Proceedings
of the Marine Safety Council

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Coast Guard

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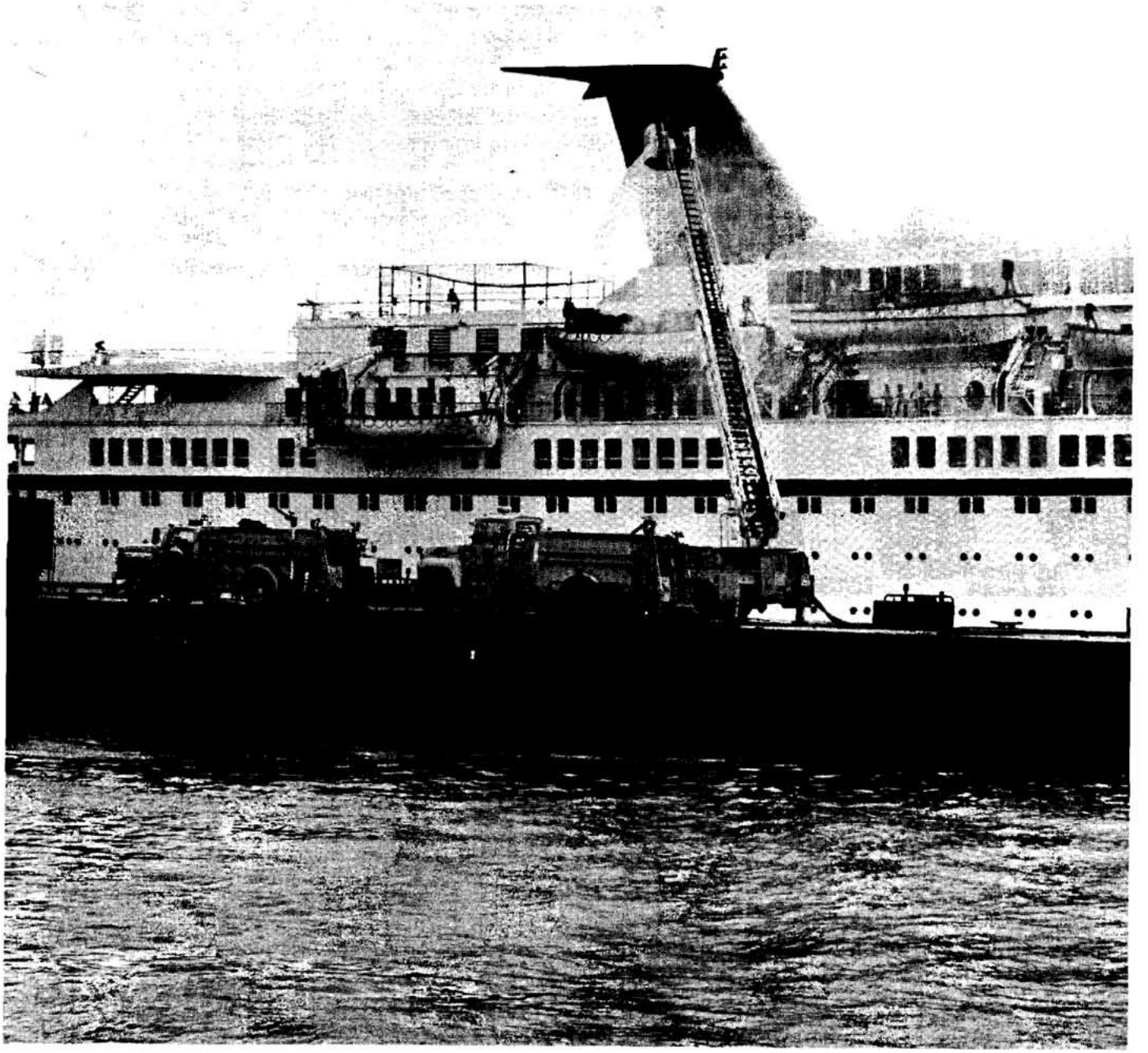

Proceedings
of the Marine Safety Council

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When you have finished reading this issue, please pass it on.

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Emergencies such as the explosion of a bomb on board a ship in port often require coordinated action by a number of rescue agencies. The firefighters shown here (whose trucks are on a barge alongside the ship) are just one of the groups involved in the Puerto Rican Maritime Emergency Response Plan. For more on this plan, which was developed by the Coast Guard, State Civil Defense, and local agencies, see the article beginning on page 43.

Maritime Sidelights

Coast Guard Initiates Direct Commission Program

The Coast Guard has a continuing need for personnel familiar with the merchant marine industry. Although two existing programs, Maritime Academy Graduate and Licensed Officer of the Merchant Marine, fill part of its needs, the new program, Experienced Licensed Officers of the Merchant Marine, is directed at persons who exceed the age limit for the existing programs.

Applicants who are appointed will serve as inspectors, investigators, and as licensing program personnel in Coast Guard field offices. They will be required to serve a minimum of five years on active duty.

Applicants must be U.S. citizens between the ages of 38 and 57. They must be able to meet the physical requirements for a direct commission in the Coast Guard Reserve and those established for retention standards for Coast Guard personnel. They must also be holders of a license authorizing service on inspected vessels and meet one of the following license and service requirements:

1) Master Oceans, any gross tons—no service
2) Master (other)—6 months as Master
3) Chief Mate Oceans, any gross tons—6 months as Chief Mate
4) Chief Mate (other)—12 months as Chief Mate
5) Pilot, over 1600 gross tons—24 months as a Pilot
6) Chief Engineer, over 4000 HP—no service
7) First-Assistant Engineer, over 4000 HP—6 months as First-Assistant.

Waivers of the eligibility requirements will be considered for candidates who have had marine inspector or surveyor experience in the maritime industry.

In this program, as in all recruiting programs, the Coast Guard goal is to achieve a recruiting rate of 18 percent minority personnel.

Further details and application forms can be obtained by contacting U.S. Coast Guard (G-PMR-1), Washington, DC 20593; (202) 426-1370.

Conference Program Announced for National Maritime Show

The National Maritime Show is scheduled to be held in the new Baltimore Convention Center in Baltimore, Maryland, from March 9 - 11, 1982.

In addition to the more than 200 companies that will be represented at the technical exhibits, a program of conference sessions will be held in conjunction with the show. These conference sessions are being sponsored by Lloyds of London Press and Marine Engineering/Log.

Lloyds of London Press will be sponsoring four sessions on management and financial affairs: 1) Shipping Economics, 2) Market Forces, 3) Marine Insurance, and 4) Maritime Law.

Marine Engineering/Log will be sponsoring four sessions on technical and engineering matters: 1) Marine Propulsion Systems: Engine Options for the Future, 2) Coping with High-cost/low-quality Marine Fuels, 3) Training and Manning for the Electronic Age in Shipping, and 4) Electronics on the Bridge.

Further details on the exhibition or conferences can be obtained by contacting:

Peter K. Johnson
National Maritime Show
10703A Stancliff St.
Houston, TX 77099
Tel.: (713) 879-8929

Seabee Calendar—1982

The Seabee Memorial Scholarship Association recently announced the availability of its 1982 calendar. The theme of the calendar is "Pride, Professionalism, and Patriotism," illustrated with color photographs and original artwork. Copies can be ordered for $3.00 plus $.75 for postage and handling from: Seabee Memorial Scholarship Association, Inc., P.O. Box 37229, Washington, DC 20013.

Great Lakes Transportation Publication Available

An inventory of American commercial shipping vessels used in ocean trade and on inland waterways is compiled and published annually in a three-part series by the

Waterborne Commerce Statistics Center of the U.S. Army Corps of Engineers' Water Resources Support Center.

The center announced recently that the 28-page 1980 edition of Transportation Series 3, "Transportation Lines on the Great Lakes System," is available and may be purchased for $1.00 from the New Orleans Engineer District LMNED-S, P.O. Box 60267, New Orleans, LA 70160. Other parts of the series will become available in the near future.

(Reprinted from the November 1, 1981, issue of Maritime Reporter and Engineering News)

LSU Prepares Guide to Lower Mississippi

The Louisiana State University Center for Wetland Resources recently published the 1981 Marine Atlas & Service Guide to the Lower Mississippi River: Baton Rouge to the Gulf of Mexico. This volume is a compilation of information on:

- Operations: barge fleeting, midstream cargo transfer, and ferries,
- Facilities: achorages, docks, terminals, mooring locations, warehouses, and off-river installations,
- Services: launches, midstream suppliers, shipyards and repair, and tugboats,
- Structures: bridges, locks, revetments, and utility crossings,
- Agencies: levee boards and miscellaneous telephone numbers, and
- Maps: color maps showing locations of anchorages, barge fleeting, bridges, ferries, docks, terminals, mooring locations, warehouses, and revetments.

Copies are available for $25 each. Payment (checks should be payable to Marine Atlas) must be enclosed with order. Orders should be sent to:

Marine Atlas & Service Guide
Center for Wetland Resources
Louisiana State University
Baton Rouge, LA 70803

For further information, call Lee Patterson, (504) 388-1558.

News from MarAd

The Maritime Administration has entered into an agreement with the Marine Exchange of the San Francisco Bay Region to develop and demonstrate a computerized system which would track and, in an emergency, could provide the location of all ships in or scheduled to arrive or depart U.S. ports. The management information system would support a nationwide vessel in-port locator system known as VIPLOC. By storing data on vessels, it would aid MarAd in deciding how to utilize ship resources at the start of a national emergency. The project is expected to be completed by June 30, 1982.

The President has announced a program to reduce new Federal loan guarantee commitments for Fiscal Year 1982 by $20.3 billion, including $225 million in the Title XI program administered by MarAd. The ceiling for the current fiscal year on merchant ship financing guarantees had been $900 million. The President's proposed action would reduce the MarAd ceiling to $675 million, with cuts to be achieved primarily by eliminating new loan guarantees and commitments for liquefied natural gas (LNG) carriers and oil drilling rigs.

MarAd recently announced publication of an update of its semi-annual "Vessel Inventory Report." This report, which contains information on all U.S.-registered oceangoing merchant ships of 1,000 gross tons and over as of June 30, 1981, lists merchant ships alphabetically by name and owner or operator. It also includes information on National Defense Reserve Fleet sites and vessels. Copies of the report are available from the Maritime Administration Public Affairs Office, U.S. Department of Transportation, Washington, DC 20590.

