

Proceedings

of the Marine Safety Council

U.S. Department
of Transportation
United States
Coast Guard



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ISSUE NO.

UNITED STATES COAST GUARD



MASTER
LICENSE

This is to certify that _____
having been duly examined and found competent by the
undersigned, is licensed to serve as Master of United States
Steam or Motor Vessels of all Gross Tons upon Oceans



for the term of five years from this date

Given under my hand this _____ day of _____, 19 _____

Signature

Officer in Charge of Marine Inspection

Proceedings

of the Marine Safety Council

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cover

Licenses to engage in Merchant Marine occupations are granted only to those who demonstrate competence; this is one of the Coast Guard's means of promoting safe ship operation. The present licensing system, however, developed in a haphazard way and is confusing and restrictive. The Coast Guard's new license structure will simplify licensing procedures and establish career patterns for mariners. An article describing the proposed system begins on page 36.

Metal Fires on Ships Subject of Report

A recently released report describes potential hazards in the marine transport of bulk cargoes of ferrous metal.

The report, "Ferrous Metal Fires," discusses measures for monitoring and preventing the spontaneous overheating of such cargoes and was prepared for the Coast Guard by the National Research Council, National Materials Advisory Board, Committee on Maritime Hazardous Materials.

The study describes how such fires occur and reviews methods for intervening in a

case of excessive heating of a cargo in a ship's hold. Thomas B. King, chairman of the Department of Metallurgy at the Massachusetts Institute of Technology, headed the panel responsible for the report.

Copies of the report can be ordered for \$9 each from the National Technical Information Service, Springfield, Virginia 22161. Order No. PB 82-263161 should be specified.

(An article on this subject, "Too Many Fires in the Iron," by John F. McAnulty, appeared in the September/October 1982 issue of the Proceedings.)

Help in Preparing Documentation is on the Way

Are you confused about your packaged Hazardous Materials/Dangerous Goods export shipments? Do you need some assistance in preparing the shipping papers required by Part 172 of Title 49 of the Code of Federal Regulations and/or the International Maritime Dangerous Goods (IMDG) Code? A new brochure may be just the answer.

"Hazardous Materials/Dangerous Goods Documentation of United States Export Shipments by Water" should be available by the time of this printing from the National Committee on International Trade Documentation (NCITD), 350 Broadway, Suite 1200, New York, New York 10013; tel.: (212) 925-1400. The cost of a single copy is \$2.50 (add \$.60 for postage and

handling).

A guide to proper documentation, the brochure contains many useful examples of properly prepared shipping papers. In addition, it explains how to use the Optional Table (49 CFR 172.102). The NCITD brochure could be of tremendous assistance to shippers, freight forwarders, brokers, and carriers. We ask that you let potentially interested non-*Proceedings* readers know of its existence.

Such a guide can serve its purpose only if you are working with up-to-date regulations. Your copy of Title 49 of the CFR should read "Revised as of October 1, 1981." Also, you should be aware that the 19th amendment to the IMDG Code became effective November 1, 1982.

Safety and Maneuverability of Mississippi Tows Studied

HYDRONAUTICS, Incorporated, a hydronamics research firm based in Laurel, Maryland, is currently studying the maneuverability and navigational safety of typical river tows in the Upper Mississippi River. This project is jointly supported by the Coast Guard and the U.S. Army Corps of Engineers.

The study includes extensive model tests in open and restricted waters, including tests with modeling of submerged wing dams, which were used in the past to narrow the navigation channel and which are an important factor in the Upper Mississippi River. The resulting test data will be used to simulate and study river tow maneuvering and safety, as a function of water depth, for the stretch of river between Lock and Dams 3 and 4. This section of the river has been identified by the Corps of Engineers as one having particular navigation difficulties and as being particularly prone to siltation.

A final report on the project is scheduled to be delivered to Coast Guard Headquarters in late September 1983.

