puerto Vallarta Race, February 10, 1983. CGD 82-108 Great Lakes Pilotage Rates, February 10, 1983. CGD 83-003 Regulation Update for Inland Navigation Rules, February 10, 1983. CGD 82-018b Ports of Documentation, February 22, 1983. CGD 79-180 Disclosure of Safety Standards by Country of Registry, February 22, 1983. CGD 82-010 Revision of Staff Codes and Addresses, February 28, 1983. CGD 11-83-03 Establishment of Special Local Regulations for the Parker Enduro (California) Race, March 3, 1983. CGD 07-82-10 Amendment to Security Zone, Kennedy Space Center, Florida, March 17,

1983. CGD 11-83-04 Establishment of Special Local Regulations for the National Jet Boat Association Regatta, March 17, 1983. CGD 08-82-013 Anchorage Regulations; Lower Mississippi River, March 17, 1983. CGD 78-156 Marking of Structures, Sunken Vessels and Other Obstructions, March 17, 1983. CGD 01-82-015 Drawbridge Operation Regulations; Back Cove, Maine, March 17, 1983.

Notices of proposed rulemaking (NPRMs): CGD 05-83-01 Safety Zone Regulations: Elizabeth River, Norfolk, Virginia, January 27, 1983. CGD 13-83-03 Drawbridge Operation Regulations; Cowlitz and Lewis Rivers, Washington, January 27, 1983. CGD 03-82-016 Drawbridge Operation Regulations; Oceanport Creek, New Jersey, January 27, 1983. CGD 08-82-019 Anchorage Grounds, Mississippi River below Baton Rouge, Louisiana, including South and Southwest Passes, February 3, 1983. CGD 09-80-02 Special Anchorage Area; Little Traverse Bay, Lake Michigan, Harbor Springs, Michigan, February 3, 1983. CGD 12-83-01 Marine Parade, Pacific Inter-Club Yacht Association Opening Day, San Francisco Bay, California, February 10, 1983. CGD 09-83-01 Drawbridge Operation Regulations; Sheboygan River, Wisconsin, February 10, 1983. CGD 05-83-01 Drawbridge Operation Regulations; Kent Island Narrows, Maryland, February 22, 1983. CGD 08-83-01 Drawbridge Operation Regulations; Bayou Chico, Florida, February 28, 1983. CGD 03-82-024 Drawbridge Operation Regulations; Wappinger Creek, New York, February 28, 1983. CGD 13-83-06 Seattle Opening Day Yacht Parade and Crew Race, March 10, 1983. CGD 01-83-01 Marine Parade; Great Kennebuc River Whatever Race, March 17, 1983.

Notices: CGD 82-068 Notice of OMEGA Radionavigation System Operational Declaration, January 27, 1983. CGD 83-007 Towing Safety Advisory Committee; Request for Applications, February 28, 1983. CGD 83-010 Chemical Transportation Advisory Committee; Request for Applications, March 17, 1983. CGD 09-80-02 Notice of Cancellation of Supplemental Notice of Proposed Rulemaking; Special Anchorage Area, Little Traverse Bay, Lake Michigan, Harbor Springs, Michigan, March 17, 1983.

Questions concerning regulatory dockets or comments on any of the proposals described below should be directed to the Marine Safety Council at the following address:

Commandant (G-CMC)
U.S. Coast Guard
Washington, DC 20593
Tel.: (202) 426-1477

* * *

Stability Requirements for Great Lakes Vessels (CGD 80-159)

In an advance notice of proposed rulemaking published on February 28, 1983, the Coast Guard proposed that damage stability requirements (detailed in the notice) be specified for cargo ships operating on the Great Lakes.

The Coast Guard is taking this action in response to a Maritime Administration study and a recommendation made by the National Transportation Safety Board. In several fatal accidents on the Lakes in the past 25 years, vessels have sunk quickly after structural failure or some other type of failure resulted in flooding and a massive loss of buoyancy.

Comments on this proposal will be accepted by the Marine Safety Council until May 31.