Also available from that office is the recently released report "Estimated Vessel Operating Expenses." This booklet contains estimated expenses as of July 1980 for 41 vessels of various types selected to represent a cross-section of the U.S.-flag merchant fleet. The report is divided into four sections: 1) modern vessels of the breakbulk, containership, barge carrying, tanker, and dry-bulk carrier designs, 2) oceangoing vessels constructed during World War II of the breakbulk, tanker, bulk carrier, and lift-on/lift-off vehicle carrier design, 3) coastwise tugs, offshore tug/supply vessels, and inland towboats, and 4) Great Lakes bulk carriers. These data are intended for broad-based estimating only and should not be used for rate-making purposes.

The following items of general interest were published between November 19, 1981, and December 14, 1981:

Final rule: CGD 80-091 Drawbridge Operation Regulations; Milwaukee, Menomonee, and Kinnickinnic Rivers and South Menomonee and Burnham Canals, Wisconsin, December 10, 1981.

Notices of proposed rulemaking (NPRMs): CGD 5-81-09R Drawbridge Operation Regulations; Anacostia River, Washington, District of Columbia, December 7, 1981. CGD 81-071 Drawbridge Operation Regulations; Little Potato Slough, California, December 10, 1981.

Notices: CGD 81-091 Notice of Intent to Prepare an Environmental Impact Statement for Proposed South Bronx-Oak Point Link Project, Harlem River, Bronx County, New York, December 3, 1981. CGD 81-007 Notice of public hearing on Inland Navigation Rules; Annex IV—Distress Signals, December 7, 1981. CGD 81-093 Notice of Study Results for Port Access Route Study, Thirteenth Coast Guard District, December 7, 1981. CGD 81-094 Notice of Study Results for Port Access Route Study, Coast of Alaska, December 14, 1981. CGD 81-095 Environmental Impact Statement for Proposed Bridge Construction Across Garrison Channel at Harbor Island, Tampa, Hillsborough County, Florida, December 14, 1981.

Questions concerning regulatory dockets should be directed to the Marine Safety Council (G-CMC), U.S. Coast Guard, Washington, DC 20593; (202) 426-1477.

* * *

Is it a Bridge or a Boat?

You are navigating a river when you hear three short blasts of a whistle. Being thoroughly familiar with the Rules of the Road, you recognize immediately that it is a vessel using reverse propulsion, backing down. But wait--you also remember that there is a drawbridge in the vicinity, a drawbridge with an opening signal of three short blasts. Which is the correct interpretation of this whistle signal?

To eliminate confusion between drawbridge opening signals and signals with other meanings, the Coast Guard has adopted regulations which prescribe the opening signal to be used by vessels when they approach a drawbridge. The ship approaching the bridge shall sound a signal of one long blast followed by one short blast. Should the bridgetender be ready and able to open the draw, he will sound a signal of one long and one short blast also. The one long and one short signal does not coincide with any other signals currently in effect. Should the situation arise that the draw cannot be opened or must be closed immediately, the bridgetender will sound four short blasts—the accepted danger signal. Visual signals will also be standardized. A white flag by day and a white light by night will indicate a request for a draw opening and an acknowledgment signal, and a red flag and red light will signal that the draw cannot be opened or must be closed immediately. In areas where there are many drawbridges in close proximity to each other, different signals will apply, depending on the area.

This final rule, titled "Drawbridge Operation Regulations; Opening Signals for Drawbridges" (CGD 75-237), was published on December 3, 1981, and will take effect on February 8, 1982.

Revision Proposed for Regulations on Marking of Obstructions

The Coast Guard is proposing to revise the regulations which govern the marking of structures, offshore thermal energy conversion (OTEC) facilities, sunken vessels, and other obstructions. The proposed revisions are a result of changes in the law governing Coast Guard authority to mark obstructions and are intended to eliminate redundancy and make the regulations easier to understand.

An NPRM was published on November 19, 1981 (CGD 78-156), detailing the changes in the law which extend the jurisdiction of the Coast Guard beyond the present 12-mile territorial waters limit to include the waters over the continental shelf. Under the proposed rules, obstructions in that area (with certain exceptions, such as bridges or dredges) will have to be marked by the owner with a buoy or daymark and a light. Obstructions not properly marked by the owner will be marked by the Coast Guard at

the owner's expense. Any obstruction requiring marking must be reported to the Coast Guard, and the type of marking must be approved.

For further information contact LT Walter L. Johnson, Short Range Aids to Navigation Division (G-NSR), U.S. Coast Guard, Washington, DC 20593; (202) 426-1974.

Coast Guard Requests Comments on Impact of Regulations

The Coast Guard is reviewing regulations that have a significant impact on small entities, such as small businesses, small organizations, and small governmental jurisdictions. An entity with fewer than 500 full-time employees or a governmental jurisdiction with fewer than 50,000 people can generally be considered "small." Gross sales (the levels to be determined according to the industry) can also be a qualifying factor.

The Coast Guard is going through the sections of the Code of Federal Regulations (CFR) containing Coast Guard regulations to determine which regulations have the most significant impact and should be reviewed first. The assistance of the public is requested for this screening process. Comments, especially those from small entities, are invited from persons who have experienced the impact of regulations firsthand.

In a notice published December 7, 1981 titled "Regulatory Flexibility Act Review of Coast Guard Rules and Regulations" (CGD 81-089), the Coast Guard requested that each person or organization commenting on this notice 1) cite the CFR Title and Part number for the regulations discussed, 2) describe the effects of the regulation on small entities, 3) identify those effects the commenter feels have a disproportionately heavy impact on small, as opposed to large, entities, and 4) recommend any changes the commenter feels would improve the regulations. The Coast Guard is currently using the CFR Part as a unit of review. Any suggestions for a different unit of review or any additional pertinent comments or data will also be welcomed. Comments should be submitted by April 6, 1982, to: Commandant (G-CMC), U.S. Coast Guard, Washington, DC 20593.

CTAC Seeking Members

The U.S. Coast Guard is seeking applicants for appointment to membership on the Chemical Transportation Advisory Committee (CTAC). This committee advises the Marine Safety Council on measures promoting safety in the transportation of hazardous materials on vessels, the transfer of these materials between the vessels and shore, and the use of waterfront facilities.

The committee usually meets at least once a year and holds subcommittee meetings on specific problems as necessary. Members are not paid by the Government and receive neither travel nor per diem allowances.

Selection will be based on expertise in the subjects covered. To achieve the balance of membership required by the Federal Advisory Committee Act, the Coast Guard is actively soliciting applications from minorities, women, and public interest representatives.

An alternate may be selected for each member appointed to the committee. I a prospective member choose to select an alternate, an application for alternate membership for that person shoul be included with the applica tion for membership.

Application forms can b obtained by writing to: Com mandant (G-CMC), U.S. Coas Guard, Washington, DC 20593 The deadline for receipt of ap plications is February 20 1982.

For further informatio contact Mary Williams, Haz ardous Materials Division (G MHM), U.S. Coast Guard Washington, DC 20593; (202 426-2306.

Actions of the
Marine Safety Council

December Meeting

The Council approved fo publication the followin NPRMs:

CGD 81-023 Equipmen Requirements for Recreation Boats; Personal Flotatio Devices

This NPRM will change Par 175 and 181 of Title 33 of th Code of Federal Regulatio (33 CFR 175 and 181) by re voking an obsolete rule an making editorial changes co cerning personal flotation de vices (PFDs). It will also cla ify the PFD carriage requir ments.

CGD 81-038A Visual Distre Signal Equipment Requir ments

This notice, modifying 33 CF 175, will clarify confusi language concerning the nu

ber and type of visual distress signals that must be carried on recreational boats and the waters on which they are required. A second change is the replacement of a grandfather clause for existing flare launchers with a permanent exemption to be granted in certain cases.

Also approved by the Council were the following work plans:

CGD 81-088 Great Lakes Pilotage Regulations

This project would increase the present U.S. pilotage rates by approximately 10 percent. The increase is the result of a recently concluded agreement with the Canadian Great Lakes Pilotage Authority. An NPRM will be published in sufficient time to permit a final rule to become effective by April 1. As a sidenote, it is understood that the Canadian Great Lakes Pilotage Authority is planning to increase its rates in all Canadian areas (Welland Canal and the Cornwall District) by 14.75 percent.

CGD 81-090 Implementation of SOLAS 74

The International Convention for the Safety of Life at Sea, 1974, signed in London on November 1, 1974, entered into force for the United States on May 25, 1980. This project carries out the mandates of Executive Order 12234 of September 3, 1980 (Enforcement of the Convention for the Safety of Life at Sea), which directs the Coast Guard to promulgate regulations for implementation of the Convention. In addition to editorial changes throughout Title 46 of the CFR, rules will be developed to implement the new requirements for Lifesaving Equipment, Fire Protection Equipment, and Ship Control and Operations. An NPRM is scheduled to be published in April.

CGD 81-092 Miscellaneous Amendments to Electrical and Fuel System Regulations for Recreational Boats

As a result of regulatory reviews carried out under Executive Order 12291, it has been determined that many sections of 33 CFR 183 (Subparts I and J) are no longer necessary or do nothing to significantly improve boating safety. This project proposes to eliminate such sections. The schedule calls for an NPRM to be submitted to the Federal Register in May. ↕

If you are on the mailing list for Navigation and Vessel Inspection Circulars (NVCs) and 1) wish to be dropped, 2) wish to change the number of copies you are receiving, or 3) have a change of address, please notify Commandant (G-MP-4/14), U.S. Coast Guard Headquarters, Washington, DC 20593; (202) 426-2163.

Retro-reflective Material Adds Extra Safety Measure to PFDs

Although federal regulations require only Type I personal flotation devices (PFDs) to have retro-reflective surfaces for better night visibility, it may be something that should be considered for other PFDs as an extra safety feature, according to Norman Lemley, Chief of the Survival Systems Branch of the Coast Guard's Office of Merchant Marine Safety.

Retro-reflective material has been used in recent years to provide better visibility on all kinds of items: children's clothing, truck bumpers, highway signs, bicycle tires, and even Halloween costumes. Its purpose is to reflect a high percentage of the light shone on it, giving the material a glowing effect against a background of darkness. This reflection is a highly desirable feature for a PFD if the wearer might be searched for at night. It can make him as much as ten times more visible to rescuers and greatly increase his chances of being seen, according to tests conducted by 3M Company and the Coast Guard.

