

Proceedings

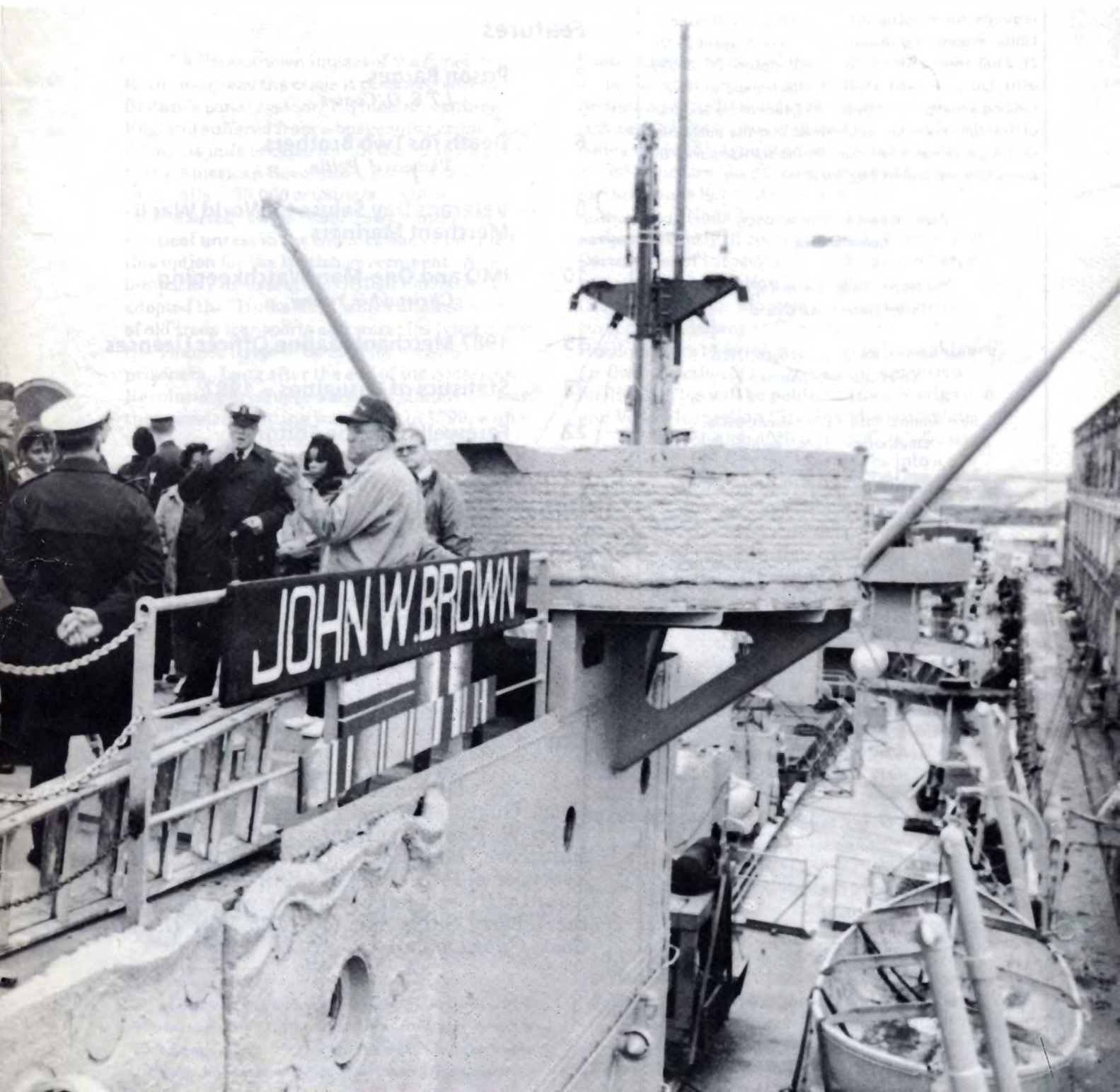
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Cover

In observance of Veterans Day 1989, Coast Guard staff visited the Liberty Ship SS **John W. Brown**, currently under restoration in Baltimore, Maryland. On our cover, Captain Esbensen of Project Liberty Ship, Inc., tells Coast Guard visitors what conditions were like aboard the Liberty Ships during World War II. (*U.S. Coast Guard photo*)

Prison Barges

LT E. O. Coates

A little-known impact of the American Revolution was the crisis it produced within Britain's penal system. Eighteenth-century England suffered from a burgeoning crime rate, filling its jails to capacity. In the 60 years prior to the American Revolution, the overflow from these jails -- 30,000 criminals -- had been "transported" to the American colonies. By 1775, political unrest in the colonies had eliminated this option for the British government. As a temporary measure, the British Parliament adopted the "Hulks Act," which allowed the use of old troop transports and warships lying idle in the Thames River to be used for housing prisoners. Long after the end of the American Revolution, prisoners were still jammed onboard these ancient, rotting warships. In 1790, with the prison population still rising, the British began "transportation" of convicts to Australia.¹

In the 1980s, New York City is faced with the same type of prison overcrowding problem and adopted a similar strategy of bringing "retired" vessels into service as floating jails. As was the case 200 years before, the use of vessels as prisons was initially viewed as only a short-term alternative. However, there is no sign that New York City's prison overcrowding problem is abating. Instead of diminishing, the use of prison ships to house New York City's jail population has increased. Four floating prisons are already in service, and construction is now underway on a brand-new prison barge, the first vessel ever built in this country specifically to house prisoners.

Normally, the Coast Guard does not include permanently moored vessels, such as the

floating restaurants and museums in various seaports throughout the country, within the regulatory jurisdiction of the Coast Guard commercial vessel safety program. Coast Guard policy views this type of vessel as "substantially a land structure,"² and the exercise of regulatory jurisdiction is left to the local municipal authorities. Nonetheless, two of the prison barges currently in operation hold Coast Guard Certificates of Inspection, and the prison barge now under construction is undergoing Coast Guard inspection. Moreover, an initiative is currently underway at Coast Guard Headquarters to develop general policy guidance for the inspection of future floating detention facilities. This will be published as a Navigation and Vessel Inspection Circular when complete.

The evolution of New York City's floating prisons from temporary alternatives into a quasi-permanent solution to the problem of prison overcrowding was not planned. In fact, the City's Corrections Commissioner recently described his goal as simply "to stay ahead of the next surge in jail population."³ The Coast Guard's expanding involvement in this program was also unexpected. Crises breed strange bedfellows. Mingling a maritime safety program with a public safety program has created some unique problems and raised unusual issues. Most of the technical problems are manageable. Yet there are issues raised by this undertaking which may have larger implications for the Coast Guard as well as the City of New York.

Background

In the last 6 years, due mainly to the "crack" epidemic sweeping large U.S. cities,

¹ Robert Hughes, *The Fatal Shore*. New York: Alfred A. Knopf, 1987, p. 42.

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² U.S. Coast Guard Marine Safety Manual (CG-495), Vol. II, "Materiel Inspection." Washington, DC: U.S. Coast Guard, 1977, pp. 30-10:27-28.

³ Celestine Bohlen, "Jail Influx Brings Plan for Two Barges." New York Times, 3 March 1989, B1.

there has been a dramatic increase in drug-related crime in New York City. Since 1983 when the average inmate population was under 9,000, the City's Department of Corrections has been forced to increase its incarceration facilities at a rate of 100 beds a month.⁴ In the fall of 1986, members of the New York City Department of Corrections and the Department of Marine and Aviation (the city agency responsible for the Staten Island ferries) approached the Coast Guard Marine Inspection Office in New York with a proposal to convert two decommissioned Staten Island ferries into prison facilities. Both vessels had been subject to Coast Guard regulation while operating as ferries. According to those making the proposal, conversion of the ferries to meet New York City building codes would be very expensive and would delay placing the ferries into service as prisons by at least a year.⁵ Since these former ferries had been designed and built according to Coast Guard rules and regulations, little modification would be required to bring them into compliance with Coast Guard standards. At the time, two assurances were made to the Coast Guard regarding the intended use of these floating prisons: first, that this would be only a temporary situation, and second, that the converted ferries would be used to house only minimum-security prisoners.

The Coast Guard Marine Inspection Office agreed to accept jurisdiction for these floating prisons. Coast Guard inspectors monitored the conversion of these two ferries into prison facilities, and, in 1987, the new floating prisons were issued Coast Guard Certificates of Inspection and placed into service at docks alongside Rikers Island Detention Facility in New York City.

Later that year, as the prison population continued to increase, New York expanded the floating prison program. In an interesting repeat of history, New York leased two barges, the

Bibby Resolute and the **Bibby Venture**, which had last served as barracks for British troops during the Falklands Islands War. Since these barges were foreign-built and will be operating what is considered a "coastwise" route, U.S. law prohibits them from obtaining a Coast Guard document, and therefore no Certificate of Inspection may be issued. The first of these barges arrived in New York, with a SOLAS certificate,⁶ but without inspection or approval by any U.S. regulatory body. The New York City Board of Corrections, a separate corrections "watchdog" agency within the New York City government, insisted that the Department of Corrections obtain approval from the City Fire Department prior to placing the barges in service.⁷

The approval process for these two barges is still underway. As originally constructed, neither barge can meet New York City fire codes. Instead, the New York Fire Department has developed a Memorandum of Understanding with the Department of Corrections specifying certain modifications which will provide an equivalent level of safety for the barges. In the interim, the New York City Fire Department agreed to allow the Department of Corrections to place prisoners onboard the barges before the required safety alterations were completed, provided that certain temporary measures -- such as increased fire watches -- were taken. The modifications specified in the Memorandum of Understanding are still incomplete, although the barges have been operating as prisons for almost 2 years.⁸

The driving force behind the City's increasing use of the waterfront for housing prisoners has been time. With the prison population more than doubling in 6 years, the city has been desperate for quickly available space. Converting an existing vessel into a prison saves construction time.

⁴ Jerome Pasichow, Associate Corrections Commissioner, New York City Dept. of Corrections, question and answer session, New York University, 31 May 1989, author's notes.

⁵ Patrick Donahue, former inspector, Coast Guard Marine Inspection Office, New York, phone interview with author on 14 July 1989.

⁶ SOLAS refers to the International Convention for the Safety of Life at Sea, which is an international agreement setting vessel safety standards. SOLAS certificates are issued under the auspices of the vessel's flag state.

⁷ Jerome Pasichow, phone interview by author, 17 July 1989.

⁸ Ibid.

In March 1989, New York City awarded a contract for \$125 million to the Avondale Shipyard in Louisiana to build an 800-bed jail barge. In announcing the award, New York Corrections Commissioner Richard Koehler stated, "We are building something of quality, something that will last a long, long time," adding that although high-risk prisoners -- terrorists and escapees -- would not be allowed on the new barge, it would house prisoners considered dangerous.⁹ Clearly, floating prisons are now an integral part of New York City's corrections system.

Fire Safety

The decision by the Department of Corrections to apply for Coast Guard certification for the first two floating prisons was not simply a preference for one bureaucratic procedure over another. The Department of Corrections desired Coast Guard certification because the decommissioned ferries could not be retrofitted to meet New York City Fire Department standards within the necessary time frame. However, this does not imply that Coast Guard regulations are less stringent than those of the City Fire Department. Both sets of regulations adhere to the same basic fire safety principles but vary in the degree of emphasis placed upon different aspects.

A more significant issue is the inherent conflict in philosophies between fire protection and incarceration. This was illustrated by the discovery in early 1989 that locks had been installed on the lifesaving and firefighting equipment aboard one of the converted ferries. The obvious rationale behind this is to prevent vandalism by the prisoners; however, it demonstrates the difficulty in applying general rules to prisons. A delicate balance must be maintained.

Prison design is an example of the complexity of this balance. The goal of a prison is to prevent escape. Access to exits and their number must be strictly limited, whereas Coast Guard vessel regulations require that all

enclosed structures must allow quick and easy escape to occupants. An additional control feature used in prisons is maximization of the guard's ability to observe and monitor prisoners. This calls for large, open areas and windows or opening through walls. The need for this type of breach in structural walls complicates division of a structure into fire zones, an intrinsic principle of structural fire protection.

To resolve this issue, the New York Department of Corrections will attempt to satisfy both the New York Fire Department and Coast Guard requirements. In addition, the Coast Guard is adopting, as an addendum to Coast Guard regulations, the *Rules for Detention and Correction Facilities* published by the National Fire Protection Association (NFPA), which in many areas exceed the requirements of Subchapter H. The NFPA is a non-profit organization which sets many of the standards used by the fire protection industry in this country. This melding of standards may produce a vessel meeting the minimum design criteria of both sets of rules, but rarely exceeding those rules. This drawback was highlighted in the comments the New York City Fire Department provided to the Department of Corrections after reviewing the plans for the new 800-bed prison barge:

In as much as the current trend throughout the country is to improve fire safety in all occupancies, including jails, we would expect that New York City should be in the forefront of providing jail construction that meets the highest standards and set an example for the rest of the country. The acceptance of this barge as described in the proposal of the Department of Correction does not meet this objective.¹⁰

Finally, if a fire occurs on one of these floating prisons, the New York Fire Department, not the Coast Guard, will be the primary response agency. Hence, the choice of regulatory authority for these floating prison facilities may

⁹ Richard Koehler, New York Corrections Commissioner, quoted by Celestine Bohlen in "\$125 Million Jail Barge Is No Mere Ex-Troopship." New York Times, March 22, 1989.