Offshore Supply Vessel Regulations (CGD 82-004)

On February 14, 1983, in an advance notice of proposed rulemaking, the Coast Guard published a preliminary draft of a proposal to prepare regulations for new offshore supply vessels. These regulations would implement legislation addressing inspection standards for such vessels (P.L. 96-378). They would take into consideration the particular characteristics of the vessels, their methods of operation, and the service in which they are engaged.

The Marine Safety Council will accept comments on this proposal until June 14, 1983.

Exposure Suits (CGD 82-075a and 82-075b)

In two separate notices published on February 3, 1983, the Coast Guard proposed that exposure suits be required for

personnel on board mobile offshore drilling units, certain oceangoing and coastwise tank vessels, cargo and miscellaneous vessels, and oceanographic vessels. Vessels and units operating where the water temperature does not threaten life would be exempted from the requirement. The proposal would also permit the carriage of exposure suits in lieu of life preservers on uninspected vessels.

The use of exposure suits in past casualties might have meant a significant reduction in the number of lives lost.

Actions of the Marine Safety Council

At its February and March meetings the Council considered two projects of interest to *Proceedings* readers. These were:

CGD 83-004 Shipboard Navigation Equipment

In November 1981 the Maritime Safety Committee of the International Maritime Organization (then the Inter-Governmental Maritime Consultative Organization) adopted the first set of amendments to the International Convention for the Safety of Life at Sea, 1974. In accordance with the "tacit" amendment procedures of the Convention, these amendments will be deemed to have been accepted unless, prior to March 1, 1984, IMO receives notice of objection from

a) more than one third of Contracting Governments to the Convention, or

b) more than one third of Contracting Governments whose combined merchant fleets constitute not less than 50 percent of the gross tonnage of the world's merchant fleet.

CGD 83-005 Sailing School Vessel Regulations

This proposal would implement the provisions of the Sailing School Act of 1982 by recognizing a distinct new class of vessel, the school ship. At present, school ships are regulated by one of three sets of rules, depending on their size. The physical characteristics of the vessels as well as the nature of sail operations make these rules economically unfeasible for sailing school vessels. In addition, the existing regulations are considered excessively restrictive where school ship operations are concerned.

To set school ships apart from commercial carriers, the Sailing School Act requires the Coast Guard to:

1) Define what a sailing school vessel is and define a passenger with respect to this type of vessel;

2) Require manning that takes into account the participation of sailing school students and instructors in the operation of the vessel; and

3) Prescribe within 18 months inspection regulations for sailing school vessels.

In addition to making the changes required by the Act, the Coast Guard plans to reorganize all the requirements for school ships into a single section of the Code of Federal Regulations. A notice of proposed rulemaking should be ready by August 1983.

The amendments adopted require certain vessels to carry automatic radar plotting aids, speed logs, rate-of-turn indicators, RPM indicators, and pitch and mode indicators (this last item applies to vessels fitted with variable-pitch propellers or lateral-thrust propellers). The requirements will be phased in over a period of time according to vessel size. The Coast Guard will include a more detailed description of the implementation schedule in a notice of proposed rulemaking it plans to publish in September 1983. ‡

MarAd and Coast Guard to Merge Ship-locator Systems

The Maritime Administration and the U.S. Coast Guard have approved a merger of global ship reporting systems which is expected to lead to quicker response to distress calls from ships at sea.

Admiral James S. Gracey, Commandant of the Coast Guard, and Admiral Harold E. Shear, USN (Ret.), Maritime Administrator, announced the signing of a memorandum of agreement that will merge MarAd's U.S. Merchant Vessel Locator Filing System (USMER) into the Coast Guard's Automated Mutual-Assistance Vessel Rescue System (AMVER) this summer. The Coast Guard will administer the combined system.

AMVER, created by the U.S. Coast Guard in 1958, provides search and rescue agencies throughout the world with information for the coordination of search and rescue efforts at sea; when a distress call goes out, the AMVER computer can determine what ships are in the vicinity and might be able to assist. AMVER currently depends on voluntary submission of sailing plans and underway reports.