A safety-conscious recreational boater may want to consider putting retro-reflective tape on all PFDs aboard if any cruising is done at night. This has two advantages. First, it makes everyone on deck who is wearing a PFD more conspicuous and easier to keep track of. This could save time and maybe a life by hastening the realization that someone is missing. Second, the most obvious advantage is the increased chance of finding the missing person once a man overboard search has begun.

Mr. Lemley warned those considering putting retro-reflective tape on their PFDs to carefully follow manufacturer's instructions for application of the tape and to avoid sewing the tape to the PFD. The hazard in sewing anything to a PFD is the chance of puncturing the sealed flotation packages in the PFD, thereby rendering it useless. ↕

Port Access Route Study Update

by Christopher Young
Navigation Rules and Information Branch
Short Range Aids to Navigation Division

The Coast Guard has begun publishing the results of the Port Access Route Study in the Federal Register. As described in an earlier article (see the August 1981 issue of the Proceedings), the Coast Guard is obligated under the Ports and Waterways Safety Act to study the need for designated routing measures in the offshore approaches to U.S. ports. As each District office completes the study of its area, a report of the results is being published in the Federal Register. When a report recommends a new routing measure, it will be followed by a notice of proposed rulemaking (NPRM).

The completed study will involve nine reports, of which five have thus far been published. The results for the area of the Florida peninsula were published in the Federal Register on October 1, 1981. The report for the area of New York and Delaware Bay approaches was published on October 5, 1981. The report for the Gulf of Mexico was published on October 8, 1981. The study of the area which includes the coast of Washington and Oregon was reported on December 7, 1981, and the report for Alaska was published on December 14, 1981.

The results for the remaining study areas will be published within the next few months.

Two of the five published reports have made recommendations for routing measures and rulemaking, of which the following are highlights:

As indicated in the Keynotes section of the January 1982 issue of the Proceedings, the **Eighth District** report for the Gulf of Mexico makes several recommendations:

1) new fairway anchorages at Sabine Bank and Calcasieu Pass/Lake Charles;

2) an expanded fairway at Southwest Pass;

3) a new fairway at the entrance channel to Lower Mud Lake; and

4) new precautionary areas and a traffic separation scheme (TSS) for the approach for Galveston Bay.

The **Seventeenth District** report for the coast of Alaska makes two recommendations:

1) a new fairway arrangement in the approach to Prince William Sound; and

2) a new fairway through Unimak Pass.

Regulations will be required to implement the proposed shipping safety fairways and anchorages. Establishment of the TSS will also require application to the Inter-Governmental Maritime Consultative Organization (IMCO) for adoption and international recognition.

Details of the above recommendations can be found in the appropriate issues of the Federal Register. They are also available from Coast Guard Headquarters at the address listed below.

Although results for the remaining study areas will not be final until published, preliminary reports indicate that minor modifications and an extension of existing traffic separation schemes will be proposed for the California coast.

Further information on the Port Access Route Study can be obtained by contacting the author of this article at U.S. Coast Guard Headquarters (G-NSR-3), 2100 Second St. SW, Washington, DC 20593; (202) 426-4958. ⚓

AWSC Develops Shipyard Safety Training Program

The shipbuilding and ship repair industry ranks eighth nationwide in the incidence of lost workday injuries. Most of these injuries involve new employees. Finding that existing training programs were not geared to shipyard work and that many safety supervisors in smaller shipyards had little or no training expertise, the American Waterways Shipyard Conference recently launched "Operation CATFISH": Careful Attention to Factors Involving Safety and Health. The shrewd catfish, besides lending his name to the acronym, serves as a model for employees, since he survives by using his wits to overcome the hazards in his environment.

Operation CATFISH, otherwise known as the New Employee Shipyard Safety Training program, aims to prevent accidents by focusing employees' attention on safety and health hazards. After completing the program, employees should be able to:

- Recognize principal shipyard hazards.
- Demonstrate basic safety requirements to protect themselves from these hazards.
- Explain why certain safety requirements

The AWSC found that existing safety programs were not geared to shipyard workers, who face special health and safety hazards.

are necessary.
- Describe and meet their safety responsibilities.

The AWSC has developed a step-by-step guide for shipyard management. The "Training Administration Manual" is designed to enable even those with no teaching experience to administer the program easily. The guide begins with a summary of the benefits to be gained by instituting a safety and health program and suggestions for how management can demonstrate its commitment and support to safety and health in general. Among the latter are:

- Drafting a safety and health policy statement
- Appointing a safety and health representative who will be responsible for disseminating safety and health information within the facility
- Conducting regular facility inspections to uncover and correct safety and health hazards (employees should participate in these)
- Holding scheduled safety meetings
- Giving new employees proper training in safe work practices
- Providing a safety and health handbook or list of facility safety and health rules
- Investigating employee injuries, illnesses, and near-miss accidents to determine why they occurred, how to prevent a similar occurrence in the future, and what corrective action should be taken
- Maintaining records of injuries and illnesses

The chapter "Before Training" contains everything from guidelines for determining the needs of a specific shipyard's employees to pointers on scheduling the sessions and setting up the facilities. "During Training" goes on to discuss how the material can best be presented. The AWSC has prepared a "canned" slide/cassette presentation, but substitute slides of a shipyard's own workers and worksites can be inserted and the course thus tailored to any particular shipyard. Suggestions are also offered for supplementing the course, emphasizing certain areas, stimulating discussion, and using quizzes given before and after training to evaluate the effectiveness of the program (a sample quiz is included). "After Training" concludes this section with tips for following up on suggested improvements in the course and checking employees' retention of material by conducting worksite walk-throughs.

The slide/cassette show begins by explaining to new employees why they will benefit from a safety training program: by becoming aware of safety and health hazards, they can help prevent accidents and reduce their chances of job-related injuries or illnesses. The training program concentrates on seven basic areas:

- Personal protective equipment
- Good housekeeping
- Proper use of tools and equipment
- Safe practices for materials handling
- Proper procedures for entering confined spaces
- Electrical safety
- Taking responsibility for being a safe worker

The American Waterways Shipyard Conference (AWSC) was organized as part of the American Waterways Operators, Inc. (AWO), in 1976 to address the problems of our nation's small and medium-sized shipyards. The more than 300 such shipyards located on the East, West, and Gulf Coasts and the Great Lakes and Western rivers are responsible for building and repairing the tugboats, towboats, and barges for the country's domestic water transportation industry, the supply boats, crewboats, and other specialized vessels for the offshore service industry, and the vessels used in the fishing industry.

Six committees have been established within the organization to act on matters ranging from improving labor relations to working toward industry self-regulation. "Operation CATFISH" was developed by the Shipyard Safety Committee under a "New Directions" grant from the Occupational Safety and Health Administration.

The AWSC is now implementing "CATFISH" and producing additional shipyard safety training programs. AWSC's goal is to become a center of competency for safety and health programs in the shipyard industry.

Each of these areas is discussed first in broad terms, then in greater detail.

In the section **"Personal Protective Equipment,"** the importance of wearing hard hats, face shields, safety glasses, gloves, and, for some workers, special suits and helmets, respirators, safety belts, lifelines, and life jackets is emphasized.

"Housekeeping" includes pointers on keeping work areas clean and orderly, removing combustibles from around hot work, and keeping scaffolds clear, as well as a warning about placing heavy objects on hoses or cables and a reminder to keep stairs and walkways clear.

"Tools and Equipment" cautions workers to keep guards in place, use grounded plugs and cords, and inspect tools for defects.

"Materials Handling" includes guidelines for lifting, instructions for using hand signals and the proper rigging, and a warning to stay away from suspended loads.

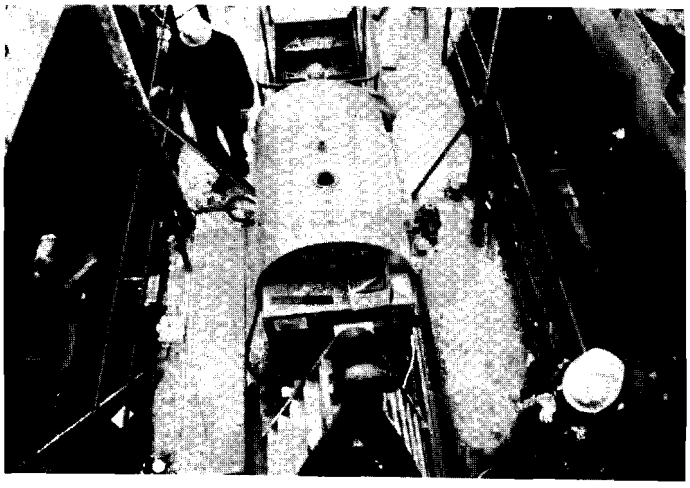
Among the safe work practices discussed in **"Confined Spaces"** are testing for oxygen and combustible gas, inspecting hoses and torches, making sure electrical equipment is insulated, grounded, and bonded, shutting off oxygen and fuel gas hoses during breaks and removing them from the confined space, and removing hoses and torches at the end of each shift.

"Electrical Safety" stresses the importance of keeping cables and plug boxes away from wet areas, reporting damaged cables, plug boxes, or lights, and inspecting tools and cables for damage.

Finally, **"Employee Responsibilities"** impresses on the workers the fact that each of them is responsible for seeing that the shipyard is a safe place to work and that all of the other employees are counting on them to do their part.

The slide/cassette show concludes with reminders of the importance of recognizing, reporting, and remedying hazards, reading directions, and reporting and attending to injuries.

Some excerpts from the section on housekeeping will serve to illustrate how the AWSC presents its points:



"Keep your work area clean and orderly.

"Clutter on the worksite is an invitation to slip or trip and fall. Arrange your equipment and materials so they are convenient to use but out of the way of others. Be especially careful with hoses and cables, and clean up any mess or spill as you go along. You will find that these work practices make your job easier and more comfortable, as well as safer.