¹⁰ Joseph M. Demeo, Chief of Fire Prevention, New York City Fire Department; letter to New York City Department of Corrections, 9 June 1989.

have wide ramifications. Moreover, failure to involve the local Fire Department may create coordination problems in fighting a future fire aboard one of these floating prisons. (It should be noted that all New York prisons, including the floating prisons, are directly connected with the Fire Department by alarms.)

An example of this type of problem is the case of the *Normandie*. In 1942, this former French luxury liner was being converted into a troopship for the war effort. A minor fire broke out while the ship was moored at Pier 88 in Manhattan. Although the fire initially seemed controllable, it eventually destroyed the entire ship. The cause of the disaster was labeled as "monumental carelessness." A major factor in the extent of this catastrophe was the lack of coordination between the New York City Fire Department and the Coast Guard, resulting in counterproductive firefighting efforts.¹¹

—By stepping in to help New York deal with its prison crisis, the Coast Guard is taking on a difficult task. The outcome of these efforts may

have nationwide implications, as the dual crises of drug-related crime and prison overcrowding are not limited to New York City. This is not the first time that the Coast Guard's New York Marine Inspection Office has risen to a challenge of national significance. This office played the lead role in reflagging the Kuwaiti tankships to convert them to U.S. registration. This action allowed the U.S. Navy to provide protection for these ships, thereby maintaining the flow of oil from the Persian Gulf during the Iran-Iraq war. In extending regulatory jurisdiction to floating prisons, the Coast Guard is entering uncharted waters. The service has a long record of adaptability and resourcefulness; however, it will need to draw on all of these skills to succeed. ■

11 Jeanette Edwards Rattray, *The Perils of the Port of New*

—York. New York: Dodd, Mead & Co., 1973, p. 213.3.

Death for Two Brothers

Thomas J. Pettin

The *Wilderness* was your typical 73-foot, 95 gross ton, steel-hulled commercial fishing vessel. Unfortunately, July 7, 1988 wasn't going to be the typical fishing day for the two Brownsville, Texas, fishermen who were aboard the vessel. The two men -- brothers -- would die from toxic fumes in their vessel's insufficiently ventilated shrimp hold. What makes this case particularly tragic is that one of the brothers died in a futile effort to rescue the other.

This kind of needless death is repeated all too often. Ironically, a couple of personal safety precautions and some simple common sense could have prevented this tragedy. The common shortfall in accidents of this nature always seems to be a *lack of an awareness of the hazards*.

Fishermen engaged in shrimping know that sodium bisulfite can be used to prevent "black spot" in shrimp. Black spot isn't caused

by excessive levels of spoilage bacteria and can't harm the consumer as many people believe, but it makes sense to try and control it since consumers purchase shrimp by the way it looks. Storing shrimp in good-quality melting ice can prevent black spot as well as does sodium bisulfite.

This tragedy occurred while sodium bisulfite was being applied directly on the shrimp. The manufacturer's recommended method of application is to dip the shrimp in a mixture of the chemical and water. Deadly gas results from using an excessive amount of sodium bisulfite, and in this case, the chemical wasn't "cut" with water as recommended. The chemical container labels found in the hold also recommended the chemical be used only in well-ventilated spaces. An investigation held after the casualty revealed that the shrimp hold was grossly underventilated.

The coroner and the Coast Guard

concluded that the most probable cause of the brothers' deaths was asphyxiation either by sulfur dioxide, hydrogen sulfide, or a combination of both. Asphyxia -- or asphyxiation, as it is more commonly known -- is the loss of consciousness as a result of too little oxygen and too much carbon dioxide in the blood.

The exact kind of gas responsible for these deaths could not be determined. Sulfur dioxide gas results from using an excessive amount of sodium bisulfite. Hydrogen sulfide, another potentially deadly gas, may be formed by decomposing fish products and other organic materials. Hydrogen sulfide and sulfur dioxide both are commonly found on fishing vessels. Although both men were fishermen by trade, they were apparently unaware of the deadly consequences that can result from entering a confined space. If fishermen better understood the asphyxiation hazards *that are always present aboard commercial fishing vessels*, they might be more inclined to take precautions to stay alive.

Toxic vapors kill or injure by getting into the bloodstream after being absorbed through mucous membranes in the lungs, eyes, nose, or throat. High concentrations of toxic vapors can kill or injure immediately by destroying a particular organ or attacking body cells. Repeated exposure to lower concentrations of certain chemical vapors may not affect an individual immediately. It's possible that harmful effects may not become apparent for years afterward.

Coast Guard data show that the majority of asphyxiation and toxic vapor casualties involve commercial fishermen *and involve death*. Fishermen can die quickly by inhaling too much hydrogen sulfide gas. This gas is always present around rotting fish garbage and fish that haven't been stored at the right temperature. You can't see hydrogen sulfide but you should be able to detect it because of its particularly offensive, rotten-egg odor. (Note: Many persons are congenitally unable to detect this smell.) In large concentrations, the gas quickly desensitizes the nostrils and becomes odorless, which makes it extremely dangerous.

Commercial fishing is one of the country's most dangerous occupations. If fishermen follow several simple precautions, they can significantly improve their personal safety. For starters, fishermen must remember there is always an onboard asphyxiation hazard associated with underventilated holds or holds

that have been closed for an extended period. The presence of lethal gas or the absence of enough oxygen in these holds can prove fatal. Devices specifically designed for testing a hold's atmosphere should be readily available and accessible. *If testing instruments are not available, you must assume that entering the underventilated area will kill you.*

Prevention A Must

To prevent decaying fish products from forming gas, holds must be flushed with clean water as soon as possible after off-loading. Fishermen must remember the following:

- Never attempt to rescue anyone without assistance.
- Never attempt a rescue without wearing the proper respiratory equipment and a lifeline.

Filter and canister-type respirators chemically filter out destructive vapors -- they don't provide oxygen. Is it worth gambling with the odds by not taking the proper precautions? The stakes are fatal. The Coast Guard has caseloads of files that can prove the odds are against you.

Multiple tragedies, such as the one described in this article, occur because the rescuer doesn't stop to think about the danger that claimed the victim. Instead, the would-be rescuer reacts on impulse. He probably doesn't even think about wearing the proper equipment or realize that holding his breath doesn't make a difference. Heavy vapors will be absorbed through the mucous membranes of the eyes, nose, throat, or lungs, and eventually kill.

Remember: Use chemicals only in well-ventilated areas, on deck if possible. Fish holds and other confined spaces always should be well-ventilated. Entering and working in a fish hold or other underventilated area without proper safety precautions is the deadliest risk a fisherman can take. ■

Mr. Pettin is a Program Analyst in the Coast Guard's Marine Safety Evaluation Branch.

Veterans Day Salute to World War II Merchant Mariners

For those working in the maritime sector, the historical accounts of the merchant marine in World War II are rather well known. But the sacrifices our sailors gave then are not so well known to others, especially to the post-war "baby boomers" having little or no contact with the marine transportation industry. Coast Guard Headquarters' Merchant Vessel Personnel Division took the occasion of Veterans Day to conduct two related activities: to honor the merchant mariners of World War II and to educate themselves about the rigors and demands of life on a merchant ship at sea during the war.

The Division has been tasked with determining the veterans' status for the merchant mariners who served our country during World War II. This has been a labor-intensive effort; thousands of records over 40 years old had to be retrieved from the Federal Records Center and reviewed to credit each applicant with all of the qualifying service they earned during the period of December 7, 1941 through August 15, 1945. The Merchant Vessel Personnel Division staff have processed over 72,000 applications during the past 18 months. The majority of the staff are not old enough to have lived through World War II, much less fully understand what life at sea during the war was really like. A Liberty Ship, being a major factor in the allied victory, would be an excellent place for the Division staff to meet some veterans and gain this knowledge.

Captain Grady, Chief of the Division, and his staff got a first-hand history lesson with their visit to and tour of the Liberty Ship SS John W. Brown, moored in nearby Baltimore, Maryland. Thanks to the courtesy of the men and women of Project Liberty Ship, Inc., approximately 70 Headquarters personnel saw for themselves the austere living and working conditions our mariners endured. "The volunteers of Project Liberty Ship made the SS John W. Brown come alive for us with their historical knowledge and entertaining anecdotes," reported LCDR Tim Healey, Chief of the Merchant Marine Veterans Branch. The impact on each of the Coast Guard military and civilian personnel in attendance was to instill a more personal involvement as they continue to respond to hundreds of veteran's inquiries each week.

This renewed commitment to provide the best possible service to our mariners was further buoyed as Captain Grady placed a memorial wreath on the ship in honor of those mariners who sacrificed so much for their nation in World War II. Captains Paul Esbensen, Brian Hope, and Herb Groh of Project Liberty Ship, Inc., participated in the ceremony.

Those interested in the Liberty Ships, their history, and the restoration of the SS John W. Brown in particular, may contact Project Liberty Ship, Inc., P.O. Box 8, Long Green, MD 21092. For readers on the West Coast, a similar effort is underway in California. That group may be contacted at the following address: SS Jeremiah O'Brien, Fort Mason, San Francisco, CA 94123-1382. ■



On Veterans Day 1989, staff from the Coast Guard's Merchant Vessel Personnel Division got a firsthand glimpse of what living conditions were like aboard ship during World War II. The staff toured the Liberty Ship **John W. Brown**, currently under restoration in Baltimore, Maryland. Above (left to right), Captain Hope, Captain Groh, and Captain Esbensen, all of Project Liberty Ship, Inc., listen to Coast Guard Captain Fred Grady as he presents a wreath to honor the merchant mariners who served their country during World War II. Looking on are LCDR Timothy Healey and Mrs. Justine Bunnell, both of the Merchant Vessel Personnel Division. Below, Captain Esbensen takes his tour group topside and shares stories of troops aboard the Liberty Ships.

IMO and One-Man Watchkeeping

Christopher Young

The current international trend toward smaller crews on large ships includes efforts to design a console-style workstation on the bridge to allow an individual to act as his or her own helmsman and lookout while serving as officer of the navigational watch at night. The primary assumption underlying this effort is that many routine duties on the bridge can be automatically performed by sophisticated instruments and can supply the officer of the watch all the information needed to navigate the vessel safely under many circumstances.

The enthusiasm for allowing large ships to be navigated with a single-person watch is counterbalanced by the concern that this arrangement might subject the vessel to a higher degree of risk from human error.

The Maritime Safety Committee (MSC) of the International Maritime Organization first gave consideration to this matter at its 54th session in the spring of 1987, when Norway advised the Committee that it had authorized certain vessels to participate in trials of one-man watchkeeping.

In April 1988, at its 55th session, the Committee asked two of its subcommittees to examine the issues relating to the officer of the navigational watch acting as sole lookout at night. The MSC noted that the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 (STCW 78) allows the officer in charge of the watch to act as the sole lookout "in daylight" under certain circumstances (paragraph 9b of Regulation II/1 of STCW 78).

While the MSC has not yet reached any conclusions on whether such a practice should be permitted at night, the Committee has agreed that "evaluation trials should be controlled by strictly laid down conditions to ensure they are conducted in a safe and orderly manner" (MSC 55/25, 14.2.10). The Committee requested its

Subcommittees on Safety of Navigation (NAV) and on Standards of Training and Watchkeeping (STW) jointly to develop "clear guidelines" for the conduct of "trials and experiments of single-man watchkeeping."

At its 35th session in January 1989, the NAV Subcommittee established a Working Group to examine this matter. This Working Group prepared a document entitled, "Draft Provisional Guidelines for Conducting Trials and Experiments in which the Officer of the [Bridge and] Navigational Watch Acts as the Sole Look-Out [During Periods of Darkness] [When there is no Daylight]." The text of this document is printed below for the convenience of *Proceedings* readers. Copies of the complete report of the Working Group (IMO documents NAV 35/WP.6 and NAV 35/WP.6/Add. 1) are available from the Coast Guard's Merchant Vessel Manning Branch upon written request to Commandant (G-MVP-4), U.S. Coast Guard, 2100 Second St., SW, Washington, DC 20593-0001.

Although NAV did not reach any final conclusions on this issue at its 35th session, the Subcommittee agreed that "restricted trials of single-man watchkeeping at night under strictly controlled conditions are necessary to determine the essential criteria under which such watchkeeping would be safe and whether or not it could be permitted."

Members of NAV were invited to consider the draft guidelines and submit comments and proposals to their next session. (The 36th session has been preliminarily scheduled for September 1990.) The Subcommittee also invited members to submit proposals for a format to be used for reporting to IMO the results of any trials or experiments which might be conducted, "to provide a uniform basis for their evaluation."

Meanwhile, NAV also recommended that its sister subcommittee, STW, consider the draft provisional guidelines and develop additional text specifically for the section on "qualifications and duties of the officer of the navigational

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watch," which was not developed by the NAV Working Group.

The draft provisional guidelines will be placed on the agenda of the next (21st) session of STW (preliminarily scheduled for January 1990). Any comments or texts which may be developed by STW will then be referred back to NAV. After NAV has completed its work on the guidelines, the draft will be submitted to MSC for its consideration.

Once the guidelines have been adopted by IMO, Administrations will be expected to comply with them in authorizing vessels to engage in experiments with single-man watchkeeping. However, NAV has expressed the view that "the recommended measures should be considered as guidance to Administrations for uniform application and not as an authorization or as a basis for equivalent arrangements for unrestricted application."

NAV Working Group Proposal

Representatives of 13 countries and 4 international organizations participated in the Working Group during its four sessions of work from Tuesday afternoon to Thursday morning during the week of the Subcommittee's 35th session (23 to 27 January 1989).

As in most IMO bodies, the Working Group operated by consensus. In other words, discussion of alternatives continued until the group could agree to a result without any member expressing an objection. In cases where points of view could not be resolved, but where the group wanted to retain a proposal for further consideration, brackets were placed around the appropriate words or phrases.