USMER is a mandatory American system. Established in 1975, the USMER program requires all U.S.-flag merchant vessels and certain foreign-flag, American-owned merchant vessels of 1,000 gross tons and over engaged in foreign commerce and not operating under the control of the Military Sealift Command to report departures and arrivals and their at-sea positions every 48 hours. MarAd uses the data to maintain a current plot of U.S. ships as the basis for marshaling of U.S. ships during emergency situations.

When the systems are merged this summer, USMER reports will be suspended and AMVER reports will become mandatory for those vessels previously required to file under the USMER system.

Merging the two into a single computerized system will speed the flow and processing of information. Ships reporting under USMER have had only 12 radio stations at their disposal. The merger will make available the worldwide network of 120 radio stations which forward AMVER information free of charge.

The new agreement between the Coast Guard and the Maritime Administration does not affect foreign-flag participation in the AMVER program. Foreign-flag vessels' participation will remain voluntary, and data on those ships will be available to users for search-and-rescue purposes only.

MARPOL Film Now Available

A film entitled *Man, Seas, Ships and Pollution* has been prepared by the International Maritime Organization as an information and educational aid for the promotion of marine environment protection.

The film is particularly designed to assist the implementation of Annex I of the International Convention for the Prevention of Marine Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78).

The film is available in English, French, and Spanish in both film and videotape form. The 16mm color film costs US$ 425 per copy (US$ 400 when ten or more copies are ordered at the same time). The videocassette costs £225.

Orders and inquiries should be directed to:

Linfo Produktion AB
Hasselgatan 2
S-44400 Stenungsund
Sweden

(Reprinted from IMO News, *Number 4, 1982)*

MarAd Conducts Joint R&D Projects

As part of its research and development program, the Maritime Administration has entered into three cooperative projects:

- The Offshore Marine Service Association (OMSA) of New Orleans, Louisiana, will conduct a cost-effectiveness analysis of noise control aboard small vessels. Techniques to reduce noise exposure on small vessels such as tugboats, offshore supply boats, crewboats, and inland towboats will be examined. Engineering design, administrative controls, and personal protection devices will be studied and their costs

and benefits analyzed. The cost of the 20-month project will be shared equally by MarAd and OMSA.

- Marine Transport Lines (MTL) of New York, New York, will develop a maritime strategic planning system. The project will provide the methodology and design specifications for a computer-based model to assist in analyzing emerging trade opportunities. The cost of this 27-month undertaking will be shared equally by MarAd and MTL.

- Sea-Land Industries, Inc., Elizabeth, New Jersey, will develop an intermodal routing and tracking system intended to enable ocean carriers to select the most cost-effective and service-effective routes. The system will also provide positive inland tracking of individual trailers and containers. The cost of this two-year project will be shared equally by MarAd and Sea-Land.

SUNY Maritime College Formally Opens Ship-model Basin

The State University of New York Maritime College, Fort Schuyler, Bronx, New York, recently dedicated its newly-constructed ship-model basin.

The ship-model basin was designed and constructed by the staff of the SUNY Maritime College Engineering Department. The tank will allow students and faculty to become involved in hydrodynamic experimentation related to ships and offshore drilling rigs. Professor Jose Femenia, Chairman of the Department, noted that the possibilities offered by the basin will add another dimension to the College's Naval Architecture and Ocean Engineering curricula.

Pan-American Naval Engineers to Hold 1983 Meeting in Washington

The Eighth Congress of the Pan-American Institute of Naval Engineering (IPEN) will be held in the Washington, DC, area at the Hyatt Regency Hotel in Crystal City, Arlington, Virginia, September 11 - 17, 1983. This will be the first time the pan-American professional maritime group has held its congress in the United States.

Several hundred representatives from government, educational institutions, and private industry are expected from maritime nations throughout the Americas. Attendance by observers from a number of the world's other maritime nations is also anticipated.