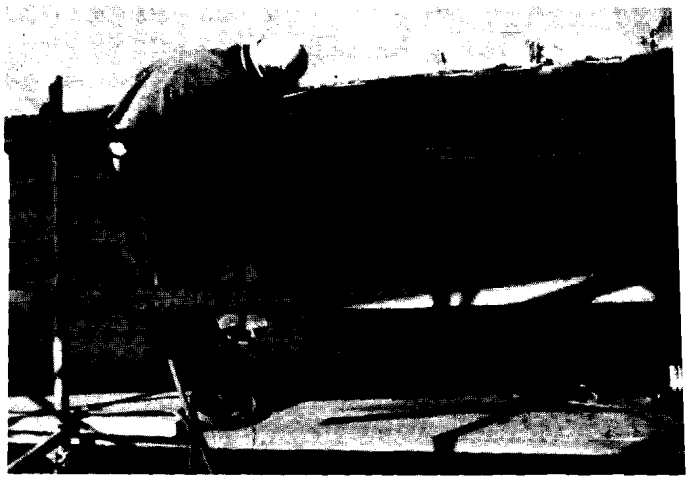
"Remove combustible materials around hot work, such as welding and cutting.

"Open flames, torches, and sparks from electrical equipment or grinding are well-known fire hazards. The presence of combustible materials magnifies the possibility of fires and explosion. So keep all chemicals, fuel, paints, and other petroleum-based products as far as possible from sources of heat or sparks.

"Keep scaffolds clear, especially when workers are below.

"If you are the fellow on the scaffold, the last thing you need is to trip over a hammer or a bucket of paint left on a scaffold plank. If you are the guy below the scaffold, you can certainly do without being struck by a falling hammer or splashed by an upset bucket of paint.

"Keep in mind that scaffold or deck clutter may hurt both you and your friends.



"Do not place heavy objects on hoses or cables.

"Shipbuilding and repair involves many lines, hoses, and cables for oxygen and fuel gas, electricity, and compressed air. You can rightly imagine that damage to the electrical cables could have serious consequences. Heavy objects can damage the cables and cause arcing, sparking, and even electrical shock.

"Keep stairs and walkways free of lines, hoses, and cables.

"You already know the reason for having clear passages during the normal course of a workshift: to prevent falls, of course. You probably know the other reason, too. It's to help you escape quickly in case of fire or other emergency."

The slide/cassette presentation consists of over 70 slides similar to these. The entire program, consisting of a loose-leaf tabbed binder containing the slides, the synchronized audio cassette, a script of the tape marked with slide cues, and the "Training Administration Manual," can be ordered for $110.00, plus $3.00 for postage and handling, from:

American Waterways Shipyard Conference
1600 Wilson Boulevard
Arlington, Virginia 22209
Tel.: (703) 841-9300

Data Sought on Electricity-related Accidents

The Electronic and Electrical Equipment Section of the National Safety Council is currently undertaking a project to establish a data base on electricity-related industrial accidents. The data collected will be used 1) as a guide for developing training aids, 2) to evaluate present training materials, 3) to serve as a reference for Council representatives serving on various code panels and standards committees, and 4) to help member companies in their accident prevention efforts. All reports will be kept confidential and anonymous. Only the collective data of all reports will be used. The Council asks your cooperation in using the form below to report electricity-related accidents on the job that resulted in personal injury.

Instructions: This form is to be used to report data on industrial accidents where contact with live electrical conductors caused injury or was the underlying cause of an accident. Electric shock that initiated a chain of events which led to injury should be included. If more than one employee sustains injury from a particular accident, please complete a separate form for each employee.

Data on Injured Employee

1. Age _____
2. Sex _____
3. Occupation _____
4. Trained in _____yes
   handling electricity _____ no
5. Date of injury _____
6. Time of Day _____
7. Time worked on day
   of injury _____hrs.
8. Length of experience in
   handling electricity ____yrs.

Data on Injury:

1. Injury resulted from
   ____Direct contact
   ____No direct contact
2. Severity:
   ____First Aid
   ____Medical treatment
   ____Days restricted activity
   ____Lost work days
   ____Permanent disability
   ____Fatality.
3. Describe injury & part of body involved.
   _____
   _____
   _____

Description of Incident

_____

_____

_____

Equipment Involved

1. Building Electrical Service Equipment
   _____Service Enclosure
   _____Panel boards, Switchboards
   _____Transformer, Rectifiers, Capacitors, etc.
   _____Fixed Wiring
   _____Other (Specify) _____
   _____
2. Permanently Wired Devices
   _____Lighting
   _____Equipment
   _____Other (Specify) _____
   _____
3. Stationary Plug-In Devices
   _____Lighting
   _____Equipment
   _____Other (Specify) _____
   _____
4. Portable Electric Devices
   _____Tool
   _____Cord
   _____Test Equipment
   _____Portable Power Source
   _____Lighting
   _____Outlet Box
   _____Appliance
   _____Other (Specify) _____
5. Temporary Wiring
   _____Lights
   _____Receptacles
   _____Other (Specify) _____
6. Electrical Equipment
   _____Test Equipment
   _____Control Equipment
   _____Radio Frequency
   _____Other (Specify) _____

Wiring Components Involved

_____Receptacle
_____Plug
_____Connector
_____Lamp holder
_____Fuses
_____Circuit breaker
_____Switch
_____Other (Specify) _____
_____

Power Source Involved

_____Less than 50 volts
_____Nominal 120 volts
_____Nominal 240 volts
_____Max of 480 volts
_____Max of 1 kv.
_____Max of 16 kv.
_____Other (Specify) _____

_____d.c.
_____single phase a.c.
_____3 phase a.c.

Contributing Circumstances

_____Failure to follow instructions and/or safety rules.
_____Deliberately working "hot."
_____Unknowingly working "hot."
_____Crowded workspace or difficult access.
_____More than one power source.
_____Inadequate "lock-out" - power on.
_____Defect in tools or instruments used.
_____Improper or degraded termination.
_____Insufficient or degraded insulation.
_____Overloaded circuit.
_____Ground fault, lack of or poor equipment ground.
_____Phase-to-phase short circuit.
_____Fault or short circuit caused by foreign object.
_____Misapplication of components or wiring.
_____Improper wire size.
_____Lack of personal protective equipment.
_____Lack of protective tools.
_____Drill-in or dig-in to live conductor.
_____Other (Specify) _____

Corrective Measures Taken/Remedial Action

_____
_____
_____
_____

Additional Comments

_____
_____
_____
_____

Send Completed Forms To:

Joseph H. VanSickle
Section Administrator
National Safety Council
444 N. Michigan Avenue
Chicago, Illinois 60611

To the Rescue:

Six Agencies Join Forces to Respond to Emergencies

by LCDR Richard W. Harbert
Chief, Port Safety Branch
Seventh Coast Guard District

It's Saturday, June 27, 1981--another warm, tropical day in San Juan, Puerto Rico. The British passenger vessel CUNARD COUNTESS sits gleaming in the sunshine alongside its berth in Old San Juan. Tourists and sightseers stroll along the pier, some stopping to admire the beautiful, large white vessel.

The peaceful scene described above is suddenly shattered at 10:45, when a phone call is received at a local police station reporting a bomb aboard the CUNARD COUNTESS. Emergency procedures are immediately set in motion, but the bomb explodes at 11:20, before the ship can be evacuated. Smoke begins to pour out of the vessel. Victims can be seen lying in the after section of the ship and struggling in the water alongside the vessel. As the crowd begins to swell, fire trucks roll in, and firemen begin spraying water into the ship.

These events and more did take place in San Juan this past summer. Happily, though, the victims were volunteers and the smoke resulted from a smoke bomb. The fire trucks, too, were simply part of a large-scale disaster preparedness exercise conducted to test the Puerto Rican Maritime Emergency Response Plan. This plan was developed by the U.S. Coast Guard, State Civil Defense, and several local agencies.

The staged event was somewhat reminiscent of an actual fire which occurred on the Italian

"Victim" on board CUNARD COUNTESS awaits help from rescuers.

passenger vessel ANGELINA LAURO on March 30, 1979, in Charlotte Amalie Harbor in St. Thomas, U.S. Virgin Islands. That fire, which destroyed the ship, produced a great deal of confusion among the many response organizations involved in the firefighting effort. A report by the National Transportation Safety Board called for improved planning for such incidents, better coordination among agencies, and the drawing up of interagency contingency plans. The ANGELINA LAURO fire accelerated efforts by the Coast Guard's Marine Safety Office in San Juan, Puerto Rico, to complete pre-planning with the governments of both Puerto Rico and the Virgin Islands. The resulting Puerto Rican Maritime Emergency Response Plan sets forth what response actions are to be taken by five commonwealth agencies and the Coast Guard and seeks to coordinate the actions of the six groups. The plan also provides for semiannual emergency response exercises designed to: 1) train Emergency Response Team personnel in the use of the Response Plan, agency contingency plans, and emergency response equipment, 2) identify improvements for the contingency plans, and 3) provide a means for updating the information on which the contingency plans are based.

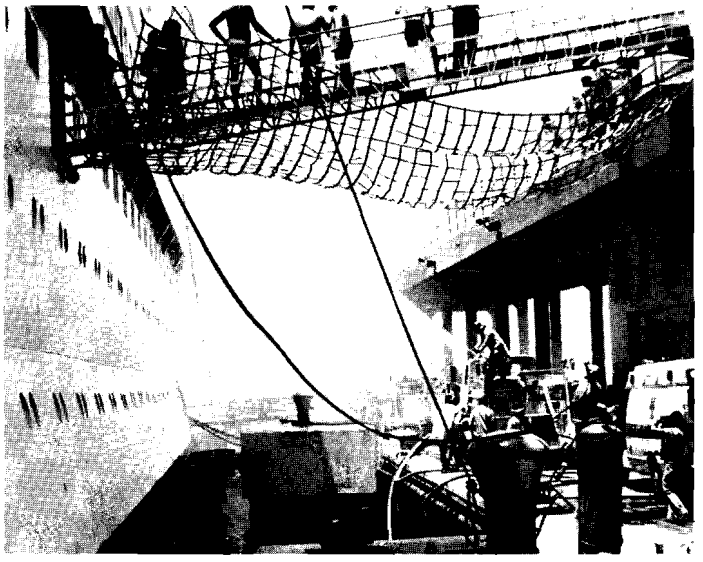
The simulated explosion and fire aboard the CUNARD COUNTESS set the stage for the first such exercise. It was announced to the participating agencies and aimed to test both the plan itself and the agencies' ability to respond.

Cunard Cruise Lines graciously volunteered the use of its 950-berth vessel, which arrived early on the morning of the drill. Since the CUNARD COUNTESS' cruises begin and end in San Juan, the drill could be conducted between voyages.