In developing the draft provisional guidelines, the Working Group considered several documents which had been submitted to the 35th session of NAV. Drafts for comprehensive guidelines were submitted by both the Federal Republic of Germany (NAV 35/10/1) and Norway (NAV 35/10/3 and NAV 35/10/5); related proposals were submitted by Australia (NAV 35/10/4), Canada (NAV 35/10/2); and oral comments were made during the plenary discussion by several delegations including the United States. After considering the broad differences among the various proposals, the Working Group decided it would not use any single note as a basic text. Instead, the Group began by agreeing to a list of areas or

issues which needed to be addressed in the draft guidelines. These areas became the section headings of the draft, as follows:

- Purposes
- Roles of Administrations
- Operational and Environmental Conditions which should exist before trials are conducted
- Bridge Layout and Instrumentation
- Duties of the Shipowner and Master
- Watch Alarm (or monitoring) Systems
- Reports of Trial Results
- Qualifications and Duties of the Office of the Navigational Watch (to be developed by STW)

The Working Group then agreed to a set of broad principles under each of these headings. Each principle was adopted by consensus. For example, the group agreed that the guidelines should be drafted in such a way as to avoid, as far as possible, distinguishing between large and small ships, or between trials which may be conducted in coastal waters or on the high seas. The group also agreed in principle that the guidelines should be flexible enough to allow for technical innovation.

The chairman then introduced each section by re-reading the agreed principles and invited the members to draw on the submitted documents (or on new ideas) and propose any text which might be inserted in the draft. All proposals were included in this preliminary working draft, even if a consensus did not exist, as long as the proposals were generally compatible with the agreed principles. At this stage, some sections contained many suggestions while others could not be developed beyond the expression of the generally agreed principles.

The IMO secretariat then produced an informal document with the draft text for the Working Group's convenience. The group went over each section a third time to refine the language or to determine whether more effort would be necessary to find a text on which all could agree.

The most complex sections, and the sections on which most discussion took place, were those on instruments to be available to the watchkeeper on the bridge and the criteria for the "dead-man" watch alarm system. The Group was not able to agree to these sections until the very last minutes of the time available.

Consequently, these sections had to be issued as an addendum to the report of the Working Group (NAV 35/WP.6/Add.1) immediately prior to the chairman's oral report to the subcommittee. In fact, with respect to the watch alarm system, the Working Group did not have sufficient time to consider a joint proposal on the alarm system prepared by Norway and the Federal Republic of Germany, and this proposal was issued at the conclusion of the session as a separate document for consideration of the subcommittee (NAV 35/WP.8).

The substance of three of the sections in the draft provisional guidelines is discussed below:

1. With respect to the operational and environmental conditions, the draft guidelines assume that trials would be conducted in accordance with the principles laid down in Regulation II/1 of STCW 1978, *notwithstanding* the reference to "in daylight" in paragraph 9(b). The Working Group agreed that passenger ships should not participate in trials until results of trials with other types of ships are available.

2. With respect to the instrumentation on the bridge, the draft guidelines recommend that a ship participating in a trial should be equipped with certain basic items of equipment, plus a watch alarm system. Administrations are then recommended to consider the need for and benefits of other items of equipment which might ease the workload of the watchkeeper.

3. The Working Group was not able to develop the technical details of a watch alarm system; but the draft guidelines describe the general functional requirements for such a system. For example, the system should indicate that an alert officer is present on the bridge; and it should require acknowledgement at the work station in a manner which does not interfere with performance of watchkeeping duties; and the system should immediately warn the master if a proper acknowledgement has not been made.

Draft Provisional Guidelines

Following is the text of the Draft Provisional Guidelines as they were prepared by the Working Group of the IMO Subcommittee on Safety of Navigation in January 1989:

NAV 35/WP.6

ANNEX

DRAFT PROVISIONAL GUIDELINES FOR CONDUCTING TRIALS AND EXPERIMENTS IN WHICH THE OFFICER OF THE [BRIDGE AND] NAVIGATIONAL WATCH ACTS AS THE SOLE LOOK-OUT [DURING PERIODS OF DARKNESS] [WHEN THERE IS NO DAYLIGHT]

1 Purposes

1.1 To collect information which will facilitate deliberations by the Organization on the practice of allowing the officer of the navigational watch to act as sole look-out in periods of darkness.

1.2 To determine whether or under what conditions the officer of the navigational watch can safely perform the duties of the look-out in periods of darkness.

2 Role of Administrations

2.1 To authorize ships individually to participate in trials and experiments.

2.2 To monitor trials and experiments in accordance with these guidelines.

2.3 To take into consideration all relevant international instruments in authorizing trials.

2.4 To inform the Organization when trials and experiments are to be carried out and to report the results of such trials to the Organization.

3 Operational and environmental conditions which should exist before trials are conducted

3.1 Passenger ships [and ships carrying oil, gas, or chemicals in bulk] should not be allowed to

participate until the results of trials in other types of ships are available.

3.2 The authorization for conducting trials and experiments with the officer of the watch as sole look-out in periods of darkness is based on the condition that all the basic principles in keeping a navigational watch as specified in Regulation II/1 of the 1978 STCW Convention, with regard to watch arrangements, fitness for duty, navigation, navigational equipment, navigational duties and responsibilities, look-out (notwithstanding the words "in daylight" in paragraph 9b), navigation with pilot embarked and protection of the marine environment, will be observed and are being taken into account.

4 Bridge layout and instrumentation

4.1 The bridge design, i.e., bridge configuration, arrangement of consoles and equipment location, should enable the officer of the watch to perform navigational duties and other functions allocated to the bridge as well as maintain a proper look-out by sight and hearing unassisted under normal operating conditions, from a convenient position on the bridge, hereafter referred to as a "workstation."

4.2 A workstation for navigation and traffic surveillance/manoeuvring should be arranged to enable efficient operation by one person under normal operating conditions.

4.3 From a workstation for performance of navigation, traffic surveillance and manoeuvring, the field of vision should enable observation of all objects which may affect safe conning of the ship. The field of vision from a workstation should be in accordance with the "Guidelines on navigation bridge visibility" as specified in MSC/Cir.403 [as it applies to new ships].

4.4 A workstation for navigation and traffic surveillance/manoeuvring should enable the officer of the watch to:

- determine and plot the ship's position, course, track and speed,
- analyse the traffic situation,

- decide on collision avoidance manoeuvres,

- alter course,

- change speed,

- effect internal and external communications related to navigation and manoeuvring, radio communication on the VHF,

- give sound signals,

- hear sound signals,

- monitor course, speed, track, propeller revolutions (pitch), rudder angle and depth of water,

- record navigational data.

4.5 Ships participating in trials and experiments should be equipped in accordance with relevant international instruments including the following:

- Radar,

- Electronic position fixing system,

- Gyro compass systems,

- Auto steering systems,

- Speed log system,

- Echo sounder system,

- Whistle control system,

- Internal communication system, and

- Relevant external communication system.

4.6 These ships should also be equipped with the watch alarm system as described in section 6. This system should be functioning properly during any trial or experiment.

4.7 Administrations should consider the need for and benefits of the following equipment

when authorizing ships to participate in trials and experiments:

- ARPA,
- Automatic graphical position display,
- An appliance for recording VHF calls,
- A page system and means of acknowledgement,
- A rasterscan daylight-viewing radar,
- A NAVTEX receiver for automatic reception, and
- Monitoring systems.

5 ~~Duties of the shipowner and master~~

5.1 The shipowner should ensure that the trials are established to plans mutually agreed with the Administration, and that adequate instructions are provided to the Master. The Master should ensure the proper conduct of the trials, including the circumstances under which the trials must be suspended to ensure that safety is not compromised and that these instructions are met, taking into account prevailing operational circumstances.

5.2 The Master should ensure that the officer of the watch should only continue to act as the sole lookout when in that officer's judgment the workload is well within his capacity to maintain a proper lookout and full control of the prevailing situation.

5.3 The shipowner should, in cooperation with the Master, report the results of the trials to the Administration.

6 ~~Watch alarm~~

6.1 A system is needed to indicate that an alert officer of the watch is present on the bridge.

6.2 This system should require acknowledgement at fixed intervals up to a maximum of 12 minutes or the system should provide another effective means of verifying that the bridge is being manned by an alert officer of the watch.

6.3 This system should require acknowledgement at the workstation by the officer of the watch in some manner which does not interfere with performance of his navigational and look-out duties.

6.4 The system should immediately warn the master when a proper acknowledgement has not been made.

6.5 The system should be so designed and arranged that it cannot be operated in an unauthorized manner.

7 ~~Reports of trial results~~

The Administration should establish systems and procedures for registration of operational conditions and the ability of the officer of the navigational watch to maintain a proper lookout while performing other bridge duties during trials. The report of trial results submitted to the Organization should contain sufficient objective detail to indicate how the guidelines were implemented for each trial and the effectiveness of the guidelines.

8 Qualifications and duties of the officer [of the navigational watch]

To be developed by the STW Sub-Committee.■

1987 Merchant Marine Officer Licenses Issued

Deck Licenses

| | Issues | Endorsements | Failures | Renewals |
|---|--------|--------------|----------|----------|
| Master, Any Gross Tons, Ocean | 128 | 43 | 4 | 597 |
| Master, Near Coastal, Any GT | 13 | 10 | 0 | 39 |
| Chief Mate, Oceans, Any Gross Tons | 77 | 75 | 1 | 205 |
| Chief Mate, Near Coastal, Any GT | 1 | 0 | 0 | 1 |
| Second Mate, Oceans, Any GT | 157 | 33 | 6 | 216 |
| Second Mate, Near Coastal, Any GT | 2 | 0 | 0 | 0 |
| Third Mate, Oceans, Any Gross Tons | 315 | 33 | 15 | 360 |
| Third Mate, Near Coastal, Any GT | 4 | 0 | 0 | 1 |
| Master, Oceans or Near Coastal, Not More Than 1600 GT | 248 | 383 | 26 | 731 |
| Mate, Oceans or Near Coastal, Not More Than 1600 GT | 97 | 55 | 34 | 83 |
| Master, Oceans or Near Coastal, Not More Than 500 GT | 164 | 101 | 27 | 36 |
| Mate, Oceans or Near Coastal, Not More Than 500 GT | 34 | 20 | 6 | 56 |
| Master, Oceans or Near Coastal, Not More Than 200 GT | 94 | 62 | 7 | 351 |

Deck - Continued

| | Issues | Endorsements | Failures | Renewals |
|---|--------|--------------|----------|----------|
| Mate, Near Coastal, Not More Than 200 Gross Tons | 81 | 8 | 15 | 6 |
| Master, Near Coastal, Not More Than 100 GT | 1857 | 564 | 100 | 2711 |
| Master, Uninspected Fishing Industry Vessels | 57 | 73 | 2 | 119 |
| Mate, Uninspected Fishing Industry Vessels | 25 | 22 | 0 | 8 |
| Master, MODUs* | 389 | 1 | 6 | 38 |
| Mate, MODUs | 30 | 0 | 0 | 6 |
| Master, Great Lakes and Inland, Any GT | 30 | 23 | 1 | 228 |
| Master, Inland, Any GT | 24 | 12 | 1 | 179 |
| Mate, Great Lakes and Inland, Any GT | 15 | 22 | 0 | 107 |
| Master, Great Lakes and Inland, Not More Than 1600 GT | 27 | 10 | 3 | 28 |
| Mate, Great Lakes and Inland, Not More Than 1600 GT | 11 | 2 | 0 | 3 |
| Master, Great Lakes and Inland, Not More Than 200 GT | 12 | 13 | 2 | 13 |
| Mate, Great Lakes and Inland, Not More Than 200 GT | 4 | 0 | 0 | 0 |
| Master, Inland, Not More Than 100 GT | 923 | 87 | 81 | 868 |

*MODUs - Mobile Offshore Drilling Units

Deck - Continued

| | Issues | Endorsements | Failures | Renewals |
|--|--------|--------------|----------|----------|
| Limited Master of Great Lakes and Inland, Not More Than 100 GT | 1132 | 110 | 130 | 1174 |
| First Class Pilot | 106 | 452 | 4 | 546 |
| Operator of Uninspected Towing Vessels | 384 | 86 | 65 | 4410 |
| Second Class Operator Uninspected Towing Vessels | 36 | 9 | 14 | 22 |

Engineers

| | Issues | Endorsements | Failures | Renewals |
|---|--------|--------------|----------|----------|
| Chief Engineer, Motor | 29 | 51 | 0 | 65 |
| First Assistant Engineer, Motor | 53 | 53 | 0 | 33 |
| Second Assistant Engineer, Motor | 49 | 52 | 1 | 44 |
| Third Assistant Engineer, Motor | 107 | 21 | 2 | 221 |
| Chief Engineer, Steam | 43 | 5 | 1 | 172 |
| First Assistant Engineer, Steam | 52 | 8 | 0 | 99 |
| Second Assistant Engineer, Steam | 77 | 17 | 1 | 138 |
| Third Assistant Engineer, Steam | 66 | 10 | 0 | 93 |
| Chief Engineer, Steam and Motor, Any Horsepower | 11 | 4 | 0 | 154 |