The Washington congress is aimed at promoting learning and resource exchange in the areas of shipbuilding and repair, ocean and inland-water transportation, naval science and research, standardization, information processing, offshore construction, fishery management, and maritime education. Sessions will include the presentation of professional papers, technical discussions, exhibits, and displays. Visits to the U.S. Naval Ship Research and Development Center and the U.S. Naval Academy have been arranged. A variety of social activities are planned for visitors to the U.S. capital. The U.S. Navy's Ship Systems Command and the U.S. Society of Naval Architects and Marine Engineers will serve as hosts for the international gathering.

The registration fee for IPEN members is US$ 200; for non-members, it is $350. The fee includes costs for planned technical and social events. Admittance to technical sessions only is $95 for non-government persons and $45 for government employees. Additional information about registration and hotel reservations may be obtained by writing to the IPEN Registration Center, P.O. Box 17413, Dulles International Airport, Washington, DC 20041 or calling (703) 471-6180.

IPEN is a non-profit organization dedicated to the promotion of technical advancement of naval architecture, marine engineering, and water transportation. Members of the society are engineers, architects, technicians, and management personnel, both government and private-industry, engaged in maritime activities. Headquarters of the organization is in Rio de Janeiro. ‡

Fire Protection Seminar Cancelled

The one-day Marine Fire Protection Seminar (announced in the last issue) planned for May 18 in Washington, DC, has been cancelled. The Coast Guard will try to reschedule the seminar.

by Marc E. Gage

This is the first in a series of five Chemicals of the Month written by guest authors--chemistry students at the Coast Guard Academy in New London, Connecticut.

Methyl Acrylate: $CH_2=CHCOOCH_3$

Synonyms:	acrylic acid methyl ester, methyl 2-propenoate
Physical Properties	
boiling point:	80°C (176°F)
freezing point:	-76°C (-105°F)
vapor pressure at 20°C (68°F):	65 mm Hg
28°C (82°F):	100 mm Hg
Threshold Limit Value (TLV)	
time weighted average:	10 ppm; 35mg/m^3
Flammability Limits in Air	
lower flammability limit:	2.8% by vol.
upper flammability limit:	25% by vol.
Combustion Properties	
flash point (o.c.):	-3°C (27°F)
flash point (c.c.):	-8°C (18°F)
autoignition temperature:	468°C (875°F)
Densities	
liquid (water = 1.0):	0.96
vapor (air = 1.0):	3.0
Identifiers	
U.N. Number:	1919
CHRIS Code:	MAM
Cargo Compatibility Group:	14 (Acrylates)

If you pull out your I.D. card, you might find this month's chemical encasing it. Methyl acrylate is one of the substances used in laminating, i.e., putting clear, strengthening coatings over paper and textiles. This extremely durable substance is also used in making clear, very strong plastic sheets and in manufacturing resins for leather finishing.

Actually, the methyl acrylate just described is the chemical in its "polymerized" state. In its "monomer," or single-molecule, state, methyl acrylate exists as a clear, colorless liquid which gives off a vapor with a sweet, sharp, fragrant odor. In its polymerized form, it is a solid made up of many monomers which have been bonded together to form chains. Methyl acrylate produces the hardest resin (plastic) of all the chemicals which are part of the acrylic ester series.

Methyl acrylate is shipped in its liquid state. It may be transported by various means: railroad tank cars, tanker trucks, or tankships.

Methyl acrylate has the ability to polymerize (form chains) with itself. While this property is an asset if the reaction can be controlled and the resulting product used in manufacturing, the possibility of uncontrolled polymerization during shipping must be seen as a liability. Self-polymerization may be caused by heat (temperatures greater than 100°F), contaminants, moisture (which can produce rust--a contaminant), or even simply aging. This reaction can be prevented by the addition of an inhibitor. The inhibitors usually used for methyl acrylate are hydroquinone or the methyl ether of hydroquinone (you may have seen the labels "HQ" and "MEHQ"). Oxygen must be present if these inhibitors are to work--in other words, methyl acrylate should not be stored in an inert atmosphere. A second limitation to their effectiveness is that they do not inhibit polymerization of methyl acrylate vapors. These vapors may pass through vents and polymerize on the sides of the vents and on flame screens. Flame

Marc E. Gage is a third-class Cadet at the Coast Guard Academy. He wrote this article in connection with a class on hazardous materials transportation taught by LT Thomas J. Haas. *Technical assistance was provided by personnel in the Cargo and Hazards Branch at Coast Guard Headquarters.*

screens and vents should be checked regularly so that any buildup of the polymer can be detected.