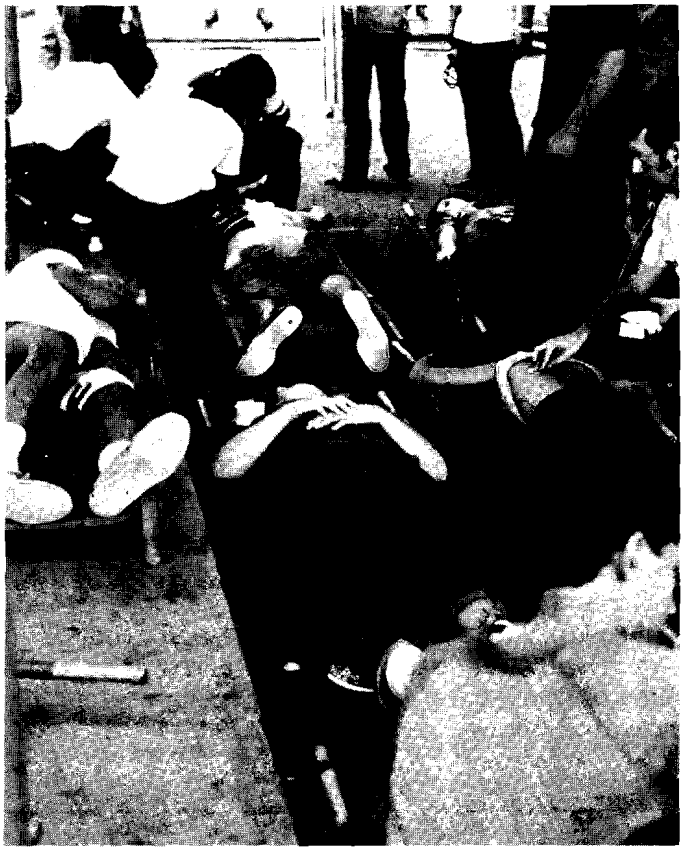
The drill, which took three hours to complete, ultimately involved nearly 1,500 people. Response activities included the following:

- the firefighting efforts of firemen from three fire trucks which parked along the pier apron and three aboard a barge which was brought alongside the CUNARD COUNTESS,
- firefighting assistance from the Coast Guard Cutter POINT WARDE and a port authority vessel,
- recovery of the "victims" from the water by Coast Guard vessels,

Captain of the Port San Juan (CDR James Parent) weighs concerns prior to making decision.



Dockside firefighters join the effort to put out flames on the CUNARD COUNTESS.



Above, emergency medical aid is provided for "victim" aboard CUNARD COUNTESS. Right, medical personnel provide emergency medical aid to "victims" brought to dock. Below, "victims" await transport to area hospitals.

- triage (screening for priority treatment) and medical emergency evacuation by Civil Defense of 100 "victims" with extremely realistic moulage (molded) wounds,
- emergency medical treatment by Health Department volunteers following evacuation of "victims" across the gangway,
- transport of the "victims" in numerous ambulances to 22 area hospitals where emergency room treatment was administered,
- crowd and traffic control by the police,
- establishment of a safety zone around the vessel and pollution control by the Coast Guard's Marine Safety Office, and
- overall coordination and provision of a mobile command post by Civil Defense.

Following the exercise, the performance of the responding agencies was extensively critiqued. Each of the agencies was able to assess both its own capabilities and those of the other agencies. Problems that remained to be resolved also came to light. One of the many positive results of the exercise was the good working relationship demonstrated by the Coast Guard, the marine industry, and the local/commonwealth government. The exercise in Puerto Rico, and others like it, should significantly improve response to maritime emergencies, if and when they occur. ⚓

1982 International Ice Patrol Service

In February or March 1982, depending on iceberg conditions, the International Ice Patrol will commence its annual service of guarding the southeastern, southern, and southwestern limits of the regions of icebergs in the vicinity of the Grand Banks of Newfoundland. Reports of ice in this area will originate from passing ships and from flights by Ice Patrol aircraft. Twice each day, the Ice Patrol will broadcast a bulletin and a daily radiofacsimile chart containing ice information to inform ships of the extent of this dangerous region. Broadcasts of the Ice Patrol Bulletin will be made as indicated below:

BROADCAST STATION	TIME OF BROADCASTS (GMT)	FREQUENCIES (kHz)
SITOR ICE BROADCAST		
Coast Guard Communication Station Boston/NIK	0018 1218	5320, 8502 8502, 12750
CW BROADCASTS		
Coast Guard Communication Station Boston/NIK (Best to follow SITOR best)	0030 (APPROX) 1230 (APPROX)	5320, 8502 8502, 12750
Canadian Forces Station Mill Cove/CFH	0130, 1330	438 (Off-air 1200-1600 second Thurs each month) 4255 (2200-1000) 6430 Continuous 8697 Continuous 12726 (1000-2200) 16926.5 On request 22397.5 On request
LCMP Broadcast Norfolk, VA (Coast Guard Communication Station Portsmouth/NMN)	0030-0115 0630-0715 1000-1100 1230-1300 1900-1945 2300-2359	8090 Continuous 12135 Continuous 16180 Continuous 20225 (1200-2359)

BROADCAST STATION	TIME OF BROADCASTS (GMT)	FREQUENCIES (kHz)
Thurso, Scotland	same times	7504.5 Continuous 12691 (0800-1900) 3724 (1900-0800)
Keflavik, Iceland	same times	5167 (1900-0800)
RADIOFACSIMILE BROADCASTS		
Coast Guard Communication Station Boston/NIK	1600	8502, 12750 (+400 Hz)
Canadian Forces Station Mill Cove/CFH (Primarily sea ice in Gulf of St. Lawrence and North. Limits of icebergs sometimes given)	0000, 1300, 2200	133.15 Continuous (Off air 1200-1600 second Thursday each month) 4271 (2200-1000) 6330 Continuous 9890 Continuous 13510 (1000-2200)
Radio Station Bracknell, United Kingdom/GFE (Eastern North Atlantic Sea Ice Observations)	1413	2618.5 (1800-0600 Oct 1-Mar 31 1900-0500 Apr 1-Sep 30) 4782 Continuous 9203 Continuous 14436 Continuous 18261 (0600-1800 Oct 1-Mar 31; 0500-1900 Apr 1-Sep 30)
SPECIAL BROADCASTS		
Canadian CG Radio Station St. John's/VON	As required when icebergs are sighted outside the limits of ice between regularly scheduled broadcasts and as necessary prior to the commencement and after the close of the official Ice Patrol season	478 Preceded by International Safety Signal (TTT) on 500 kHz
USCG vessel when on International Ice Patrol duty	When in the vicinity of ice in periods of darkness or fog	2670 Preceded by International Safety Signal (SECURITE) on 2182 kHz

REPORTS OF ICE, SEA SURFACE TEMPERATURES, AND WEATHER

All ships may assist in the operation of the International Ice Patrol by reporting all sightings of ice (instructions below). When reporting ice, please include the following information:

POSITION
SIZE AND SHAPE OF ICEBERG
CONCENTRATION OF ICE (FOR SEA ICE, IN TENTHS)
THICKNESS OF ICE (FOR SEA ICE, SPECIFY IN FEET OR METERS)

When reporting icebergs to the Ice Patrol, please use the following categories:

DESCRIPTIVE NAME	HEIGHT (feet)	(meters)	LENGTH (feet)	(meters)
Growler	(G) less than 4	less than 1	less than 20	less than 6
Small Iceberg	(S) 4 - 50	1 - 15	20 - 200	6 - 60
Medium Iceberg	(M) 51 - 150	16 - 45	201 - 400	61 - 122
Large Iceberg	(L) more than 150	more than 45	more than 400	more than 122

TYPE

SHAPE	DESCRIPTION
Blocky	(B) Steep sides with flat top. Very solid. Length-height ratio less than 5:1.
Tilted Blocky	(V) Blocky iceberg which has tilted to present a triangular shape from the side.
Drydock	(K) Eroded such that a large U-shaped slot is formed with twin columns. Slot extends into or near waterline.
Pinnacled	(P) Large central spire or pyramid.
Dome	(D) Large, round, smooth top. Solid-type iceberg.
Tabular	(T) Flat-topped iceberg with length-height ratio greater than 5:1.

In addition to ice reports, the Ice Patrol needs sea surface temperature and weather reports to predict the drift and deterioration of ice and plan aerial patrols. Please make these reports to the Ice Patrol every 6 hours when within latitudes 40 N to 50 N and longitudes 42 W to 60 W. Ships with one radio operator may prepare the reports every 6 hours and hold them for transmission when the radio operator is on watch. When reporting, please include the following:

SHIP POSITION, COURSE, SPEED, VISIBILITY, AIR AND SEA SURFACE TEMPERATURE, WIND DIRECTION, AND SPEED.

It is not necessary to make the above weather report if the ship is making routine weather reports to METEO WASHINGTON.

HOW TO REPORT CONDITIONS

Report ice sightings, weather, and sea surface temperature to Commander, International Ice Patrol--COMINTICEPAT NEW YORK NY—through U.S. Coast Guard Communication Stations or, if unable to work these stations, Canadian Coast Guard Radio Station St. John's/VON. Make these reports in accordance with the following chart. Note that direct printing radio teletype (SITOR) is available through USCG Communication Stations Boston (NMF/NIK) and Portsmouth (NMM).