Engineers - Continued

| | | Issues | Endorsements | Failures | Renewals |
|--|-----|--------|--------------|----------|----------|
| First Assistant Engineer, Steam and Motor, Any Horsepower | | | 7 | 2 | 41 |
| Second Assistant Engineer, Steam and Motor, Any Horsepower | 46 | | 7 | 3 | 49 |
| Third Assistant Engineer, Steam and Motor, Any Horsepower | 357 | | 9 | 5 | 216 |
| Chief Engineer, Limited Oceans | 52 | | 108 | 5 | 327 |
| Chief Engineer, Limited, Near Coastal | 15 | | 9 | 2 | 35 |
| Assistant Engineer, Limited | 34 | | 6 | 12 | 27 |
| Designated Duty Engineer | 72 | | 23 | 22 | 3 |
| Chief Engineer, Uninspected Fishing Industry | 24 | | 13 | 3 | 0 |
| Assistant Engineer, Uninspected Fishing Industry | 4 | | 0 | 0 | 5 |
| Chief Engineer, MODUs | 6 | | 0 | 0 | 23 |
| Assistant Engineer, MODUs | 1 | | 0 | 0 | 0 |

MODUs - Mobile Offshore Drilling Units

Staff Officer Certificate of Registry Issued

| | Issues |
|----------------------------|--------|
| Chief Purser | 11 |
| Purser | 4 |
| Senior Assistant Purser | 2 |
| Junior Assistant Purser | 4 |
| Medical Doctor | 6 |
| Professional Nurse | 5 |
| Marine Physician Assistant | 3 |
| Hospital Corpsman | 6 |

Operator Licenses

| | Issues | Endorsements | Failures | Renewals |
|-------------------------------|--------|--------------|----------|----------|
| Uninspected Passenger Vessels | 1686 | 141 | 217 | 1780 |

Radio Officer License

| | Issues | Endorsements | Failures | Renewals |
|----------------|--------|--------------|----------|----------|
| Radio Officers | 21 | 1 | n/a | 216 |

Miscellaneous Information

| | Issues | Endorsements | Failures | Renewals |
|---------------------------------------|--------|--------------|----------|----------|
| Assistance Towing Endorsements | 49 | 88 | 1 | 31 |
| Temporary Liftboat License, Deck | 4 | 1 | 0 | 0 |
| Temporary Liftboat License, Engineers | 3 | 0 | 0 | 0 |

Summary of All License Transactions

| | Issues | Endorsements | Failures | Renewals |
|-------------------------------|--------------|--------------|------------|--------------|
| Deck (Less OUTV & 2/C OUTV*) | 6033 | 2202 | 470 | 9300 |
| OUTV & 2/C OUTV | 420 | 95 | 79 | 4432 |
| Engineer | 1122 | 383 | 59 | 1705 |
| Staff Officer | 41 | n/a | n/a | n/a |
| Operator | 1686 | 141 | 217 | 1780 |
| Radio Officer | 21 | 1 | 0 | 216 |
| Radar Observer | n/a | 3520 | n/a | n/a |
| TOTALS | 9323 | 6342 | 825 | 17433 |
| TOTAL ALL TRANSACTIONS | 33923 | | | |

*OUTV & 2/C OUTV - Operator, Uninspected Towing Vessels and Second Class Operator, Uninspected Towing Vessels

Comparison

| | 1985 | 1986 | 1987 | 1988 |
|-----------------------------|--------------|--------------|--------------|--------------|
| Licenses Issued and Renewed | 29980 | 32527 | 32470 | 26756 |
| Endorsements | 3331 | 3752 | 3634 | 2822 |
| Failures | 523 | 1283 | 1105 | 825 |
| Radar Observer | 8291 | 3513 | 3226 | 3520 |
| TOTAL TRANSACTIONS | 42125 | 41030 | 40435 | 33923 |

New Publications

Stapleton's Powerboat Bible

Selecting and outfitting a serious cruiser with appropriate safety, navigation, communications, and auxiliary equipment involves hundreds of decisions and potentially expensive pitfalls for the unwary. Sid Stapleton has spent the last 20 years exploring the world's prime cruising grounds and mining the collective wisdom of experienced boat owners. The result is this distillation of the best advice on how to put together a boat tailor-made to any boat owner's needs and cruising aspirations.

Stapleton is uniquely practical and plainspoken in his advice on how to shop at a boat show, how to arrive at a fair offering price, how to assess marine insurance, and what to consider in registering a boat. He names names and points fingers in telling which marine electronics and communications equipment stands up to the elements and the test of time and in reviewing anchors and tenders. Years of experience inform his discussion of cruising health, safety, and security and the best way to plan for a long or short voyage. In Stapleton's *Powerboat Bible*, the reader will find all the information necessary to save time, money, and no end of headache en route to the perfect boat and a favorite anchorage.

Available from William Morrow and Co., 105 Madison Avenue, New York, NY 10016 for \$22.95.

The Guide to High Performance Powerboating

This is the definitive guide to all aspects of competitive and recreational high-speed powerboating, the most visible and fastest growing segment of the powerboat market today. Every facet of this dramatic sport is covered, from its dynamic history to buying the best boat to achieving peak performance at 90 miles per hour in any kind of sea.

Beginning with the earliest days of powerboat racing, the *Guide* surveys the colorful exploits of the sport's early heroes, the interest of such high-profile figures as President George

Bush in high-speed powerboating, and the latest long distance runs by the likes of actors Don Johnson and Chuck Norris. Along the way, author Joanne Fishman traces the evolution of the construction, power system, and design breakthroughs behind today's state of the art production boats.

The *Guide* then explains and analyzes the contemporary high-performance racing scene, especially the explosive growth of offshore and unlimited racing -- the glamour events of powerboat racing -- and offers advice on how to get on the racing circuit. Covering every major modern manufacturer and designer, the *Guide* goes on to examine the latest developments in hull design and construction, engines, and other equipment, all of which have been tested out on the race course and integrated into the leading production boats.

Gripping color photographs of boats speeding, flipping, and somersaulting -- taken by offshore racing's leading photographer, Forest Johnson -- combine with an extensive glossary, listings of powerboat records and statistics, technical information on all classes of powerboat racing, and many other special features to make the *Guide to High Performance Powerboating* the one book that every high speed powerboat enthusiast must own.

Available from William Morrow and Co., 105 Madison Avenue, New York, NY 10016 for \$25.00.

Unfinished Voyages: A Chronology of Shipwrecks

Unfinished Voyages draws together the intricate strands that make up the history of shipwrecks in the continental shelf waters of the northeastern United States. Illustrated with photographs of shipwrecks from New York to northern Maine, the book describes some of the most noteworthy shipwrecks to occur on these shores over a 350-year period.

Included in the book are the early shipwrecks of Captain Adrian Block's *Tiger* in New York, the HMS *Astrea* in New Hampshire, and the many warships sunk in the Penobscot

Disaster during the American Revolution. The book further details the tragedies occurring in Gloucester, Boston, and Cape Cod during the Triple Hurricanes of 1839 when maritime fleets of the northeast were devastated in a series of December storms. (These were the storms that moved Henry Wadsworth Longfellow to pen his famous poem, "The Wreck of the Hesperus.")

The author also describes the activities leading to the formation of the Life-Saving Service and how, often against terrific odds, their jobs were accomplished. The lifesavers' work on the Long Island wreck of the *Circassian* forms the background for the story of this famous shipwreck. The book gives us a fresh look at

some of the more interesting maritime activities along these shores with descriptions of the loss of the world's largest wooden sailing cargo carrier, the *Wyoming*, and how she sailed her last days. Also described is the last voyage of the mysterious *Portland* and her frail human cargo.

The appendices are a valuable reference to the researcher and historian as well as the armchair sailor. A major addition to this work is a list of over 5,000 shipwrecks that have occurred during the period.

Unfinished Voyages is available from Lower Cape Publishing Co., Orleans, MA, 02653 for \$35.00. ■

Farewell from the Editor

Here we go again!

To those of you who are long-time *Proceedings* readers, it might be hard to believe that 5 years have passed since I took over the magazine's editorial reins. It is now time for me to move on. I've accepted an editorial position with another government agency, and the Coast Guard hopes to have hired the new *Proceedings* editor by the time this issue is printed and delivered.

Our new editor will need some time to learn Coast Guard procedures, printing requirements, and the desktop publishing operation. You may experience a delay before the March-April 1990 issue is published, but please be patient. It will be distributed as soon as possible.

Thanks to all of you. I've had a terrific time and learned more about the maritime industry than I ever thought possible.

I wish all of you the very best, and God bless.

Sharon

Statistics of Casualties -- 1987

Annually, the Coast Guard's Marine Investigation Division (G-MMI) publishes a summary of the involvements of commercial vessels and related personnel in various types of casualties. The primary source of this data is the CASMAIN database which was created to satisfy the internal and external demand for commercial vessel casualty information. The current information base has been continuously updated, maintained, and improved since 1981.

Marine Casualty Reporting

The authority to require notification and reporting of a marine casualty is contained within 46 USC 6101. The authority to require reporting of casualties involving offshore oil and gas exploration, production, and support activities is derived from the Outer Continental Shelf Lands Act, 43 USC 1331, *et. seq.*

The primary vehicle for reporting marine casualties is the Form CG-2692, Report of Marine Accident, Injury, or Death. The form provides instructions and reporting criteria for casualties involving vessels, mobile offshore drilling units, outer continental shelf facilities and commercial diving as well as the personnel involved in these activities (see figure 1). Whenever possible, the form is completed by those directly involved in the casualty, i.e., owner or operator of a vessel or facility. Descriptive information and instructions are included to aid in the completion of specific sections. The completed form is submitted to one of the many local field offices (Marine Safety Office, Marine Safety Detachment, Marine Inspection Office) for verification, screening, and possible further investigation. In the latter case, the completed reports are forwarded to Coast Guard headquarters for further action and comment and inclusion in the historical files. It should be noted that report of incidents not meeting the specified criteria are closed to file at the field unit level and do not appear in this summary.

Note: *The reporting threshold for personnel injuries (incapacitated for 72 hours or more) was eliminated in 1987. This will account for any major increases in the numbers of injuries between 1987 and years prior to that.*

Casualties Excluded From This Report

Casualties involving only pleasure craft are not represented in these statistics. These incidents are included in the report published yearly by the Office of Navigation Safety and Waterway Services, part of the Coast Guard's Auxiliary, Boating, and Consumer Affairs Division (G-NAB). There is also reason to suspect that a small percentage of casualties meeting the criteria are not reported due to ignorance of the requirement to do so.

Major Marine Casualties

Major marine casualties are those incidents involving a vessel, other than a public vessel (as defined in 46 CFR 4.03-40), which result in one of the following:

- The loss of six or more lives.
- The loss of a mechanically propelled vessel of 100 or more gross tons (GT).
- Property damage initially estimated at \$500,000 or more.

"Serious threat" (as determined by the Commandant with concurrence by the National Transportation Safety Board's Chairperson) to life, property, or the marine environment by hazardous materials.

There were a total of 49 major marine casualties in 1987. Of this number, two incidents were of particular note.

The first, the grounding of the M/V *Fern Passat* in the entrance to the St. Johns River on the northeast coast of Florida, was significant in

that it resulted in a major oil spill which affected a part of Alaska and is still the worst for a

very different reason. The tankship **S.S. Manhattan**, a vessel specifically designed for the carriage of oil in ice-bound waters, was the first tankship to transit the treacherous Northwest Passage. The design proved impractical, and the vessel was moored in a dormant status in the Far East for many years. The **S.S. Manhattan** was torn from its mooring, blown aground, and destroyed during a typhoon.

Statistical Representations

It is not our intent to provide an analysis of the data contained in these tables. It is important, however, to identify some common misconceptions encountered if information such as this is to be interpreted properly.

Statistical analysis is often maligned and accused of representing only what is desired by those making the analysis. A thorough understanding of the raw information is essential in performing any type of analysis.

A Case in Point

There are many different types of commercial vessels, each with its own special considerations. Generally, the design, construction, and operation of a vessel are dependent upon the segment of maritime commerce in which it is employed.

There are significant differences in the fleet sizes of the various types of commercial vessels. The generalization can be made that the greater the population of a particular type of vessel, the greater the chances that a member of that population will be involved in a casualty. This statement assumes that a larger population will result in more operational activity. The term which is most often used to describe this aspect of analysis is "exposure." It is important to bear this in mind when comparing the safety records of different vessel types. For the purpose of this discussion, we will concentrate on the three largest populations of commercial vessels. The groups selected are fishing vessels, tugs/towing vessels, and small passenger vessels of less than 100 gross tons. The three categories mentioned will be detailed separately.

Fishing Vessels

This type of vessel constitutes the largest fleet size of all the types. In 1987, there were an estimated 30,000 documented fishing vessels. Of these vessels, there were 1,055 involvements resulting in 58 deaths.

Towing/Tugboats

The second largest of the three types, the towing vessel population, is estimated at approximately 5,100 documented vessels. This population suffered 1,200 casualties resulting in 3 deaths.

Passenger Vessels (less than 100 gross tons)

The third and final vessel type is the small passenger vessel. There are approximately 4,800 documented vessels in this category. In 1987, there were 242 involvements resulting in 12 fatalities.

The natural inclination would be to concentrate on the number of fatalities alone. Among the three groups, the fishing vessel fleet would certainly draw the most attention. It would be natural to assume that the fishing vessel fleet was an unsafe place to be employed. However, let's look at these numbers in perhaps a more meaningful way. The first step in the process is to invoke a common denominator. It is virtually meaningless to compare such diverse numbers as are presented in the above paragraphs, so let's present them as the rate of deaths per 100 vessel involvements. For the fishing vessel fleet, this yields 5.5 deaths per 100 involvements. The towing fleet yields .25 deaths per 100 involvements. The surprise comes when we look at the final group. The passenger vessel category yields 4.95 deaths per 100 involvements. While a difference of .5 is seemingly insignificant, one must remember that the topic here is human fatalities. In mathematical terms, however, the rate of deaths per 100 involvements was nearly identical between the largest and smallest fleet sizes in 1987.