The first step in dealing with any accidental discharge of methyl acrylate is to shut off or eliminate all possible ignition sources. The next step is to stop the discharge. Anyone working in the area should be wearing a chemical protective suit and should be using an SCBA (self-contained breathing apparatus). All workers should stay upwind and, if possible, use water spray to knock down the methyl acrylate vapors. Any operators of nearby water intakes should be notified if the liquid gets into the waterway.

For fighting a fire involving methyl acrylate, dry chemical, foam, or carbon dioxide extinguishers should be used. Firefighters must wear the same protective clothing as personnel responding to a discharge. Because of the flammability of the methyl acrylate vapor, a flashback may occur along any vapor trails and the vapor may explode if it is trapped in a confined area. Because heat may cause self-polymerization and cause containers to rupture violently, water should be used to cool undamaged containers.

In its liquid and vapor forms, methyl acrylate is irritating to the skin, eyes, respiratory system, and digestive tract. Any victim of overexposure to methyl acrylate should be removed to fresh air at once and kept warm. Artificial respiration or oxygen should be given to the victim, if necessary. All contaminated clothing should be removed and the affected skin areas rinsed well with large amounts of water. If the eyes are involved, they should be flushed with water for 15 minutes. In any case, a doctor should be sought immediately. If methyl acrylate is ingested (swallowed), the victim should be made to vomit. Vomiting can be induced by having the victim touch the back of his throat with his finger or by giving him syrup of ipecac (follow directions on the package). (An unconscious person, of course, should never be made to vomit). Again, medical attention should be sought immediately.

Methyl acrylate is regulated by the Coast Guard as a Subchapter O commodity for shipment by tank barge and tankship (Parts 151 and 153, respectively, of Title 46 of the Code of Federal Regulations). The U.S. Department of Transportation regulates it as a flammable liquid. Although the U.S. Environmental Protection Agency does not regulate methyl acrylate as a pollutant, the International Maritime Organization classifies it as a Category C Pollutant. IMO also regulates it as a Chapter 6 cargo (commodities to which the IMO Chemical Code applies). It is found on page 3088 of the IMDG (International Dangerous Goods) Code and is assigned a Hazard Class of 3.2. Methyl acrylate should be inhibited for shipment.

Treatment for persons who have swallowed poisonous chemicals is one of the subjects frequently covered in Chemical of the Month. Readers using that information should consider the following point, made by LT R. W. McGarry, Commanding Officer of the U.S. Coast Guard Cutter INGHAM:

Dear Editor:

I am writing you to point out an error in the treatment given in the February issue of the *Proceedings* for ingestion of 1,1,2-trichloroethane, the Chemical of the Month. My judgment on this matter is based upon the training and experience I have gained during the last three years as an Emergency Medical Technician (Ambulance) and as a Red Cross Advanced First Aid Instructor.

Specifically, the article recommends using two tablespoons of salt in a glass of warm water as an emetic. The use of salt as an emetic used to be quite popular but has fallen into disfavor because of the danger associated with it. Basically because salt is easily obtained and viewed as harmless, poisoning victims were often given an overdose. Quite a few suffered serious complications and even died—because of the salt they were given and not the poison they ingested.