NOAA Reports on Deep Seabed Mining

The Deep Seabed Hard Mineral Resources Act was signed into law on June 28, 1980. This act charged the National Oceanic and Atmospheric Administration with developing a regulatory framework in which, ultimately, commercial recovery

of manganese nodules could proceed in an environmentally sound manner. The law also required NOAA to conduct a marine research program to support the regulation of mining activities, seabased nodule processing, and ocean disposal of processing wastes. "Deep Seabed Mining, Marine Environmental Research Plan 1981-85," prepared by NOAA's Office of Ocean Minerals and Energy, grew out of that research effort.

This first 5-year research plan is based on the results of previous research (the Deep Ocean Mining Environmental Study and numerous related studies), the results of many workshops, and comments and recommendations from academia, industry, the public sector, other Federal agencies, and state governments. It outlines the areas to be studied and the estimated costs associated with each program. Two objectives are identified as being critical to the research program:

- developing the capacity to assess environmental impacts related to deep seabed mining and at-sea processing and disposal, and
- developing the capability to predict and gauge the

extent of potential impacts so that, if necessary, mitigating strategies can be developed.

Copies of the report are available from NOAA's Office of Ocean Minerals and Energy, 2001 Wisconsin Avenue NW, Washington, DC 20235.

Seminar on Arctic Technology Scheduled at MIT

"Arctic Technology and Policy: An Assessment and Review for the Next Decade" is the title of the MIT Sea Grant conference to be held at the Massachusetts Institute of Technology March 2 - 4, 1983.

Two lectures will be held the opening day. R. Tucker Scully, Director of the Office of Oceans and Polar Affairs at the Department of State, will deliver the Sea Grant Lecture, "Arctic Policy: Opportunities and Perspectives." Ira Dyer, a professor in the Department of Ocean Engineering at MIT and chairman of the conference, will deliver "Scientific and Technological Challenges of the Arctic."

Among the topics to be covered the second and third days of the conference are arctic oceanography, arctic seismic exploration, ice mor-

phology, arctic climatology, and modeling, engineering properties of ice, the legal-political regime of the arctic resource economics of the arctic, environmental considerations in the arctic, arctic offshore technology, and ice-breaking technology.

Further details and registration materials are available from Elizabeth Harding, MIT Sea Grant Information Office, 77 Massachusetts Avenue, Cambridge, Massachusetts 02139; tel.: (617) 253-3461.

MarAd Releases Port Report

The Maritime Administration has released the first of what is to be an annual report on the status of the public ports of the United States.

"A Report to the Congress on the Status of the Public Ports of the United States" describes problems which ocean and inland waterway ports are experiencing as a result of technological changes, resource allocation, competition, environmental concerns, inflation, and legislation and regulation at all levels of government.

Limited copies are available from MarAd's Public Affairs Office, 400 7th Street SW, Washington, DC 20590.

Keynotes

The following items of general interest were published in the FEDERAL REGISTER between November 19, 1982, and December 20, 1982:

Final rules: CGD 8-82-02 Anchorage Regulations, Lower Mississippi River, November 26, 1982. CGD 80-069 Regu-

lated Navigation Area, New Haven Harbor, Vicinity of Tomlinson Bridge, correction, November 28, 1982. CGD 82-018 Ports of Documentation, December 2, 1982. CGD 82-102 General Bridge Locations and Clearance and Drawbridge Operation Regulations, De-

ember 2, 1982. CGD 11-82-09 Safety Zone in the Vicinity of National Steel and Shipbuilding Company, Shipway Four, December 2, 1982. CGD 7-82-04 Drawbridge Operation Regulations; Hillsborough County, Florida, December 2, 1982. CGD 7-82-09 Draw-

bridge Operation Regulations; Lake Worth, Atlantic ICW, Palm Beach County, Florida, December 2, 1982. CGD 05-82-01 Safety Zone; Croatan Sound, North Carolina, December 2, 1982. CGD 11-82-01 Anchorage Grounds, Los Angeles/Long Beach, California, December 16, 1982.