This above exercise emphasizes the difficulties which can be encountered if the raw information is not fully understood and presented in meaningful terms. ■

COMMERCIAL VESSEL TOTAL LOSSES 1987

25

TABLE 1

| VESSEL TYPE/GTONS | CASUALTY NATURE | | | | | | | TOTAL |
|-----------------------|-----------------|----------------|-----------|-----------|---------------|---------|-------|-------|
| | FOUNDERED | FIRE/EXPLOSION | COLLISION | GROUNDING | HULL/MACH DMG | MISSING | OTHER | |
| FREIGHTSHIP | | | | | | | | |
| SUBTOTAL | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 |
| LT 100 GT | | | | | | | | 0 |
| 100-199 | | | | | | | | 0 |
| 200-299 | | | | | | | 1 | 1 |
| 300-499 | | | | | | | | 0 |
| 500-1599 | | | | | | | | 0 |
| 1600-4999 | | | 1 | | | | | 1 |
| 5000-9999 | | | | | | | | 0 |
| 10,000-19,000 | | | | | | | | 0 |
| GE 20,000 | | | | | | | | 0 |
| PASSENGER SHIP | | | | | | | | |
| SUBTOTAL | 2 | 2 | 0 | 0 | 2 | 0 | 0 | 6 |
| LT 100 GT | 2 | 2 | | | 2 | | | 6 |
| 100-1599 | | | | | | | | 0 |
| 1600-4999 | | | | | | | | 0 |
| GE 5000 | | | | | | | | 0 |
| TUG/TOWBOAT | | | | | | | | |
| SUBTOTAL | 16 | 5 | 0 | 1 | 1 | 0 | 2 | 25 |
| LT 100 GT | 11 | 3 | | | 1 | | 1 | 16 |
| 100-199 | 4 | | | | | | 1 | 5 |
| 200-299 | | 1 | | 1 | | | | 2 |
| 300-999 | 1 | 1 | | | | | | 2 |
| GE 1000 | | | | | | | | 0 |
| TANK BARGE | | | | | | | | |
| SUBTOTAL | 2 | 1 | 2 | 1 | 0 | 0 | 1 | 7 |
| LT 500 GT | | 1 | | | | | | 1 |
| 500-999 | 2 | | | | | | | 2 |
| GE 1000 GT | | | 2 | 1 | | | 1 | 4 |
| MODU | | | | | | | | |
| SUBTOTAL | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 3 |
| LT 300 GT | | | | | | | | 0 |
| GE 300 GT | 1 | | | | 2 | | | 3 |
| PLATFORM | | | | | | | | |
| SUBTOTAL | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| U.S. TOTALS | | | | | | | | |
| | 115 | 39 | 30 | 40 | 15 | 5 | 41 | 285 |

(cont. next col.)

| | | | | | | | | |
|---------------------|---|---|---|---|---|---|---|---|
| FOREIGN FLAG | | | | | | | | |
| SUBTOTAL | 3 | 0 | 1 | 1 | 0 | 0 | 0 | 5 |
| FREIGHT | | | 1 | | | | | 1 |
| TANK | | | | | | | | 0 |
| OTHER | 3 | | | 1 | | | | 4 |

COMMERCIAL VESSEL TOTAL LOSSES 1987

TABLE 2

VESSEL TOTAL LOSSES

| VESSEL TYPE | VESSEL AGE | | | | | | | | | | TOTAL |
|------------------|-------------|----|-------------|----|-------------|----|-------------|----|-------------|--|-------|
| | 0 - 4 YEARS | | 5 - 9 YEARS | | 10-14 YEARS | | 15-19 YEARS | | 20-24 YEARS | | TOTAL |
| | | | | | | | | | | | |
| FREIGHTSHIP | | | 1 | | 1 | | | | | | 2 |
| TANKSHIP | | | | | | 1 | | | | | 1 |
| PASSENGER SHIP | 1 | 2 | | | 1 | 2 | | | | | 6 |
| TUG/TOWBOAT | 1 | 6 | 1 | 6 | 2 | 3 | 6 | | | | 25 |
| OSV* | | | 1 | | 1 | | | | | | 2 |
| MODU** | 1 | 1 | | | 1 | | | | | | 3 |
| PLATFORM | | | | | | 1 | | | | | 1 |
| FISHING VESSEL | 10 | 29 | 28 | 15 | 18 | 7 | 42 | 8 | | | 157 |
| STATE # | 3 | 10 | 2 | 6 | 2 | 10 | 12 | | | | 45 |
| BARGES | | | | | | | | | | | |
| TANK | | 1 | 2 | 1 | 1 | 2 | | | | | 7 |
| FREIGHT | | 2 | 3 | 6 | 2 | 1 | 3 | | | | 17 |
| MISC | 6 | 2 | | 1 | | 1 | 5 | 4 | | | 19 |
| CASUALTY NATURE | | | | | | | | | | | |
| | | | | | | | | | | | |
| FOUNDERS | 6 | 21 | 14 | 15 | 7 | 7 | 33 | 12 | | | 115 |
| FIRE/EXPLOSION | 6 | 6 | 6 | 4 | 3 | 4 | 6 | 4 | | | 39 |
| COLLISION | 7 | 3 | 5 | 3 | 1 | 3 | 4 | 4 | | | 30 |
| GROUNDING | 2 | 8 | 5 | 3 | 7 | 1 | 12 | 2 | | | 40 |
| HULL/MACH DAMAGE | | 5 | 5 | 2 | 2 | 1 | | | | | 15 |
| MISSING | | 1 | 1 | 1 | | | 2 | | | | 5 |
| OTHER | | 8 | 4 | 7 | 7 | 4 | 9 | 2 | | | 41 |
| TOTALS | 21 | 52 | 40 | 35 | 27 | 20 | 66 | 24 | | | 285 |

(D)EATHS AND (I)NJURIES
ASSOCIATED WITH
VESSEL TOTAL LOSSES

| CASUALTY NATURE | | | | | | | | | | | | | |
|--------------------|--|----|---|---|---|---|---|---|---|----|----|----|----|
| FOUNDERED | | | | | | | | | | | | | |
| FIRE/EXPLOSION | | | | | | | | | | | | | |
| COLLISION | | | | | | | | | | | | | |
| GROUNDING | | | | | | | | | | | | | |
| HULL/MACH DMG | | | | | | | | | | | | | |
| MISSING | | | | | | | | | | | | | |
| OTHER | | | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | | | |
| VESSEL TYPE | | D | I | D | I | D | I | D | I | D | I | D | I |
| FREIGHTSHIP | | | | | | | | | | | | 0 | 0 |
| TANKSHIP | | | | | | | | | | | | 0 | 0 |
| PASSENGER SHIP | | 10 | 1 | | 1 | | | | | | | 10 | 2 |
| TUG/TOWBOAT | | | 2 | | 1 | | | | | | | 0 | 3 |
| OSV* | | | | | | | | | | | | 0 | 0 |
| MODU** | | | | | | | | | | | | 0 | 0 |
| PLATFORM | | | | | | | | | | | | 0 | 0 |
| FISHING VESSEL | | 44 | | | 4 | 1 | 2 | 2 | | 11 | | 58 | 6 |
| STATE # | | 7 | 1 | 1 | 1 | 1 | | 1 | | | | 2 | 10 |
| BARGES | | | | | | | | | | | | | |
| TANK | | | | | | | | | | | | 0 | 0 |
| FREIGHT | | | | | | | | | | | | 0 | 0 |
| MISC | | 4 | 2 | 3 | | 4 | 6 | | | 1 | 2 | 1 | 13 |
| | | | | | | | | | | | | | |
| PERSONNEL CATEGORY | | D | I | D | I | D | I | D | I | D | I | D | I |
| LIC OFF | | | | | | | | | | | | 0 | 0 |
| CREW | | 54 | 6 | 1 | 5 | 4 | 5 | 3 | | 1 | 11 | 73 | 20 |
| PASS | | 11 | | | 1 | 2 | 3 | | | 1 | | 14 | 4 |
| OTHER | | | | 3 | 1 | | | | | 1 | | 4 | 1 |
| | | | | | | | | | | | | | |
| TOTALS | | 65 | 6 | 4 | 7 | 6 | 8 | 3 | 0 | 0 | 1 | 91 | 25 |

* OFFSHORE SUPPLY

** MOBILE OFFSHORE DRILLING UNIT

COMMERCIAL VESSEL NON-TOTAL LOSSES 1987

27

TABLE 3

| CASUALTY NATURE | | | | | | | | | CASUALTY NATURE | | | | | | | | |
|-------------------|----|----|-----|-----|-----|---|----|------|-------------------|-----|----|-----|-----|-----|---|-----|------|
| FLOODED | | | | | | | | | FLOODED | | | | | | | | |
| FIRE/EXPLOSION | | | | | | | | | FIRE/EXPLOSION | | | | | | | | |
| COLLISION | | | | | | | | | COLLISION | | | | | | | | |
| GROUNDING | | | | | | | | | GROUNDING | | | | | | | | |
| HULL/MACH DMG | | | | | | | | | HULL/MACH DMG | | | | | | | | |
| WEATHER | | | | | | | | | WEATHER | | | | | | | | |
| OTHER | | | | | | | | | OTHER | | | | | | | | |
| TOTAL | | | | | | | | | TOTAL | | | | | | | | |
| VESSEL TYPE/GTONS | | | | | | | | | VESSEL TYPE/GTONS | | | | | | | | |
| FREIGHTSHIP | | | | | | | | | TANKSHIP | | | | | | | | |
| SUBTOTAL | 3 | 9 | 102 | 103 | 182 | 8 | 14 | 421 | SUBTOTAL | 6 | 14 | 39 | 63 | 94 | 6 | 4 | 226 |
| LT 100 GT | 2 | | 5 | 5 | 3 | | 1 | 16 | LT 100 GT | | 2 | 2 | 1 | 4 | 1 | | 10 |
| 100-199 | | | 1 | 1 | | | | 2 | 100-1599 | 1 | | 2 | 1 | 3 | | | 7 |
| 200-299 | | | 4 | 1 | | | | 5 | 1600-4999 | | 1 | 5 | 3 | | | | 9 |
| 300-499 | | 3 | 2 | 1 | 3 | | | 9 | 5000-9999 | | | 2 | 2 | 1 | | 1 | 6 |
| 500-1599 | | 1 | 6 | 4 | 23 | | 3 | 37 | 10,000-19,999 | | 1 | 7 | 15 | 21 | | | 44 |
| 1600-4999 | | | 3 | 2 | 14 | | | 19 | 20,000-39,999 | 5 | 3 | 12 | 35 | 29 | 2 | 2 | 88 |
| 5000-9999 | | | 12 | 8 | 17 | | | 37 | 40,000-99,999 | | 5 | 8 | 6 | 30 | 3 | 1 | 53 |
| 10,000-19,999 | 1 | 2 | 38 | 45 | 69 | 4 | 5 | 164 | GE 100,000 | | 2 | 1 | | 6 | | | 9 |
| GE 20,000 | | 3 | 31 | 36 | 53 | 4 | 5 | 132 | | | | | | | | | |
| PASSENGER SHIP | | | | | | | | | OFFSHORE SUPPLY | | | | | | | | |
| SUBTOTAL | 12 | 31 | 56 | 55 | 162 | 2 | 14 | 332 | SUBTOTAL | 4 | 3 | 14 | 3 | 10 | 0 | 0 | 34 |
| LT 100 GT | 12 | 23 | 45 | 46 | 94 | 2 | 14 | 236 | LT 100 GT | 1 | 2 | 1 | 2 | 2 | | | 8 |
| 100-1599 | | 5 | 7 | 7 | 40 | | | 59 | 100-199 | | 1 | 5 | | 4 | | | 10 |
| 1600-4999 | | 1 | | 2 | 24 | | | 27 | 200-499 | 3 | | 8 | 1 | 4 | | | 16 |
| GE 5000 | | 2 | 4 | | 4 | | | 10 | GE 500 | | | | | | | | 0 |
| TUG/TOWBOAT | | | | | | | | | FISHING VESSEL | | | | | | | | |
| SUBTOTAL | 27 | 33 | 301 | 560 | 157 | 4 | 92 | 1174 | SUBTOTAL | 155 | 54 | 99 | 121 | 494 | 5 | 167 | 1095 |
| LT 100 GT | 11 | 11 | 71 | 99 | 50 | | 40 | 282 | LT 100 GT | 114 | 32 | 64 | 87 | 333 | 2 | 113 | 745 |
| 100-199 | 11 | 16 | 121 | 130 | 63 | 3 | 28 | 372 | 100-199 | 15 | 10 | 22 | 18 | 64 | 2 | 24 | 155 |
| 200-299 | 2 | 3 | 31 | 56 | 17 | | 9 | 118 | 200-499 | | 1 | | 4 | 1 | | | 6 |
| 300-999 | 3 | 3 | 69 | 246 | 25 | 1 | 14 | 361 | 500-999 | 1 | 2 | 3 | 1 | 1 | | | 8 |
| GE 1000 | | | 9 | 29 | 2 | | 1 | 41 | GE 1000 GT | | 2 | 1 | | 1 | | | 4 |
| TANK BARGE | | | | | | | | | STATE NUMBERED | | | | | | | | |
| SUBTOTAL | 9 | 8 | 133 | 315 | 67 | 2 | 13 | 547 | SUBTOTAL | 25 | 7 | 9 | 11 | 94 | 1 | 30 | 177 |
| LT 100 GT | | 1 | 3 | 1 | 4 | | | 9 | STATE NUMBERED | | | | | | | | |
| 100-499 | | | | | | | | 0 | 100-199 | 8 | 1 | 111 | 516 | 56 | 1 | 92 | 785 |
| 500-999 | 2 | 3 | 26 | 67 | 13 | | 8 | 119 | GE 1000 | 2 | 6 | 45 | 93 | 16 | 1 | 16 | 179 |
| GE 1000 | 7 | 4 | 104 | 247 | 50 | 2 | 5 | 419 | UNKNOWN | 5 | | 25 | 106 | 13 | | 12 | 161 |
| MODU | | | | | | | | | MISCELLANEOUS | | | | | | | | |
| SUBTOTAL | 2 | 1 | 17 | 0 | 5 | 0 | 2 | 27 | SUBTOTAL | 13 | 8 | 71 | 22 | 34 | 3 | 26 | 177 |
| LT 300 GT | | | 4 | | 1 | | 1 | 6 | LT 100 GT | 5 | 3 | 50 | 11 | 5 | 2 | 17 | 93 |
| GE 300 GT | 2 | 1 | 13 | | 4 | | 1 | 21 | GE 100 GT (SP) | 4 | 3 | 8 | 6 | 23 | | | 44 |
| PLATFORM | | | | | | | | | GE 100 GT (NSP) | | | | | | | | |
| SUBTOTAL | 1 | 7 | | | 1 | | | 9 | GE 100 GT (NSP) | 4 | 2 | 13 | 5 | 6 | 1 | 9 | 40 |
| U.S. TOTALS | | | | | | | | | U.S. TOTALS | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