Currently the safest and most effective emetic is syrup of ipecac. It is readily available at pharmacies, and no prescription is required for its purchase. The usual dosage is 1 tablespoon (15 ml) for a child from 1 to 12 years and 2 tablespoons (30 ml or 1 oz) for anyone over 12 years. The dose should be followed by as much water as the victim will tolerate, and he should be kept active. Ipecac may take up to 20 minutes to act. If, after 20 minutes, the victim hasn't vomited, the dosage may be repeated, but only once. As in the case of any poisoning, a physician or Poison Control Center should be contacted as soon as possible, preferably prior to starting treatment. ‡

"Abandon Ship"

by LCDR William J. Morani, Jr.
Chief, Investigation Department
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Providence, Rhode Island

The VIGILANT capsized shortly after its crew had been safely removed to USCGC BIBB. Only the bow remains visible.

Going to sea is an inherently dangerous undertaking; because the dangers are so well-known, however, standard precautionary measures and operating procedures have been devised for many types of incidents. In many of the accounts appearing in this section of the *Proceedings* lives have been lost which could have been saved if the proper equipment had been used and the proper actions taken by shipboard personnel. In the field of marine safety, a great deal of emphasis is placed on lifesaving equipment. Equipment is only as good as the people who use it, however. More often than not, it is people who make the difference between life and death.

The following account is a positive one—a case where the people involved did things "right." They were forced to abandon their offshore supply vessel under adverse weather conditions. Thanks to the preparations and supervision of the master and the chief engineer, no lives were lost.

The VIGILANT, with a crew of 12, departed Mobile, Alabama, at 8:48 a.m. on June 25, 1981, heading for St. Johns, Newfoundland, for Grand Banks oil service support. It was scheduled to spend six months in Newfoundland towing icebergs away from existing oil rig locations. During the voyage north, weather conditions slowly deteriorated:

- June 28: winds were from the northeast at 17 - 21 knots; seas were 7 - 10 feet with a moderate northeast swell.
- Midmorning, June 29: winds were from the north-northeast at 20 - 25 knots; seas were 8 - 14 feet. Since the VIGILANT was taking spray over the bow, its speed was reduced.
- Evening, June 29: the wind increased to 25 - 30 knots (northeast), the seas to 10 - 15 feet. The VIGILANT was now rolling and pitching in a heavy northeast swell, so the master slowed the vessel to 7 knots.
- Early morning, June 30: the wind was steady at 30 knots, gusting to 40; visibility had dropped to 3 - 5 miles because of rain squalls. Seas were confused at 15 - 18 feet (generally northeast) and occasionally ran to a height of 25 feet. The

Crewmen from the motor surfboat "BIBB 1" prepare to pick up survivors from one of the VIGILANT's inflatable life rafts. Photos this page by Chief Warrant Officer Frank Bliss, USCGC BIBB

VIGILANT was now taking seas over the port bow.

It was at this point that the engineer on watch discovered that the engine room and the passageway forward of the engine room were flooding rapidly.

As the water continued to rise above the deck plates, the master and chief mate realized that it was only a matter of time until the ship sank. The master returned to the pilothouse and started to transmit a mayday on 2182 KHz HF and 16 VHF. He received no response. Although the storm's electrical activity made radio contact extremely difficult, the master did manage to get through to an unknown commercial radio station. Since he never received an acknowledgment of his distress call, however, he didn't know whether rescue forces were en route.

Because he had not been able to get through to the Coast Guard, the master believed that if he had to abandon the VIGILANT it would be three to four days before he and his men would be rescued. Therefore, he made preparations accordingly.

He wanted to make sure that the crew was familiar with the launching of the inflatable life rafts, that all crew members were properly clothed, and that extra provisions had been placed aboard the life rafts. The master had the chief mate assemble the crew and instruct them in the proper launching of the 20-man inflatable life rafts, of which there were two. In addition, crew members put on cold-climate suits and life preservers. Those crewmen who could not swim put on inflatable survival suits.

The jacob's ladder was placed over the leeward (starboard) side, and the raft on the port side was moved over to starboard to be used as a backup in case the first raft failed. The ship's flares were gathered and placed in an extra plastic bag. Blankets and extra water, as well as candy bars, were placed near the rafts. At this time, the VIGILANT was slowly gaining a port list.