Notices of proposed rule-making (NPRMs): CGD 09-82-15 Drawbridge Operation Regulations; Keweenaw Waterway, Michigan, November 26, 1982. CGD 8-82-01 Anchorage Grounds, Western Florida, December 2, 1982. CGD 01-82-015 Drawbridge Operation Regulations; Back Cove, Portland, Maine, December 9, 1982. CGD 81-067 Regulated Navigation Area, Ice Season, December 16, 1982. CGD 3-82-31 Anchorage Grounds, Delaware Bay and River, December 20, 1982.

Questions concerning regulatory dockets should be directed to Commandant (G-CMC), U.S. Coast Guard, Washington, DC 20593; tel.: (202) 426-1477.

* * *

Cargo Monitors on Tank Vessels Carrying Oil in Bulk (CGD 76-088(b))

In 1977 the Coast Guard published in the FEDERAL REGISTER proposed rules requiring the installation and use of cargo monitors on board tank vessels of 150 gross tons and over. These devices would aid in reducing oil pollution in operational discharges from tank vessels. The proposal applies both to U.S. seagoing vessels and to foreign vessels that call at U.S. ports.

The proposal stemmed

from U.S. ratification of the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73). The MARPOL Protocol requires the use of cargo monitors on seagoing tank vessels.

A Supplemental NPRM was published on December 20, 1982. That notice includes minor changes in the proposal made in response to comments received and sets the date by which equipment must be installed: October 2, 1983, the day the MARPOL Protocol enters into force. (Existing vessels will have a 3-year grace period: for them, the effective date will be October 2, 1986.) The public will have 90 days from the date of publishing to comment on the revised proposal.

For further information, contact LT Jeff Lantz, Commandant (G-MVI-5), U.S. Coast Guard, Washington, DC 20593; tel. (202) 426-4431.

Actions of the Marine Safety Council

At its December meeting the Council considered a notice of proposed rulemaking for CGD 82-028:

Segregated Ballast, Dedicated Clean Ballast, and Crude Oil Washing on Tank Vessels of 20,000 DWT or More, But Less Than 40,000 DWT, Carrying Oil in Bulk

Section 5 of the Port and Tanker Safety Act of 1978 requires a combination of segregated ballast tanks, dedicated clean ballast tanks, and crude oil washing systems on all U.S.-flag 20,000- to 40,000-

DWT tank vessels which will be more than 15 years old after 1985. The Act also applies to foreign vessels in this weight class trading in U.S. ports. This regulatory proposal would implement Section 5 of the Act.

The Coast Guard expects controversy over some aspects of the proposal, namely:

- The standards mandated by the Act are more stringent than those in the IMO international agreements;
- The Act was a unilateral U.S. action affecting the worldwide shipment of oil;
- The cost of compliance will be substantial;
- In the four-year period since the Act was passed, industry views have become polarized. The shipbuilding industry and those vessel operators who have invested in new construction in anticipation of the 1978 standards' being implemented support the Act's provisions. Those who have not yet made such an investment and foreign vessel owners who will need to upgrade their vessels to trade in U.S. ports oppose the measure.

The proposal, unanimously approved by the Council, is classified as "significant" because of the high compliance costs. Accordingly, it must be approved by the Secretary of Transportation before it can be published. Publication is expected this month or next month. †

Guidance for the Uniform Application of Certain Rules of the International Regulations for Preventing Collisions at Sea, 1972

The following clarifications have been issued by the Maritime Safety Committee of the International Maritime Organization (IMO):

Clarification of the definition "Vessel constrained by her draft", Rule 3(h)

Not only the depth of water but also the available navigable water width should be used as a factor to determine whether a vessel may be regarded as constrained by her draft. When determining this, due account should also be taken of the effect of a small underkeel clearance on maneuverability of the vessel and thus her ability to deviate from the course she is following. A vessel navigating in an area with a small underkeel clearance but with adequate space to take avoiding action should not be regarded as a vessel constrained by her draft.

Clarification of the application of the word "underway", Rule 3(i)

When applying the definition of the term "underway" mariners should also have regard to Rule 35(b) where it is indicated that a vessel may be underway but stopped and making no way through the water.