CALL	LOCATION	BANDS GUARDED DAY	NIGHT	FREQUENCY
NMF NIK	USCG Communication Station, Boston, MA	500 kHz	500 kHz	427/472 kHz
		CALLING FREQUENCIES (Channel 4-5-6)		
		8 MHz	8 MHz	8459.0 kHz
		12 MHz	12 MHz	12783.0 kHz
		DIRECT PRINTING RADIO-TELETYPE SELCALL 1.01095 (Assigned frequency shown)		
		*4176.0 kHz	*4176.0 kHz	4355.5 kHz
		*6292.0 kHz	*6292.0 kHz	6500.0 kHz
		8349.5 kHz	8349.5 kHz	8710.5 kHz
		*12497.0 kHz	12497.0 kHz	13077.0 kHz
		16666.0 kHz	*16666.0 kHz	17203.0 kHz
		*22198.0 kHz	*22198.0 kHz	22567.0 kHz
		SSB VOICE FREQUENCIES (Carrier frequency shown)		
		6200.0 kHz	6200.0 kHz	6506.4 kHz
NMN	USCG Communication Station, Portsmouth, VA	500 kHz	500 kHz	466 kHz
		CALLING FREQUENCIES (Channel 4-5-6)		
		8 MHz	8 MHz	8465.0 kHz
		12 MHz	12 MHz	12718.0 kHz
		16 MHz		16976.0 kHz
		DIRECT PRINTING RADIO-TELETYPE SELCALL 1.01097 (Assigned frequency shown)		
		*4172.0 kHz	*4172.0 kHz	4351.5 kHz
		*6258.0 kHz	*6258.0 kHz	6496.0 kHz
			8357.0 kHz	8718.0 kHz
		2504.5 kHz	12504.5 kHz	13084.5 kHz
		16673.5 kHz		17210.5 kHz
		*22205.5 kHz	*22205.5 kHz	22574.5 kHz
		SSB VOICE FREQUENCIES (Carrier frequency shown)		
		1200-0200 GMT	0200-1200 GMT	
			4143. 3 kHz	4428.7 kHz
		6200.0 kHz	6200.0 kHz	6506.4 kHz
		8241.5 kHz	8241.5 kHz	8765.4 kHz
		12342.4 kHz		13113.2 kHz
VON	Canadian Coast Guard Radio Station, St. John's, NFLD	500 kHz	500 kHz	478 kHz

*Available upon request

Vessels equipped with MARISAT may send messages at their own expense to COAST GUARD NYK (TELEX NO. 126831).

The Ice Patrol Office in New York can be reached by telephone throughout the season. The numbers are:

(212) 668-7882 (Ice Patrol Duty Officer) or
(212) 668-7055 (Coast Guard Operations Center).

GULF OF ST. LAWRENCE INFORMATION

From (approximately) December to late June, the Canadian Ministry of Transport provides sea ice information services for the Gulf of St. Lawrence as well as the area of the Strait of Belle Isle from longitude 58-00 W to 66-30 W. Ships may obtain ice information by contacting Ice Operations Officer, Dartmouth, Nova Scotia, via any east coast Canadian Coast Guard radio station. Details of the services are available from the Ice Operations Office, Marine Services Information Center, Ministry of Transport, P.O. Box 1013, Dartmouth, Nova Scotia. Telephone: (902) 426-5664 or 5665. TELEX: 019-22625.

SUPPLEMENTARY ICE INFORMATION

Supplementary information on ice conditions and navigational warnings for the Strait of Belle Isle, the coast of Newfoundland, and the Grand Banks can be obtained by contacting the Canadian Coast Guard radio stations St. Anthony/VCM, Comfort Cove/VOO, St. Lawrence/VCP, or St. John's/VON.

WARNINGS

1. In spite of the best efforts of the Ice Patrol, icebergs have drifted and may drift unnoticed into the usual shipping routes in the area of the Grand Banks. The positions of icebergs in the Ice Bulletin are computed at 12-hour intervals. However, after about 5 days without an iceberg's having been resighted, the positions estimated by driftings are unreliable. The Ice Bulletin indicates the dates of iceberg sightings.

2. In general, icebergs approaching and to the south of latitude 48 N appear in the Ice Bulletin. In the event there are large numbers of icebergs south of 48 N, the Ice Bulletin will carry the positions of only those icebergs near the limits of ice and isolated icebergs.

3. Careful tests by the Ice Patrol have proved that radar cannot provide positive assurance of iceberg detection. Since sea water is a better reflector of radar signals than ice, an iceberg or growler inside the area of sea return on the radar scope may not be detected. The average range of radar detection of a dangerous growler or very small iceberg, if such bergs can be detected by radar at all, is only 4 miles. While radar remains a valuable aid for ice detection, its use cannot replace the traditional caution exercised by mariners in the vicinity of the Grand Banks while transiting south of the estimated limits of all known ice.

COMMENTS

The Ice Patrol earnestly solicits comments, particularly concerning the effectiveness of the times and frequencies of radio transmissions. Please mail facsimile charts received at sea to Commander, International Ice Patrol, Governors Island, New York, NY 10004. Please indicate the frequency used and position of the ship when it received the broadcast. ‡

A Review of Fishing Vessel Safety-- Past and Present

by Richard C. Hiscock

As the world's population and hence the need for protein increases, so will the effort to harvest food from the sea. There is every indication that the U.S. fishing fleet is growing steadily and will continue to grow as new demands and new markets are developed.

Unfortunately, there will also be, if current trends continue, an increasing number of deaths resulting from fishing vessel casualties. If this trend is to be reversed, some very positive steps must be taken to improve vessel design and construction, manning, and requirements for firefighting and lifesaving equipment. Whether these steps will be taken by government in conjunction with industry or by industry alone remains the subject of debate.

It is the opinion of this author that little significant improvement in fishing vessel safety will be seen until the Coast Guard is given broad authorization by Congress to regulate safety requirements for all commercial fishing vessels.

What follows is a brief review of marine safety approaches, legislative efforts, existing fishing vessel regulations, and recent fishing vessel casualty statistics.

Three distinct approaches can be taken to improve marine safety:

- Designing and building safer vessels
- Training and licensing operators—making them responsible for safer operation
- Requiring modern firefighting and lifesaving equipment to improve the chances of survival and rescue in the event the men or vessels fail.

All three of these approaches have been taken over the years to improve safety aboard U.S. cargo and passenger vessels: vessels are designed and built to standards and inspected regularly, operators and crews are licensed, and firefighting and lifesaving equipment is prescribed and inspected. These efforts have resulted in an excellent safety record for these vessels.

Recreational boat safety received a boost when Congress passed the Federal Boat Safety Act of 1971. This law granted the Coast Guard authority to develop regulations for construction as well as lifesaving and related equipment. Under this law, manufacturers are required to comply with construction standards. Operators are required to supply and maintain approved lifesaving and firefighting equipment. The Act also authorized funding to states for boating safety programs.

There have been several legislative attempts to improve safety on fishing vessels, but none has been successful.

In 1935-36 (during the post-MORRO CASTLE reorganization of marine inspection laws) various proposals were made to regulate motor vessels (15 gross tons or over) in the same manner as steam vessels. Steam vessels—including steam-propelled fishing vessels [which are no longer being built]—were already subject to inspection and manning requirements. Despite the eloquent testimony of some that the lives of fishermen working on motor vessels were just as important as those working on steam vessels—method of propulsion should not determine safety requirements—fishing vessel and towboat interests were successful in defeating these proposals. Thus Congress sanctioned the dubious concept of "uninspected commercial vessel."

In 1938 an attempt was made to remedy this situation. Several bills were introduced to correct the generally recognized deficiencies of the Motorboat Act of 1910. The original proposal by the Bureau of Marine Inspection and Navigation included provision for the certification of operators and the inspection of vessels 15 gross tons or over. Again, fishing and towboat interests exerted considerable pressure, and the Bureau was forced to recommend that the inspection and certification provisions be withdrawn. No motorboat bill was enacted that year.

Two years later the much less comprehensive Motorboat Act of 1940 (MBA-40) was passed, repealing the Motorboat Act of 1910. This legislation was originally adopted to address recreational motorboat safety only. The MBA-40 differs from most acts in that it limits regulatory authority to those few items specifically set forth in the Act. In other words, no regulations can be promulgated requiring commercial uninspected vessels to have any of the new safety features resulting from the technological developments of the last 40+ years unless the MBA-40 is amended. Although the legislation was directed at recreational motorboats, it governs commercial uninspected vessels as well. Since no regulatory program dealing specifically with fishing vessel safety has ever been developed, this means that the only safety regulations which apply to fishing vessels are those found in the MBA-40.

Since the MBA-40 was never intended to address commercial vessel safety, it does not adequately address any of the three approaches to marine safety outlined at the beginning of this article. There are no construction standards for fishing vessels. Operators need not be licensed unless the vessel is carrying passengers. Finally, firefighting and lifesaving equipment requirements are woefully insufficient, particularly given recent developments in rescue and survival technology. The regulations applied to commercial fishing vessels are thus inadequate, out-of-date, and restricted by the language of the law.

In 1941 a bill was introduced by Representative Thomas A. Flaherty of Massachusetts specifically addressing fishing vessel safety. It proposed "to place fishing boats [15 gross tons or over, fishing outside Inland Waters] under the supervision of the Bureau of Marine Inspection and Navigation." It outlined specific requirements for watertight bulkheads, bilge pumps, ring buoys, life preservers, lifeboats, radio telephone, first-aid kits, line-throwing guns, annual inspection, and the licensing of operators. A great deal of research in support of the bill was presented by the Atlantic Fishermen's Union of Boston, representing Northeast fishermen. However, most other fishing industry representatives opposed the bill, particularly the provisions for watertight bulkheads and the licensing of operators. Owing largely to the events of December 7th (1941), the bill was never enacted. No fishing vessel safety bill has been considered since, yet fishing vessel casualties are, among commercial vessels, the leading cause of death.

Many commercial fishing vessels fail to meet even the minimum requirements found in MBA-40. Enforcement is hampered by the stipulation that a vessel must be underway to be cited for a violation. Also contributing to this state of affairs is the lack of a uniform national educational program for fishing vessel safety, which might improve the situation.

Casualty data for commercial fishing vessels are at best incomplete. The Coast Guard's enforcement power in regard to casualty reporting is limited, as is its manpower. Many accidents involving uninspected commercial vessels thus go unreported or are not investigated, particularly those involving state-numbered commercial vessels.

If progress is to be made in the area of fishing vessel safety, a first step will be to gather more complete data.

However, a review of the available data—the latest available statistics, for Fiscal Year 1979 (FY-79), can be found in the December 1980 issue of the Proceedings of the Marine Safety Council—reveals significant information

concerning fishing vessel safety.

During FY-79 there were 4,665 casualties reported involving 8,159 commercial vessels. Seventy percent (5,695) of the vessels involved were uninspected. About twenty percent (1,272) of those were fishing vessels.

But fishing vessel casualties resulted in almost 50 percent (92) of the 190 deaths reported on uninspected vessels. Eighty-four percent (77) of these deaths were a result of flooding, foundering, or capsizing. Overall, casualties involving uninspected vessels accounted for about 90 percent (172) of all deaths reported.

"Drowning" is the reported cause of death in 77 percent of all deaths reported. The role of hypothermia in these deaths is not revealed in the data.