FOREIGN FLAG

| | | | | | | | |
|-----------------|-----------|-----------|-----------|-----------|----------|-----------|------------|
| SUBTOTAL | 12 | 93 | 84 | 93 | 1 | 12 | 295 |
| FREIGHT | 4 | 55 | 57 | 69 | | 8 | 193 |
| TANK | 3 | 24 | 22 | 15 | | 3 | 67 |
| OTHER | 5 | 14 | 5 | 9 | 1 | 1 | 35 |

COMMERCIAL VESSEL NON-TOTAL LOSSES 1987

TABLE 4

NON-TOTAL VESSEL LOSSES

VESSEL AGE

0 - 4 YEARS

5 - 9 YEARS

10-14 YEARS

15-19 YEARS

20-24 YEARS

25-29 YEARS

30 + YEARS

UNKNOWN

TOTAL

| VESSEL TYPE | 0 - 4 YEARS | | 5 - 9 YEARS | | 10-14 YEARS | | 15-19 YEARS | | 20-24 YEARS | | 25-29 YEARS | | 30 + YEARS | | UNKNOWN | | TOTAL |
|-------------|-------------|-----|-------------|-----|-------------|----|-------------|-----|-------------|--|-------------|--|------------|--|---------|--|-------|
| FREIGHTSHIP | 63 | 106 | 97 | 70 | 26 | 8 | 42 | 9 | 421 | | | | | | | | 421 |
| TANKSHIP | 25 | 45 | 69 | 35 | 14 | 16 | 19 | 3 | 226 | | | | | | | | 226 |
| PASSENGER | 52 | 67 | 52 | 45 | 38 | 22 | 55 | 1 | 332 | | | | | | | | 332 |
| TUG/TOWBOAT | 30 | 292 | 284 | 141 | 117 | 62 | 218 | 30 | 1174 | | | | | | | | 1174 |
| OSV* | 5 | 13 | 11 | 2 | 2 | | 1 | 1 | 34 | | | | | | | | 34 |
| MODU** | 3 | 18 | 4 | | 1 | | 1 | 1 | 27 | | | | | | | | 27 |
| PLATFORM | | 1 | | | | | | 8 | 9 | | | | | | | | 9 |
| FISHING | 50 | 194 | 133 | 119 | 84 | 24 | 273 | 41 | 918 | | | | | | | | 918 |
| STATE # | 17 | 22 | 34 | 22 | 16 | 11 | 43 | 12 | 177 | | | | | | | | 177 |
| BARGES | | | | | | | | | | | | | | | | | |
| TANK | 8 | 101 | 137 | 139 | 78 | 25 | 30 | 29 | 547 | | | | | | | | 547 |
| FREIGHT | 36 | 358 | 221 | 172 | 86 | 19 | 20 | 217 | 1129 | | | | | | | | 1129 |
| MISC | 18 | 31 | 21 | 16 | 18 | 12 | 24 | 37 | 177 | | | | | | | | 177 |

| CASUALTY NATURE | | | | | | | | | | | | | | | | | TOTAL |
|-----------------|----|-----|-----|-----|-----|----|-----|-----|------|--|--|--|--|--|--|--|-------|
| FOUNDERED | 13 | 47 | 40 | 32 | 31 | 16 | 51 | 16 | 246 | | | | | | | | 246 |
| FIRE/EXPLOSION | 16 | 39 | 33 | 28 | 14 | 7 | 31 | 1 | 169 | | | | | | | | 169 |
| COLLISION | 60 | 272 | 226 | 127 | 100 | 43 | 101 | 93 | 1022 | | | | | | | | 1022 |
| GROUNDING | 96 | 530 | 435 | 302 | 179 | 60 | 179 | 177 | 1958 | | | | | | | | 1958 |
| HULL/MACH | 98 | 268 | 243 | 200 | 109 | 53 | 269 | 52 | 1292 | | | | | | | | 1292 |
| OTHER | 24 | 92 | 86 | 72 | 47 | 20 | 93 | 50 | 484 | | | | | | | | 484 |

TOTALS 307 1248 1063 761 480 199 724 389 5171

(D)EATHS AND (I)NJURIES ASSOCIATED WITH VESSEL NON-TOTAL LOSSES

CASUALTY NATURE

FOUNDERED

FIRE/EXPLOSION

COLLISION

GROUNDING

HULL/MACH DMG

MISSING

OTHER

TOTAL

| VESSEL TYPE | FOUNDERED | | FIRE/EXPLOSION | | COLLISION | | GROUNDING | | HULL/MACH DMG | | MISSING | | OTHER | | TOTAL | |
|-------------|-----------|----|----------------|----|-----------|---|-----------|----|---------------|--|---------|--|-------|----|-------|---|
| FREIGHTSHIP | | | | | 4 | | | 4 | | | | | 2 | 0 | 10 | |
| TANKSHIP | | | 7 | | | | 1 | 8 | | | | | | 0 | 16 | |
| PASSENGER | | 1 | 9 | 1 | 148 | 6 | 5 | | | | | | | 2 | 168 | |
| TUG/TOWBOAT | | 1 | 4 | | 5 | 1 | 1 | 1 | 10 | | | | 2 | 3 | 22 | |
| OSV* | | | | | | | | 1 | | | | | | 1 | 0 | |
| MODU** | 2 | 15 | | 1 | | | | | | | | | | 18 | 0 | |
| PLATFORM | | | | | | | | | | | | | | 0 | 0 | |
| FISHING | 3 | | 10 | 2 | | | 1 | 4 | | | | | 2 | 8 | 14 | |
| STATE # | | | | 1 | 2 | | | | | | | | 3 | 6 | 4 | 8 |
| BARGES | | | | | | | | | | | | | | | | |
| TANK | | | 3 | | | | 1 | 16 | | | | | | 0 | 20 | |
| FREIGHT | | | | | | | | | | | | | | 0 | 0 | |
| MISC | 6 | 3 | 8 | 16 | 27 | 2 | | 35 | | | | | 8 | 27 | 78 | |

| PERSONNEL CATEGORY | | | | | | | | | | | | | | | | |
|--------------------|----|---|----|----|----|-----|---|---|---|----|---|---|----|----|-----|---|
| LIC OFF | | | 3 | 1 | | | | | 1 | 6 | | 1 | | | 4 | 8 |
| CREW | 11 | 6 | 2 | 31 | 15 | 37 | 3 | 5 | 2 | 67 | 1 | 5 | 13 | 38 | 154 | |
| PASS | | | | 8 | 5 | 145 | | 4 | | 4 | 1 | | 5 | 5 | 164 | |
| OTHER | | | 15 | 1 | 1 | 4 | | | | 5 | | | | 16 | 10 | |

TOTALS 11 0 20 41 21 186 3 9 3 82 0 0 5 18 63 336

* OFFSHORE SUPPLY

** MOBILE OFFSHORE DRILLING UNIT

COMMERCIAL VESSEL NON-CASUALTY-RELATED DEATHS AND INJURIES 1987

TABLE 5

| CASUAL NATURE | VESSEL SERVICE | | | | | | | | | | | TOTAL | PERSONNEL CATEGORY | | | | TOTAL |
|------------------|----------------|----------|----------------|-------------|-----------------|----------------|--------------------------|--------------------|---------------|----|--|-------|------------------------|------------|--------|--|-------|
| | FREIGHTSHIP | TANKSHIP | PASSENGER SHIP | TUG/TOWBOAT | OFFSHORE SUPPLY | FISHING VESSEL | MOBILE DRILLING PLATFORM | FREIGHT/TANK BARGE | MISCELLANEOUS | | | | CREW (INCL. LIC. OFF.) | PASSENGERS | OTHERS | | |
| DEATHS | | | | | | | | | | | | | | | | | |
| SLIP/FALL | 8 | | | | | | 3 | 1 | 1 | | | 13 | 12 | | 1 | | 13 |
| OVERBOARD | 3 | 3 | 5 | 7 | | 5 | | 1 | 1 | 2 | | 27 | 22 | 3 | 2 | | 27 |
| DISAPPEAR | 4 | 1 | 1 | 2 | | 9 | | | | | | 17 | 15 | 1 | 1 | | 17 |
| STRUCK BY OBJ | 1 | 1 | | | | 1 | 1 | | | 3 | | 7 | 7 | | | | 7 |
| PINCH/CRUSH | 1 | | | 1 | | 1 | | | | 2 | | 5 | 5 | | | | 5 |
| BURN/SCALD | | | | | | | | | | | | 0 | | | | | 0 |
| ELEC SHOCK | 1 | | | | | 1 | | | | | | 2 | 2 | | | | 2 |
| CUT | | | | | | | | | | 1 | | 1 | 1 | | | | 1 |
| ENTANGLED | | | | | | 1 | | | | | | 1 | 1 | | | | 1 |
| ASPHXA | 1 | | | | | 4 | 3 | | | 1 | | 9 | 8 | | 1 | | 9 |
| SPRAIN/STRAIN | | | | | | | | | | | | 0 | | | | | 0 |
| DIVING | | | 10 | | 1 | 4 | | | | 2 | | 17 | 3 | 12 | 2 | | 17 |
| UNK/NOC | 1 | 2 | | 1 | | 3 | | | | | | 7 | 6 | | 1 | | 7 |
| TOTALS | 20 | 7 | 16 | 11 | 1 | 29 | 7 | 2 | 2 | 11 | | 106 | 82 | 16 | 8 | | 106 |
| INJURIES | | | | | | | | | | | | | | | | | |
| SLIP/FALL | 65 | 39 | 46 | 17 | 20 | 13 | 55 | 97 | 4 | 15 | | 371 | 334 | 25 | 12 | | 371 |
| OVERBOARD | | | | 1 | 1 | | | | | | | 2 | 1 | | 1 | | 2 |
| DISAPPEAR | | | | | | | | | | | | 0 | | | | | 0 |
| STRUCK BY OBJ | 24 | 14 | 11 | 7 | 14 | 22 | 30 | 44 | 1 | 8 | | 175 | 164 | 2 | 9 | | 175 |
| PINCH/CRUSH | 20 | 7 | 7 | 4 | 5 | 6 | 27 | 24 | | 4 | | 104 | 98 | 3 | 3 | | 104 |
| BURN/SCALD | 5 | 7 | | 1 | 1 | | 2 | 8 | | 3 | | 27 | 27 | | | | 27 |
| ELEC SHOCK | 2 | | | | | | 1 | 2 | | | | 5 | 5 | | | | 5 |
| CUT | 1 | 1 | | | | 1 | | 1 | | | | 4 | 4 | | | | 4 |
| ENTANGLED | 1 | | | 1 | | 10 | 1 | 1 | | | | 14 | 13 | 1 | | | 14 |
| ASPHXA | | | | | | | | | | | | 0 | | | | | 0 |
| SPRAIN/STRAIN | 3 | 2 | 1 | | | | 5 | 6 | | | | 17 | 17 | | | | 17 |
| DIVING | | | 3 | | | 1 | | | | 1 | | 5 | 1 | 4 | | | 5 |
| UNK/NOC | 5 | 3 | | | | | 1 | 3 | | 1 | | 13 | 12 | | 1 | | 13 |
| TOTALS | 126 | 73 | 68 | 31 | 41 | 53 | 122 | 186 | 5 | 32 | | 737 | 676 | 35 | 26 | | 737 |