At 10:00 a.m. the No. 2 life raft was drop-launched. It was secured alongside, and the crew started boarding. The cook boarded first; he was the oldest, and the master wanted to get him off early so as not to hold up the rest of the crew if conditions worsened and rapid abandonment became necessary.

The VIGILANT's list to port was becoming more pronounced. All crewmen except the master, the chief mate, and the chief engineer boarded the raft. These three stayed behind to assist the damage-control party from the U.S. Coast Guard Cutter BIBB, which was now on scene. Once the crew was in the raft, the master released the painter to prevent the raft from being damaged (the seas were causing the raft to ram against the VIGILANT).

At 1:41 p.m. the VIGILANT took a "freak wave" which covered the cargo deck up to the tow winch. The VIGILANT listed to port another 10° and, rolling 25 - 35°, started to settle by the stern. At this time the master made preparations to launch the No. 1 inflatable life raft. Because of the port list, the raft had to be lifted vertically over the bulwark.

The No. 1 life raft was drop-launched and secured alongside. The chief mate and chief engineer boarded first. As the master walked down the VIGILANT, which was now at a 35° angle, the vessel took a "bad roll." The master managed to board the life raft safely, however. After all three men were aboard, a wave collapsed the raft canopy, causing half the raft to be flooded with water. The canopy subsequently sprang back into shape. The painter was released, and the raft drifted away. At 2:16 p.m., with all crewmen safely off, the VIGILANT capsized. According to the master, the crew remained calm throughout the ordeal. The crew was subsequently taken aboard the BIBB.

There were no injuries or loss of life as a result of this casualty. The master deserves praise for displaying leadership and inspiring confidence. The crew members, for their part, obviously responded in a professional manner. This proves that with proper training, discipline, planning, and supervision, the abandonment of a vessel the size of the VIGILANT under adverse conditions can be successful.

More lessons . . .

In the July 1982 issue of the *Proceedings* we related an incident in which a tankship underway in the Gulf of Mexico struck an offshore oil production platform under construction. A storm had apparently rendered the structure's obstruction - to - navigation lights inoperable. Included in the article was the statement that the unlit structure ". . . should have posed no problem . . . for a tanker with two radars and a lookout." A reader pointed out that we were incorrect in our presumption that an unlit ob-

stacle in navigable waters did not pose a hazard to shipping. We agree. This statement was incorrect and should not have appeared; we apologize for the error. Indeed, in this particular incident, the investigating officer determined that the structure, being unlit, contributed to the casualty.

The reader went on to say that mention should have been made of the National Transportation Safety Board findings and recommendations. In its investigation, the NTSB determined that the probable cause of the accident was 1) the failure of the system providing information about the location of hazards to navigation (i.e., Local Notice to Mariners) to provide timely notice of the location of the offshore structure and 2) the failure of the master to acquaint himself with the latest marine information before navigating the vessel near offshore structures on the outer continental shelf. Contributing to the accident was the failure of the marine construction company to maintain aids to navigation on the offshore structure. A synopsis of the NTSB recommendations which ensued and the Coast Guard's response to each shows that we, too, learn lessons from casualties.

At the time of the casualty, the Coast Guard's practice was to publish information about construction of an offshore platform in its Local Notice to Mariners not when first notified about the construction but upon notification that obstruction-to-navigation lights had been installed. The NTSB recommended that the Coast Guard revise its procedures and publish information about construction of offshore structures as early as possible. The Coast Guard concurred with this recommendation and has implemented procedures for publishing information about offshore structures upon notification of their construction.