In his examination of fishing vessel data for 1978 and 1979 (see the August 1981 issue of the Proceedings), John Crawford of the Coast Guard's Marine Safety Evaluation Branch makes the distressing observation that, despite advances in the technology of both ship design and lifesaving equipment, "the absolute number of deaths and the number of deaths adjusted to the number of fishing vessels appear to be holding steady or even rising slightly. Worse yet, the number of deaths relative to the number of vessels lost seems to be rising."

If there is to be a significant saving of life, property, insurance premiums, and search-and-rescue effort, there must be a national fishing vessel safety program that addresses all three approaches to marine safety outlined at the beginning of this article.

Design and construction standards should be established for various classes of vessels, types of fisheries, and regions. Vessels should be inspected regularly to ensure that maintenance of hull, machinery, and lifesaving/firefighting equipment is carried out.

Operators should be educated and licensed for the various vessel classes, fisheries, and regions to ensure knowledge of the navigation rules and seamanship appropriate for their particular vessel, fishery, and region.

The positive results of such long-term programs would take several years to be realized. There is, therefore, an immediate and urgent need to upgrade lifesaving and firefighting equipment requirements, taking advantage of modern technology to increase the chances of survival and rescue in the event that vessels and men are overwhelmed by the sea.

The author of the preceding article is a consultant on fishing vessel safety and emergency rescue-survival equipment and the author of Safety Notes for Fishermen, a monthly newsletter for commercial fishermen. He prepared the article in connection with his work as a member of the Water Safety Committee of the National Safety Council. As stated, the views expressed are his and do not necessarily reflect the official position of the Coast Guard. The policies he describes are just three approaches to increasing safety on fishing vessels. Other approaches (lawsuits, high insurance premiums for vessels with poor safety records, etc.) certainly exist. Articles or letters from other readers expressing support for their ideas are always welcome.—Ed.

Lessons from Casualties

STABILITY AND FISHING VESSELS

Certain types of fishing vessels have very serious stability problems, and it appears that many fishermen are not aware of the danger. Two classes of vessels stand out:

- the East Coast clam and scallop vessels and
- the Alaska crabbing vessels.

East Coast clam fishermen may have gotten the word about stability a few years ago, when several vessels were lost. The need for a better understanding was certainly there, and as new people come into this industry there may still be a danger. The problem is clearly indicated by the statement made by one fisherman after his vessel sank: he couldn't understand why the vessel sank—it was an easy-riding, comfortable vessel, and it had been in worse weather. What he did not realize was that the cause of the comfortable ride was also the cause of the lack of stability. The vessel rolled gently because it did not have enough stability to roll with more snap. The fact that a vessel has withstood worse weather is not proof of seaworthiness. This vessel actually sank in what appeared to be acceptable weather, except that it was taking

the seas on a stern quarter, which causes rolling. And roll is just what the vessel did—completely over.

Considering the weight of a loaded clam cage, about 6000 pounds, it is not hard to see why stability is a serious matter with these vessels. It is particularly problematic for the clammers with stern rigs: they lift the loaded cages high above the deck, and the steel tube frame of the lifting rig is massive and tall. One of the vessels that sank was raised and examined by a naval architect before being put back into service. Significant modifications had to be made in order for it to be safe. Tanks had to be taken out of service, bulwarks had to be modified, and a large quantity of fixed ballast had to be placed in the bilges. It is unclear how many other fishing vessels in use might be just as dangerous.

In the clam and scallop fishery, there is one phenomenon that is important to remember. When a load is suspended from a boom or crane line, the point of action of the weight is at the end of the boom, regardless of the height of the load. This means that a heavy cage of clams on deck has the effect of being lifted to the end of the boom even if it is lifted only one inch. This can have a very significant effect on stability.

The Alaska crab vessels have similar problems. They operate in some very stormy waters and have to be prepared for the worst. Generally, they are well built and maintained because the results of a mishap in those waters are very serious. Unfortunately, common sense all too often takes a back seat to the impulsive decision: "Hell, I can carry a few more traps." Which of the basic human failings is it—greed, stupidity, ignorance? For greed and stupidity, there is very little that an article like this can do. If ignorance is the problem, well that's another story. Gather 'round and listen--then tell your friends.

It makes a lot of difference how many crab traps are stacked on deck. Securing them tightly to the deck is not enough to make them safe. If they are too heavy and too high they will roll the vessel over—believe it, because it has happened too many times. The first time was once too often. One case comes to mind that shows how far some people will go. The boat was so overloaded that it did not make it past the breakwater--the first wave capsized it.

One of the most recent cases involved a vessel that was examined by a naval architect. It was determined to conform to the stability criteria recommended by the Inter-Governmental Maritime Consultative Organization (IMCO) for fishing vessels, provided the vessel was loaded in accordance with its crab pot loading table. The loading table allowed a maximum of 77 650-pound crab pots to be arranged in two tiers. When the vessel capsized, it was carrying 90 crab pots arranged in three tiers. The extra 8450 pounds stacked in a third layer were too much for the 107-foot vessel of 199 gross tons. Three of the five crewmembers died.

Another recent case involved a 46-foot vessel of 30 gross tons. Fortunately, this accident occurred in June, and two of the four crewmembers managed to survive, even though they had to spend the night on top of the overturned hull. The boat was loaded with 120 dungeness crab pots weighing about 125 pounds each, and 95 of these were stowed on deck. The Coast Guard report on this casualty indicates that the 12,000 pounds on deck (some of the pots were stacked five high) was probably the cause of instability that allowed the boat to be overwhelmed by a large wave.

There are no regulations or laws requiring stability standards for U.S. fishing boats. It is the boat owner's responsibility to make sure that the vessel is constructed properly for its intended use, and it is the boat operator's responsibility to use the boat correctly and pay proper attention to the forces of nature. Unfortunately, it appears that many owners depend on "seaman's eye" or some kind of a guess to determine the safe load-carrying capacity of a vessel, and operators also do this. Operators sometimes fail to heed available forecasts and allow themselves to get into weather that should be avoided. This lack of prudence is taking a toll in lives and vessels. Every owner should have his vessel(s) examined by a naval architect to see that construction and equipment are correct for the intended use and to calculate safe operational limits after performing a static inclining test. THEN OWNERS AND OPERATORS SHOULD USE THE INFORMATION—A LOT DEPENDS ON IT.

The IMCO recommendations for stability criteria are very interesting and offer several approaches to the problem of stability. The two relevant IMCO documents, "Recommendation on Intact Stability of Fishing Vessels" and "Recommendation for an Interim Simplified Stability Criterion for Decked Fishing Vessels Under 30 Meters in Length" have been reprinted by the Coast Guard and are available as Navigation and Vessel Inspection Circular No. 3-76. Requests should be directed to U.S. Coast Guard Headquarters, G-MP-4/14, Washington, DC 20593. ‡

Chemical of the Month

Phosphoric acid: H_3PO_4

synonyms:	orthophosphoric acid		
Physical Properties	**75%***	**80%***	**85%***
boiling point:	132°C (270°F)	142°C (288°F)	155°C (311°F)
freezing point:	-18°C (0.5°F)	5°C (41°F)	21°C (70°F)
vapor pressure (in mmHg)			
at 20°C (68°F):	5.65	none found	2.16
at 110°C (230°F):	340	none found	160
Density	**75% and 80%**		**85%**
liquid (water = 1.0):	1.6		1.7

Threshold Limit Values (TLV)

time weighted average (TWA):	1 mg/m^3
short term exposure limit (STEL):	3 mg/m^3

Identifiers

U.N. Number	1805
CHRIS Code	PAC

*Commonly shipped concentrations

Did you know that when you were drinking a soft drink you were drinking phosphoric acid? Phosphoric acid is an ingredient in many carbonated beverages. As a matter of fact, the "phosphate" drink popular in years gone by was based on phosphoric acid.

The fact that phosphoric acid is also used for such purposes as making plastics fire-retardant is an indication of this chemical's extreme versatility. In 1980 only eight other chemicals were produced in larger quantities than phosphoric acid. The major portion went into the making of fertilizers. Other industrial uses include treating metal surfaces, bonding high-alumina refractory products, manufacturing chemicals, catalyzing chemical reactions, flameproofing cellulose fabrics, and making nylon, ethyl alcohol, and detergents. Phosphoric acid is also used to refine sugar and is an ingredient in jams, jellies, salad dressing, yeast and vegetable oils, in addition to the soft drinks mentioned above. Phosphoric acid is an essential nutritional product. The U.S. Recommended Daily Allowance, the level which will provide a margin of nutritional safety, has been set at 0.1 gram.

A three-step process is often used to produce phosphoric acid: phosphorous is burned to produce an oxide, the oxide reacts with water to form an acid mist, and the acid mist is collected. An older and cheaper method involving a reaction between phosphate rock and sulfuric acid produces crude phosphoric acid. With either method, the acid must be purified to remove such contaminants as fluorine, calcium, iron, aluminum, sulfate, and even arsenic. Many phosphorous-containing rocks also have small amounts of by-product uranium, which can be recovered.

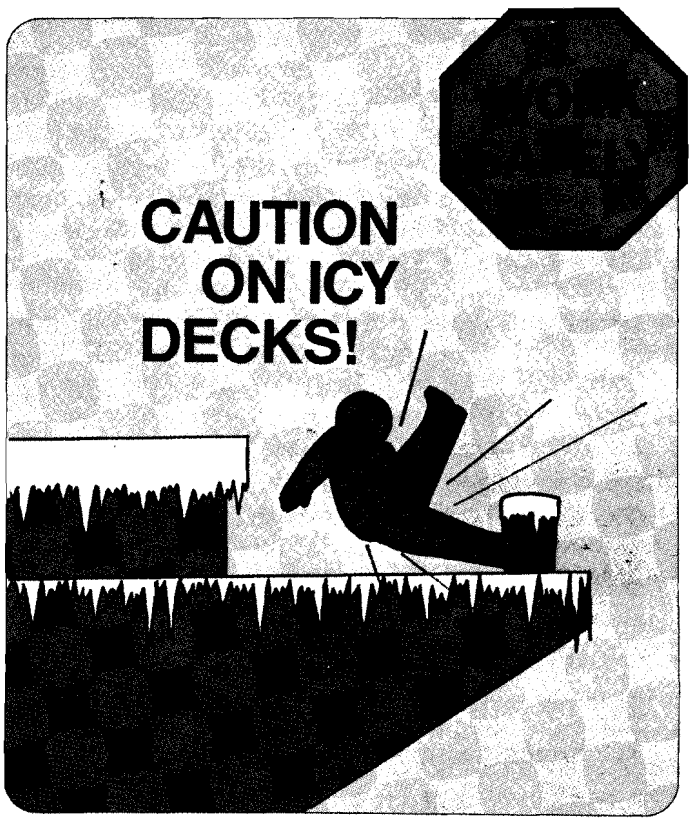
The phosphoric acid used in foods is a very pure "food grade" and is extremely dilute and thus harmless. Concentrated phosphoric acid,

however, like other acids, can be quite harmful. The chemical is shipped at concentrations ranging from 35% to 85%, although the most common concentrations are 75%, 80%, and 85%. A 75% solution can cause skin burns. Since the vapor pressure of phosphoric acid is so low, phosphoric acid vapor presents no appreciable hazard, except possibly in enclosed, unventilated spaces. The Threshold Limit Values (recommended maximum levels for short- and long-term exposure) shown above are for the acid mist (tiny liquid droplets). This mist, which can be generated during handling of the chemical, is an irritant to the eyes, upper respiratory tract, and skin. As is the case with other strong acids, persons handling phosphoric acid should wear goggles, face shields, and respirators; coverings for the head, skin, feet, and hands may also be required. If any acid is spilled on the skin or in the eyes, the affected area should be flushed with large quantities of water; if the acid is swallowed, large quantities of water should be drunk and vomiting induced. In either case, medical attention should be sought immediately.