COMMERCIAL VESSEL CASUALTY SUMMARY 1987

TABLE 6

| CASUALTY CAUSE | CASUALTY NATURE | | | | | | | |
|-------------------|--|----|-----|-----|-----|---|----|------|
| | FOUNDERED | | | | | | | |
| | FIRE/EXPLOSION | | | | | | | |
| | COLLISION | | | | | | | |
| | GROUNDING | | | | | | | |
| | HULL/MACH DMG MISSING OTHER TOTAL | | | | | | | |
| PERSONNEL | 58 | 40 | 368 | 639 | 172 | 0 | 79 | 1356 |
| SUBTOTAL | 58 | 40 | 368 | 639 | 172 | 0 | 79 | 1356 |
| INATT. TO DUTY | 2 | 2 | 25 | 25 | 1 | | 4 | 59 |
| ERROR JUDGEMENT | 2 | | 95 | 206 | | | 5 | 308 |
| CARELESSNESS | 5 | 10 | 8 | 3 | 4 | | 8 | 38 |
| LACK KNOWLEDGE | | | 1 | 11 | 1 | | | 13 |
| FAILED TO: | | | | | | | | |
| ACCT WIND/CRNT | 1 | | 20 | 35 | | | | 56 |
| USE NAV EQUIP | | | 1 | 2 | | | | 3 |
| USE RADIO | 1 | | 2 | | | | | 3 |
| DETERMINE POSN | 2 | | 16 | 65 | | | | 83 |
| SET PASS AGREE | | | 7 | 2 | | | | 9 |
| KEEP LOOKOUT | | 1 | 20 | 3 | | | 2 | 26 |
| COMPLY RULE/REG | | | 16 | 3 | | | | 19 |
| PROC. SAFE SPEED | | | 5 | 3 | | | | 8 |
| YIELD RT OF WAY | | | 5 | | | | | 5 |
| STRESS | | | | | | | | 0 |
| FATIGUE | | | 1 | 1 | | | | 2 |
| PHYSIOLOGICAL | | | | 1 | | | | 1 |
| INTOXICATION | | | | | | | 1 | 1 |
| IMPROP LOADING | 7 | | 1 | 2 | 4 | | 2 | 16 |
| IMPROP MAINT | 10 | 9 | | | | | 16 | 157 |
| IMPROP MOORING | 10 | 1 | 9 | 5 | 2 | | 11 | 38 |
| IMPROP RIGGING | 1 | | | 1 | | | 1 | 3 |
| IMPROP SAFETY | 2 | 10 | 3 | 6 | 6 | | 6 | 33 |
| OPERATOR ERROR | 2 | 1 | 125 | 236 | 12 | | 10 | 407 |
| OTHER | 7 | 6 | 8 | 29 | 14 | | 4 | 68 |
| ENVIRONMENT | | | | | | | | |
| SUBTOTAL | 35 | 1 | 58 | 222 | 63 | 1 | 41 | 421 |
| ADVERSE WEATHER | 13 | | 19 | 14 | 6 | 1 | 22 | 75 |
| ADVERSE CURRENT | 13 | | 8 | 10 | 1 | | 10 | 42 |
| DEBRIS | | | 1 | | 38 | | | 39 |
| ICE | | | | 1 | | | | 0 |
| LIGHTNING | | | | | | | | 0 |
| SHOALING | | | | 157 | | | | 157 |
| SUBMGD OBJECT | 8 | | 7 | 12 | 17 | 0 | 6 | 50 |
| CHANNEL HAZARD | | | | | | | | |
| INADEQUATE ATON | 1 | | 11 | 4 | | | | 16 |
| OTHER | | | | | | | | 0 |
| (cont. next col.) | | | | | | | | |

| CASUALTY CAUSE | CASUALTY NATURE | | | | | | | |
|--------------------|--|-----|-----|-----|------|---|-----|------|
| | FOUNDERED | | | | | | | |
| | FIRE/EXPLOSION | | | | | | | |
| | COLLISION | | | | | | | |
| | GROUNDING | | | | | | | |
| | HULL/MACH DMG MISSING OTHER TOTAL | | | | | | | |
| MATERIAL | 72 | 101 | 40 | 50 | 783 | 0 | 308 | 1354 |
| SUBTOTAL | 72 | 101 | 40 | 50 | 783 | 0 | 308 | 1354 |
| FAILED MATERIAL: | | | | | | | | 0 |
| STRUCTURAL | 53 | 28 | 10 | 17 | 101 | | 151 | 360 |
| MECHANICAL | 2 | 34 | 8 | 3 | 459 | | 43 | 549 |
| ELECTRICAL | 2 | 36 | 1 | | 130 | | 17 | 186 |
| CORROSION | | | | | 9 | | 2 | 11 |
| NORMAL WEAR | | 1 | | | 7 | | | 8 |
| IMPROPER WELDING | | 1 | | | 3 | | | 4 |
| IMPROPER RIVETING | | | | | | | | 0 |
| STEERING FAILURE | 2 | | 11 | 12 | 1 | | 8 | 34 |
| FOULED PROPELLER | 2 | | 2 | 1 | 28 | | 47 | 80 |
| INADEQUATE: | | | | | | | | 0 |
| LIGHTING | | | 1 | 0 | 1 | 0 | 2 | 4 |
| STABILITY | 9 | | | | 1 | | 2 | 12 |
| LIFESAVING EQUIP | | | | | | | | 0 |
| FIREFIGHTING EQUIP | | | | | | | | 0 |
| CONTROLS | | | | | | | | 0 |
| LUBRICATION | | | | | 3 | | | 3 |
| MAINTENANCE | | | | | | | | 0 |
| INSUFFICIENT FUEL | | | | | 6 | | 3 | 9 |
| PROPULSION FAIL | | | 4 | 1 | 20 | | 32 | 57 |
| FATIGUE FAILURE | | | | | 10 | | | 10 |
| OTHER | 2 | 1 | 3 | 16 | 4 | | 1 | 27 |
| TOTALS | 165 | 142 | 466 | 911 | 1017 | 1 | 426 | 3128 |

Chemical of the Month

Rocklyn McNair

Ethylene

Ethylene is the sixth highest-volume chemical produced in the United States and third in the world. It is often called ethene, etherin, and olefinat gas. It usually exists in the gaseous phase and has a slightly sweet smell. It is a colorless gas at room temperature, can be compressed, and can float on water.

Ethylene is presently produced by two pyrolysis techniques. The first is the dehydration of ethyl alcohols, and the second is through thermal cracking. Thermal cracking is the decomposition, combination, or rearrangement of hydrocarbon molecules by the application of heat to petroleum products, without the use of catalysts. A third way to produce ethylene, by flame cracking, is presently being tested in an advanced cracking reactor (ACR) by applying heat in excess of 2,000o Celsius to a mixture of crude oil and high-temperature gases. If flame cracking can be perfected, greater volumes of ethylene can be produced at once.

Ethylene has few uses of its own. In nature, ethylene is what causes fruit to ripen. It can be used in welding and cutting metals, as a refrigerant, an anesthetic, and in agriculture to quicken the ripening process. However, it is chiefly used as a starting material in the production of polyethylene, polypropylene, dichlorides, glycols, aluminum alkyls, and acetates.

The chemical is highly flammable and can explode in enclosed areas (under high pressures). It reacts vigorously with oxidizing materials. It should be kept away from static electricity, oxygen, and long exposure to sunlight. It can be transported safely in tube trailers and ocean tankers. It stays 99- to 100-percent pure. It must be kept below 103o centigrade to remain in its liquid phase. If it ignites, the source of ethylene

should be shut off immediately. Water can be used to disperse the vapors and cool heated objects within the fire, while dry chemical foam and/or carbon dioxide must be used to put out the fire.

Ethylene is a simple asphyxiant, meaning that if it is inhaled, it will replace the oxygen in one's lungs and thus cut off the oxygen supply to the organs. High concentrations of ethylene can cause narcosis and unconsciousness. In its liquid phase, it can cause frostbite. To treat someone who has inhaled the gas, take the victim to a place with plenty of fresh air, apply mouth to mouth resuscitation if necessary, and/or use a self-contained breathing apparatus.

The Coast Guard regulates ethylene under Subchapter O of 46 CFR. Under IMO, ethylene is classed as a flammable gas (2.1) in the IMDG Code.

Chemical Name: ethylene

Formula: C₂H₄

Synonyms

Ch₂Ch₂, ethene, elayl, etherin

Physical Properties

boiling point: -103.9oC

freezing point: -169oC

vapor pressure at

-84oC (-120oF): 40.160 psi

-73oC (-100oF): 65.099 psi

Flammability Limits

lower: 2.75%

upper: 36%

Combustion Properties

flashpoint (c.c.): -136oC

autoignition: 543oC

Densities

vapor (air = 1): 0.978

specific gravity (at 0oC): 0.610

density (at -106.7oC): 35.81 lb/ft³

U.N. Number:

1962 (comp.)

1038 (liquid)

CHRIS Code: ETL

Cargo Compatibility Group: 30 (Olefins)

Fourth-Class Cadet Rocklyn McNair wrote this article for LT Thomas Chuba's "Special Projects in Chemistry" class at the Coast Guard Academy.

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:

Engineer

1. Upon failure of the normal power supply, the emergency generator is placed on the line by the _____.

- A. bus tie feeder
- B. automatic bus transfer device
- C. line connection feeder
- D. power failure alarm bus

Reference: MEBA, *Relief Engineer*

2. During the power stroke, the side thrust of a trunk-type piston is a result of the angle _____.

- A. formed by the connecting rod and the cylinder center line
- B. formed by the piston in relation to the piston pin
- C. between the crankarm and crankpin
- D. between the master and link connecting rods

Reference: Stinson, *Diesel Engineering Handbook*

3. On tankers with manually operated tank valves, the deck hand wheel indicator registers the _____.

- A. lift of the tank valve disk
- B. oxygen content of the tank
- C. approximate number of turns the tank valve has been opened
- D. level of oil in the tank

Reference: Marton, *Tanker Operations*

4. Which statement is true concerning the design of balanced throttle valves?

- A. They utilize a conventional valve disc and a balance piston.
- B. They utilize two parallel seats and a balance cylinder.
- C. The valve has a positive opening tendency at all times.
- D. The piston is secured below the valve disc to prevent movement.

Reference: Osbourne, *Modern Marine Engineer's Manual, Vol. I*

5. How many approved fire extinguishers must be carried in the machinery space of a 3000 BHP vessel?

Reference: 46 CFR 25.30-20

Deck

1. The sea painter is secured in the lifeboat by _____.

- A. a turn around a forward thwart and held with a toggle pin
- B. a knot around a thwart
- C. an eye splice placed over one of the hooks of the releasing gear
- D. any of the above methods is satisfactory

Reference: Hayler, *American Merchant Seaman's Manual*

2. You are on a cargo vessel carrying toluol in bulk in portable tanks. Which of the following is a requirements for pumping the toluol?

- A. Hose connections to the tank must be made with a minimum of three bolts.
- B. There must be water pressure on the firemain.
- C. You must shut down if another vessel comes alongside.
- D. If transferring at anchor, you must display a red flag by day and a red light at night.

Reference: 46 CFR 98.30-37

3. A partial deck in the hold is called the _____.

- A. weather deck
- B. orlop deck
- C. shelter deck
- D. main deck

Reference: Baker, *Introduction to Steel Shipbuilding*

4. When heading on a course, you put your rudder hard over. The distance traveled parallel to the direction of the original course from where you put your rudder over to any point on the turning circle is known as _____.

- A. advance
- B. head reach
- C. tactical diameter
- D. transfer

Reference: Knight, *Modern Seamanship*

5. A time diagram is a diagram on the plane of the _____.

- A. celestial meridian
- B. celestial equator
- C. celestial horizon
- D. principal vertical circle

Reference: Bowditch, *American Practical Navigator, Vol. I*

Answers

Engineer

1-B; 2-A; 3-C; 4-A; 5-C

Deck

1-A; 2-B; 3-B; 4-A; 5-B

If you have any questions concerning "Nautical Queries," please contact U.S. Coast Guard (G-MVP-5), 2100 Second St., SW, Washington, DC 20593-0001; telephone (202) 267-2705. ■

Keynotes

Final Rule

CGD 77-140, Vessel Piping Systems (October 2)

These regulations amend the vessel piping systems regulations to clarify technical requirements, correct errors, and revise the lists of acceptable standards and specifications. These changes result from advances in technology and suggestions from industry and Coast Guard field units and provide a better understanding of the technical requirements for vessel piping systems. In addition, these amendments delete the manufacturers' affidavit system used to verify compliance of various piping components with the regulations and, instead, incorporate industry developed standards. These changes eliminate the submission of technical information for these components and reduce the overall cost burden in staff hours and paperwork for both industry and the government, while providing a better method for ensuring that the components comply with Coast Guard regulations.

This rule is effective on November 1, 1989. The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of November 1, 1989.

For further information, contact LCDR Peter Richardson, Office of Marine Safety, Security and Environmental Protection, Marine Technical and Hazardous Materials Division, (202) 267-2206.

CGD 88-018, United States Aids to Navigation System (November 24)

The Coast Guard has completed conversion of all federal aids in the U.S. Aids to Navigation System to harmonize with the IALA Maritime Buoyage System. This rule makes minor editorial changes and removes the parenthetical reference to the pre-IALA marking system now that the conversion is complete.

The effective date is December 26, 1989. For further information, contact LTJG J.B.

Favero, Office of Navigation Safety and Waterway Services, (202) 267-1973.

CGD 88-033, Appeal Procedures and Coast Guard Organization (December 6)

This rule establishes a uniform appeals section to replace all existing appeals sections in 46 CFR chapter I, except for subpart J of part 5 which deals with suspension and revocation hearings. All existing appeals sections in 46 CFR chapter I are amended to reference the uniform appeals section in part 1. A similar reference is added to some parts in chapter I which do not currently address appeal procedures. This rule also updates the Coast Guard organization contained in part 1. The current procedure for appealing a Coast Guard requirement is confusing because existing appeals sections vary in wording and do not contain complete guidance necessary for making an appeal. Certain aspects of the Coast Guard organization contained in part 1 are not correct. This rule will clarify the appeal process, eliminate repetitive sections and update the Coast Guard organization.

The effective date is December 6, 1989. For further information, contact LT Michael Raber, Office of Marine Safety, Security and Environmental Protection, Marine Technical and Hazardous Materials Division, (202) 267-2997.