The investigation revealed that there was a question as to whether the vessel was on the mailing list for the Local Notice to Mariners. The NTSB recommended that the Coast Guard amend section 97.05 of Title 46 of the Code of Federal Regulations to require masters of vessels to obtain the Local Notice to Mariners from the appropriate Coast Guard District Office. The Coast Guard did not concur with this recommendation. The Coast Guard believes that the intent of this recommendation is already covered by 33 CFR 164.33, which requires each vessel to have the Local Notice to Mariners on board for areas to be transited. This requirement is applicable to all self-propelled vessels of 1,600 gross tons or more operating in U.S. waters. Section 97.05 of 46 CFR is applicable only to U.S. vessels. The NTSB agreed with the Coast Guard's interpretation of the existing requirement and reclassified its recommendation as "closed, reconsidered."

The NTSB also determined that the particular shape of the partially completed structure did not present a good radar picture. The NTSB recommended that the Coast Guard amend 33 CFR 67 to include a requirement that radar reflectors be included in the aids-to-navigation requirements for offshore structures during periods of construction. The Coast Guard concurred with this recommendation. Requirements similar to those recommended are being incorporated in an ongoing regulatory project. ⚓

Nautical Queries

The following items are examples of questions included in the Third Mate through Master examinations and the Third Assistant Engineer through Chief Engineer examinations:

DECK

1. Bilge water is collected in seepage basins after running through holes in the floors of tank sections. Which of the following is the correct name for these holes?

A. Manholes
B. Lightening holes
C. Limber holes
D. Drain holes

REFERENCE: Baker, Introduction to Steel Shipbuilding

2. When entering a space with a flame safety lamp, you note a pale blue halo above the orange part of the flame. This indicates that

A. the atmosphere is explosive.
B. the atmosphere is safe.
C. there is a lack of sufficient oxygen.
D. there is a flammable gas in the atmosphere.

REFERENCE: MTAB Marine Firefighting Manual

3. Which of the following chemicals is classified as a Grade D combustible liquid?

A. Carbolic oil
B. Styrene monomer
C. Heptane
D. Cottonseed oil

REFERENCE: Chemical Data Guide, CIM 16616.6 (old CG-388)

4. Nylon line is suitable for

A. towing.
B. boat falls.
C. mooring lines.
D. all of the above.

REFERENCE: Knights Modern Seamanship

5. That point around which a vessel trims is called a

A. turning center.
B. center of buoyancy.
C. center of flotation.
D. center of gravity.

REFERENCE: Ladage, Stability and Trim

ENGINEER

1. What is the most effective fixed fire extinguishing system for cargo holds?

A. Sprinkler system
B. Chemical foam system
C. Dry chemical system
D. CO_2 system

REFERENCE: MarAd Firefighting Manual

2. According to Pollution Prevention Regulations (33 CFR 156.160), no person may connect, top off, disconnect, or engage in any other critical oil transfer operation unless

A. the designated person in charge is present.
B. he holds a tankerman endorsement.
C. he holds a license as master, mate, or engineer.
D. he holds a valid port security card.

REFERENCE: 33 CFR 156

3. The most practical method of extinguishing a Class A fire of burning dunnage is to use

A. chemical foam.
B. hand-portable CO_2 extinguishers.
C. Purple K powder and light water.
D. water.

REFERENCE: MarAd Firefighting Manual

4. What operation must be personally supervised by the person in charge of taking on fuel?

A. The posting of the Declaration of Inspection in a conspicuous place under glass
B. The topping off of any tanks being loaded
C. The disposal overboard of all waste oil or slops from drip pans
D. The periodic sampling during the loading to ensure uniformity

REFERENCE: 33 CFR 156

5. The main objection to the use of dry chemical on an electrical fire is that

A. extinguishing action is not as good as it would be with soda acid.
B. the powder conducts electricity back to the firefighter.
C. dry chemical leaves a powder residue which may render electrical equipment inoperative.
D. the extinguisher will need to be recharged.

REFERENCE: MarAd Firefighting Manual

ANSWERS

1.D;2.A;3.D;4.B;5.C
ENGINEER
1.C;2.D;3.B;4.D;5.C
DECK

If you have any questions about the Nautical Queries, please contact Commanding Officer, U.S. Coast Guard Institute (mvp), P.O. Substation 18, Oklahoma City, Oklahoma 73169; tel.: (405) 686-4417.

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