Fortunately, phosphoric acid does not burn. Concentrated phosphoric acid is highly corrosive, however, and, as such, can react with various metals, generating hydrogen, a highly flammable gas. The tanks in which phosphoric acid is shipped are normally constructed of either rubber-lined steel or a stainless steel that resists corrosion by phosphoric acid; a third possibility is lining the tanks with a material approved for phosphoric acid.

The U.S. Coast Guard regulates phosphoric acid in Parts 151 and 153 of Title 46 of the Code of Federal Regulations, and the Materials Transportation Bureau regulates it as a corrosive material. Both the Inter-Governmental Maritime Consultative Organization (IMCO) and the Environmental Protection Agency classify it as a Category D Pollutant.

Hazard Evaluation Branch
Cargo and Hazardous Materials Division



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. When a vessel is towing another vessel, the towing line should be

A. as long as possible.
B. of such a length that one vessel will be on a crest while the other is in a trough.
C. of such a length that the vessels will be "in step."
D. as short as possible under the circumstances; not over two wave lengths.

REFERENCE: Knights

2. Which is true concerning the speed of fronts?

A. Cold fronts move faster

than warm fronts.
B. Cold fronts move more slowly than warm fronts.
C. Cold fronts and warm fronts move with equal speed.
D. Cold fronts move more slowly at the northern end, thus allowing the warm front to overtake the northern section.

REFERENCE: Meteorology--Donn

3. Magnetism is strongest in soft iron when

A. the long axis of the iron is perpendicular to the lines of force.
B. the long axis of the iron is parallel to the lines of force.
C. the iron is at a 45^{o} angle to the lines of force.
D. none of the above, since the magnetic strength will not vary.

REFERENCE: Bowditch

4. A vessel floating at its light draft displaces 7,400 tons. The center of gravity at this draft is 21.5 feet above the keel. The following weights are loaded on the vessel:

WEIGHT	VCG
450 tons	17.4 feet
220 tons	11.6 feet
65 tons	7.0 feet

The distance above the keel of the new center of gravity is

A. 20.9 feet.
B. 18.7 feet.
C. 17.8 feet.
D. 14.7 feet.

REFERENCE: Stability and Trim—La Dage

5. When lifeboat winches with grooved drums are fitted on a vessel, the lead sheaves to the drums shall be located to provide fleet angles of not more than

A. 4^{o}.
B. 8^{o}.
C. 12^{o}.
D. 16^{o}.

REFERENCE: 46 CFR 33.10, 46 CFR 94.33-10

ENGINEER

1. Feedwater supplied to a flash-type distilling plant will flash to vapor in the first stage because the flash chamber

A. pressure is lower than the saturation pressure corresponding to the feedwater temperature.
B. temperature is higher than the evaporation temperature of the supplied feedwater.
C. heat exchange surfaces are directly in the path of the entering feedwater.
D. orifices finely atomize the heated feedwater entering the flash chamber.

REFERENCE: Harrington

2. At sea level, how many BTUs must be added to one pound of water at 32^{o}F to raise the temperature to 212^{o}F?

A. 16 BTUs
B. 144 BTUs
C. 180 BTUs
D. 970 BTUs

REFERENCE: Principles of Naval Engineering

3. Erosive tube failure in a heat exchanger could be the result of

A. high temperature.
B. waterside fouling.
C. excessive cooling water velocity.
D. poor heat transfer.

REFERENCE: Osbourne

4. Excessive wear on the shaft sleeve running through the stuffing box of a centrifugal pump will

A. cause new packing to be torn and scored.
B. cause severe pump vibration at operating speed.
C. damage the packing gland stuffing box.
D. damage the pump casing interstage seals.

REFERENCE: Centrifugal Pumps

5. The total static head of a system against which a centrifugal pump must operate is the difference in elevation between the

A. discharge liquid level and the suction liquid level.
B. discharge liquid level and the pump centerline.
C. suction liquid level and the pump centerline.
D. suction submergence level and the pump discharge.

REFERENCE: Centrifugal Pumps

ANSWERS

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

INDEX TO COAST GUARD REGULATIONS

Many of the publications previously included in this list (under the title "MERCHANT MARINE SAFETY PUBLICATIONS") were unavailable because they were being revised or reprinted. These publications were reprints of selected subchapters of the Code of Federal Regulations (CFR). The Superintendent of Documents publishes the CFR in yearly updated form, and the CFRs are thus the best source for those needing up-to-date information on Coast Guard regulations. Information on the price and availability of any desired volume can be obtained by calling (202) 783-3238 or writing: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

Safety-related publications not falling into the CFR-reprint category will henceforth be published periodically in a separate list.

Listed below are the Code of Federal Regulations (CFR) subchapters covering Coast Guard shipping regulations (Title 46, Chapter I of the CFR). Chapter I comprises nine volumes. A desired volume should be ordered by referring to the parts it contains; for example, if marine engineering regulations (Subchapter F) are needed, 46 CFR Parts 41 to 69 (the third volume) should be ordered. The numbers shown in the "Coast Guard Equivalent" column refer to previous reprints of selected subchapters. See the chart below.

	Volume	Coast Guard Equivalent	Contents
1.	46 CFR Parts 1 to 29	None	Subchapter A—Procedures Applicable to the Public. Parts 1 to 9.
		CG-191	Subchapter B—Merchant Marine Officers and Seamen. Parts 10 to 16.
		CG-258	Subchapter C—Uninspected Vessels. Parts 24 to 29.
2.	46 CFR Parts 30 to 40	CG-123	Subchapter D—Tank Vessels. Parts 30 to 40.
3.	46 CFR Parts 41 to 69	CG-176	Subchapter E—Load Lines. Parts 42 to 46.
		CG-115	Subchapter F—Marine Engineering. Parts 50 to 64.
		None	Subchapter G—Documentation and Measurement of Vessels. Parts 66 to 69.
4.	46 CFR Parts 70 to 89	None	Subchapter H—Passenger Vessels. Parts 70 to 89.
5.	46 CFR Parts 90 to 109	CG-257	Subchapter I—Cargo and Miscellaneous Vessels. Parts 90 to 106.
		None	Subchapter I-A—Mobile Offshore Drilling Units. Parts 107 to 109.
6.	46 CFR Parts 110 to 139	CG-259	Subchapter J—Electrical Engineering. Parts 110 to 139.
7.	46 CFR Parts 140 to 155	None	Subchapter N—Dangerous Cargoes. Parts 146 to 149.
		None	Subchapter O—Certain Bulk Dangerous Cargoes. Parts 150 to 154.
8.	46 CFR Parts 156 to 165	CG-268	Subchapter P—Manning of Vessels. Part 157
		None	Subchapter Q—Specifications. Parts 160 to 165.
9.	46 CFR Parts 166 to 199	None	Subchapter R—Nautical Schools. Parts 166 to 168.
		CG-323	Subchapter T—Small Passenger Vessels (Under 100 Gross Tons). Parts 175 to 187.
		None	Subchapter U—Oceanographic Vessels. Parts 188 to 196.
		None	Subchapter V—Marine Occupational Safety and Health Standards. Part 197.

Listed below are the Code of Federal Regulations (CFR) subchapters covering Coast Guard regulations on navigation and navigable waters (Title 33, Chapter I of the CFR). Chapter I consists of a single volume containing 19 subchapters. Subchapters and/or parts of this chapter are not published individually; the entire volume must be ordered.

	Volume	Coast Guard Equivalent	Contents
1.	33 CFR Parts 1 to 199	None	Subchapter A—General. Parts 1 to 26.
		None	Subchapter B—Military Personnel. Parts 45 to 53.
		None	Subchapter C—Aids to Navigation. Parts 60 to 76.
		None	Subchapter D—Navigation Requirements for Certain Inland Waters. Parts 80 to 86.
		None	Subchapter DD—Implementation and Interpretation of the 72 COLREGS. Parts 87 and 88.
		None	Subchapter E—Navigation Requirements for the Great Lakes and St. Marys River. Parts 90 to 92.
		None	Subchapter F—Navigation Requirements for Western Rivers. Parts 95 and 96.
		None	Subchapter G—Regattas and Marine Parades. Part 100.
		None	Subchapter H—Routes for Passenger Vessels. Part 105.
		None	Subchapter I—Anchorages. Parts 109 and 110.
		None	Subchapter J—Bridges. Parts 114 to 118.
		None	Subchapter K—Security of Vessels. Part 122.
		None	Subchapter L—Waterfront Facilities: Security Zones and Regulated Navigation Areas. Parts 125 to 128.
		None	Subchapter M—Marine Oil Pollution Liability and Compensation. Parts 135 and 136.
		None	Subchapter N—Artificial Islands and Fixed Structures on the Outer Continental Shelf. Parts 140 to 147.
		None	Subchapter NN—Deepwater Ports. Parts 148 to 150.
		None	Subchapter O—Pollution. Parts 151 to 159.
		None	Subchapter P—Ports and Waterways Safety. Parts 160 to 165.
		M16752.2	Subchapter S—Boating Safety. Parts 173 to 183.

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