Proposed Rule

CGD 88-102, Marine Vapor Control Systems (October 6)

The Coast Guard proposes to adopt new regulations for the safe design installation, and operation of marine vapor control systems. Some states, in an attempt to meet the national ambient air quality standard for ozone set by the EPA under the Clean Air Act, have issued requirements for the control of volatile organic compound (VOC) emissions from tank vessels which carry oil and chemicals in bulk. Vapor emission control is also being considered as a means of reducing occupational exposure to toxic chemicals such as benzene. Unsafe vapor control system design or operation could result in fires and explosions, tank ruptures, and oil spills. This rulemaking will not require the installation or use of vapor control systems.

The closing date for submitting comments was November 20, 1989. For further information, contact LCDR Robert H. Fitch, Office of Marine Safety, Security and Environmental Protection, (202) 267-1217.

Interim Final Rule

CGD 89-008, Documentation of Vessels, Recordation of Instruments (October 12)

The Coast Guard is issuing this final rule to amend its vessel documentation regulations to implement a newly enacted statute which codifies and amends the Ship Mortgage Act of 1920. The new legislation made substantive changes to the laws governing the recordation of instruments. The Coast Guard's existing regulations are at variance with some of those changes, and therefore must be amended to implement legislative intent. The intended effect of this rulemaking is to conform the Coast Guard's regulations to those aspects of the new statute which are considered unequivocal and are currently effective, and to provide for uniform application of the law by the Coast Guard's Vessel Documentation Offices.

This interim final rule became effective on October 12, 1989. For further information, contact Mr. Thomas Willis, Office of Marine Safety, Security and Environmental Protection, (202) 267-1492.

CGD 78-174b, Approval of Inflatable Lifejackets (December 5)

This interim final rule establishes structural and performance standards and procedures for approval of inflatable lifejackets, as well as requirements for associated manuals, servicing programs, and shore-side service facilities. Inflatable lifejackets need only minimal stowage space and are well suited for use on vessels that have stowage space and weight limitations. Inflatable lifejackets are allowed only on certain inspected vessels and submersibles and must be serviced annually at approved servicing facilities. Their use is optional but, if carried, certain limitations apply.

This rule becomes effective on January 4, 1990. The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of January 4, 1990.

Comments were due on January 19. For further information, contact Mr. Samuel Wehr, Office of Marine Safety, Security and Environmental Protection, (202) 267-1444.

CGD 85-061, Intervals for Required Internal Examination and Hydrostatic Testing of Pressure Vessel Type Cargo Tanks on Barges (December 11)

The Coast Guard is amending the regulations that govern internal inspection and hydrostatic test intervals for pressure vessel cargo tanks on barges that transport liquefied gaseous cargoes and Grade A flammable liquids. This rulemaking was initiated following industry requests that the Coast Guard review and amend existing inspection requirements. These amendments will reduce industry's compliance costs due to the lengthening of inspection intervals. The present level of safety is maintained by these amendments through the use of more sophisticated examination technologies.

This Interim Final Rule is effective on January 10, 1990. The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of January 10, 1990. Comments on the amendments to the examination intervals for chlorine tanks, discussed in preamble paragraph 11, must be received before March 12, 1990.

Comments on the modifications to the examination intervals for chlorine tanks (see section 151.05-31(p)), discussed in preamble paragraph 11, should be submitted to Executive Secretary, Marine Safety Council (G-LRA-2) (CGD 85-061), 2100 Second St., SW, Washington, DC 20593-0001. For further information, contact CDR John Hersh, Office of Marine Safety, Security and Environmental Protection, (202) 267-1181.

Interim Final Rule; Correction

CGD 88-100, Bulk Hazardous Materials; Correction (October 26)

In the interim final rule concerning bulk hazardous materials which was published on September 29, 1989 (54 FR 40005) a paragraph appearing in the previously existing regulation

was inadvertently omitted. This paragraph is added without change.

On page 40056, in the first column, following the heading of Table 2 in part 153, correct the table to add the following introductory paragraph to read as follows:

¶ 153.1608 [Table 2 amended]

"The cargoes listed in this table are not regulated under subchapter D or O of this title when carried in bulk on non-oceangoing barges. Category A, B, or C noxious liquid substance (NLS) cargo, as defined in § 153.2 of this chapter, listed in this table, or any mixture containing one or more of these cargoes, must be carried under this subchapter if carried in bulk on an oceangoing ship. Requirements for Category D NLS cargoes and mixtures of non-NLS cargoes with Category D NLS cargoes are in 33 CFR part 151."

For further information, contact Mr. Curtis Payne, Office of Marine Safety, Security and Environmental Protection, (202) 267-1577.

Supplemental Notice of Proposed Rulemaking

CGD 88-031, Documentation of Vessels; Controlling Interest (October 13)

The Coast Guard published a notice of proposed rulemaking on October 20, 1988 (53 FR 41211), proposing to amend the vessel documentation regulations to implement the American control provisions of the Commercial Fishing Industry Vessel Anti-Reflagging Act of 1987 (the "Anti-Reflagging Act"). The rulemaking also proposed to conform controlling interest requirements for partnerships to the Anti-Reflagging Act's requirements for corporations. Based on comments received in response to the notice of proposed rulemaking, and the Coast Guard's own administrative experience, the Coast Guard has determined that a complete revision of the regulations concerning citizenship requirements for vessel documentation is needed. This supplemental notice of proposed rulemaking proposes to revise these citizenship regulations, which set out the standards for determining what foreign participation in the control of vessel owning entities will disqualify those entities from documenting a vessel under U.S. law, or result in

the loss of eligibility to obtain a coastwise or fishery license endorsement. The proposed revisions will result in regulations that are more informative and uniform.

The closing date for comments was December 12, 1989. For further information, contact LCDR Robert Bruce, Office of Marine Safety, Security and Environmental Protection, (202) 267-1492.

CGD 79-116 and 79-116a, Tankerman Requirements and Qualifications for Persons-in-Charge of Dangerous Liquid and Liquefied Gas Transfer Operations (October 17)

The Coast Guard is proposing to issue regulations governing the qualifications of personnel in charge of and assisting in the handling, transfer, and transportation of oil and hazardous liquid cargoes in bulk aboard vessels. Human error and lack of awareness of the hazards involved on the part of personnel engaged in these operations have resulted in a number of well-publicized marine casualties. Having better qualified personnel participating in these operations should lead to a reduction in tank vessel casualties.

Comments were due on January 16, 1990. For further information, contact Mr. Jim Cratty, Office of Marine Safety, Security and Environmental Protection, (202) 267-0224.

CGD 81-023, Equipment Requirement for Recreational Boats; Personal Flotation Devices (November 20)

A pamphlet containing information about the selection, use and care of personal flotation devices (PFDs) is required to be packaged with each new PFD sold or offered for sale. The requirements for PFD pamphlets need to be revised and updated. The Coast Guard proposes to incorporate by reference the PFD pamphlet design and packaging requirements in Underwriters Laboratories Standard for Marine Buoyant Devices (UL 1123). This rulemaking will result in improved PFD pamphlets which will increase boater awareness and use of PFDs. The Coast Guard also proposes to revise other PFD related sections to reflect approval of special purpose Type V PFDs and to remove an obsolete exemption from PFD carriage requirements.

Comments must be submitted on or before February 20, 1990. Comments may be mailed to

Executive Secretary, Marine Safety Council (G-LRA-2) (CGD 81-023), 2100 Second St., SW, Washington, DC 20593-0001. A copy of UL 1123 PFD Pamphlet requirements and an example of a type III PFD pamphlet may be obtained by sending a self-addressed 8-1/2 x 11 envelope with postage paid for 4 ounces to Commandant (G-NAB/12), U.S. Coast Guard, 2100 Second St., SW, Washington, DC 20593-0001, or by calling (202) 267-1077 for a copy of the example pamphlet only. For further information, contact Mr. Carlton Perry, Office of Navigation Safety and Waterway Services, at the number above.

Notice

CGD 89-079, Omega Validation of the Indian Ocean (October 31)

Notice is hereby given that the U.S. Coast Guard has completed a validation study of the Omega Radionavigation System coverage in the Indian Ocean. The study shows that the measured Omega system performance generally conforms to theoretical expectations and that the system provides continuous, all-weather navigation coverage, with typical position fixing accuracy of 2 nautical miles, 95% of the time. The study also provides information about anomalies and model interference patterns in the region. The report of the study's finding is available through the National Technical Information Service, Springfield, Virginia 22161. The report is identified by Government Accession Number AD-A194458.

Notice of Proposed Rulemaking

CGD 88-057, Automatic Auxiliary Boilers (November 13)

The Coast Guard proposes to revise the requirements for automatic auxiliary boilers contained in 46 CFR part 63. The scope and applicability of part 63 will be clarified to minimize confusion, and industry consensus standards will replace existing regulations where these standards provide an equivalent level of safety when compared with the existing requirements. Also, a specific safety provision will be added to reduce the possibility of an explosion during the postpurge cycle. The end result of implementing this proposed rulemaking will be a reduction in costs and time delays for

the approval process without compromising safety.

Comments must be submitted on or before February 12, 1990. Comments may be mailed to Executive Secretary, Marine Safety Council (G-LRA-2) (CGD 88-057), 2100 Second St., SW, Washington, DC 20593-0001. For further information, contact Mr. Randall Crenwelge, Office of Marine Safety, Security and Environmental Protection, (202) 267-2206.

CGD 84-068, Personal Flotation Device (PFD) Components (November 13)

This notice proposes procedures for obtaining Coast Guard acceptance of non-standard components, self-certification requirements for standards components, and production quality control requirements for all components used in the manufacture of Coast Guard approved personal flotation devices (PFDs). This notice also proposes to prohibit the use of cotton thread as a PFD component, designate specified nylon and polyester threads as standard components, and add new performance requirements for non-standard thread. Industry-wide conversion to the use of non-standard PFD components made of synthetic materials has caused a substantial backlog in Coast Guard review and acceptance of non-standard components. Also, a significant number of failures of non-standard components have been observed in random production testing. The purpose of these rules, as proposed, would be to reduce the time and effort involved to obtain Coast Guard acceptance of non-standard PFD components, and to reduce the number of failures observed in random testing of these components. The proposed regulations in this NPRM relating to standard PFD components and to certain non-standard PFD components essentially represent a codification of longstanding procedures and requirements that are currently applied to those components.

Comments must be submitted on or before January 12, 1990. Comments may be mailed to Executive Secretary, Marine Safety Council (G-LRA-2) (CGD 84-068), 2100 Second St., SW, Washington, DC 20593-0001. For further information, contact Mr. Kurt Heinz, Office of Marine Safety, Security and Environmental Protection, (202) 267-1444.

Advance Notice of Proposed Rulemaking; Reporting of the Comment Period

CGD 87-094, Dry Cargo Ship Subdivision and Damage Stability Regulations (November 6)

On April 6, 1988, the Coast Guard published an advance notice of proposed rulemaking (ANPRM) in the Federal Register (53 FR 11440) advising the public that the Coast Guard was considering regulations to require new, oceangoing, foreign and domestic cargo ships greater than 330 feet (100 meters) in length and of 500 gross tons or over entering U.S. ports to meet a minimum standard of subdivision and damage stability. Draft regulations were included as an appendix, and public comment was solicited. Since the publication of the ANPRM, the Maritime Safety Committee (MSC) of the International Maritime Organization (IMO), revised the draft standard proposed by the IMO Subcommittee on Stability and Load Lines and on Fishing Vessel Safety (SLF), which was the basis for the Coast Guard's draft regulations. The Coast Guard is revising its draft regulations to conform to the proposed international standard and is reopening the comment period of the ANPRM.

Comments were due by January 5, 1990. For further information, contact LT Randall Gilbert, Office of Marine Safety, Security and Environmental Protection, (202) 267-2988.

Notice of Completion of Study

CGD 89-089, Pilotage Study (November 8)

In July 1989, the Commandant of the Coast Guard appointed a study group to examine issues relating to the pilotage requirements. Notice of the study was published in the Federal Register on July 26, 1989 (54 FR 31136). The study is now complete and a copy of the Report of the Pilotage Study Group is available from the Coast Guard. Comments are requested on the recommendations of the pilotage study and must be received on or before February 6, 1990.

Copies of the Report may be obtained from U.S. Coast Guard (G-MVP/12), Room 1210, 2100 Second St., SW, Washington, DC 20593-0001. Comments should be submitted to Executive Secretary, Marine Safety Council (G-LRA-2) (CGD 89-089), U.S. Coast Guard, 2100

Second St., SW, Washington, DC 20593-0001. For further information, contact Mr. John J. Hartke, Office of Marine Safety, Security and Environmental Protection, (202) 267-0217.

Notice and Request for Comments

CGD 88-096, Alternatives for Licensing Commercial Fishing Industry Vessel Operators (December 19)

The Commercial Fishing Industry Vessel Safety Act (Public Law 100-424) requires the Coast Guard to submit to Congress a plan for licensing operators of documented fishing, fish processing, and fish tender vessels. This effort is

directed solely toward the commercial fishermen, not the vessels upon which they serve. The Coast Guard invites the public to identify and develop alternatives for licensing persons aboard these vessels. The Coast Guard seeks comments regarding vessel size, crew size, geographic region, fishery, and any other relevant vessel operating criteria that may form the basis for requiring or not requiring a license. Comments are also requested concerning the existing license options in Title 46 CFR, part 10, for fishing vessel operators.

Comments were due by January 18, 1990. For further information, contact LCDR Bruce Pickard, Office of Marine Safety, Security and Environmental Protection, (202) 267-0219. ■