Clarification of the implication of the words "not to impede" as appearing in Rules 9(b), (c) and (d), 10(i) and (j) and 18(d)

When a vessel is required not to impede the passage of another vessel, such vessel shall so far as practicable navigate in such a way as to avoid the development of risk of collision. If, however, a situation has developed so as to involve risk of collision, the relevant Steering and Sailing Rules shall be complied with.

Clarification of the relation between Rule 10 and the Rules of Part B, Sections II and III

A vessel navigating in or near a traffic

separation scheme adopted by the Organization shall, in particular, comply with Rule 10 of the International Regulations for Preventing Collisions at Sea, 1972, to minimize the development of risk of collision with another vessel. The other Rules of the 1972 Collision Regulations apply in all respects, and particularly the Rules of Part B, Sections II and III, if risk of collision with another vessel is deemed to exist.

Clarification of the transference within a lane, Rule 10(b)(i)

It is within the ordinary practice of prudent seamanship and in keeping with the provisions of Rule 10 of the 1972 Collision Regulations that a vessel using a traffic lane may make a transfer within a lane from one side to the other, provided such a transfer is accomplished at as small an angle to the general direction of traffic flow as is practicable.

Clarification on the use of inshore traffic zones by small vessels, Rule 10(d)

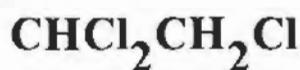
To comply with Rule 10(j) and for reasons of safe navigation a vessel of less than 20 meters in length or a sailing vessel, even when through traffic, may use inshore traffic zones.

Clarification of the relation between Rule 18(d) and the Rules of Part B, Sections II and III

A vessel constrained by her draft shall, when risk of collision with another vessel in a crossing or head-on situation exists, apply the relevant Steering and Sailing Rules as a power-driven vessel. She should, when showing the signals prescribed by Rule 28, have her engines ready for immediate maneuver and proceed at a safe speed as required by Rule 6.



1,1,2-Trichloroethane:



Synonyms:

beta-T
beta-trichloroethane
ethane trichloride
vinyl trichloride

Physical Properties

boiling point: 114°C (237°F)
freezing point: -38°C (-36°F)
vapor pressure at
20°C (68°F): 19 mm Hg
35°C (95°F): 40 mm Hg

Threshold Limit Values (TLV)

time weighted average: 10 ppm; 45 mg/m³
short term exposure limit: 20 ppm; 90 mg/m³

Flammability Limits in Air*

lower flammability limit: 8.4% by vol.
upper flammability limit: 13.3% by vol.

Combustion Properties

Standard tests in air indicate that 1,1,2-trichloroethane is not flammable.

Densities

liquid (water = 1.0) 1.44
vapor (air = 1.0): 4.55

Identifiers

CHRIS Code: TCM
Cargo Compatibility Group: 36 (Halogenated Hydrocarbons)

1,1,2-trichloroethane is "nasty stuff." It can kill humans and can "eat" aluminum, zinc, rubber, and various plastics and coatings. Its corrosive properties can be guarded against by using steel and stainless steel in the construction of tank systems. Its toxicity to human beings can be guarded against only by taking the proper precautions.

[1,1,2-trichloroethane should not be confused with the 1,1,1-trichloroethane isomer (same chemical formula, slightly different structure). The 1,1,1-isomer has very low toxicological properties—in fact, the U.S. Coast Guard has put it in the "non-regulated" category.]

1,1,2-trichloroethane exists at room temperature as a colorless liquid and has a sweet, chloroform-like odor. It is used primarily in the making of other organic (carbon-containing) compounds and as a solvent for oils, fats, waxes, and natural resins.

If allowed to remain on the skin, liquid 1,1,2-trichloroethane will be readily absorbed. Although a single instance of exposure will generally not cause any damage if the affected skin is cleaned immediately, skin subjected to repeated or prolonged exposure will become irritated. Exposed skin should be promptly washed with soap and water. Contaminated clothing should be removed and laundered before being worn again. It may be impossible to decontaminate leather shoes that have absorbed large amounts of 1,1,2-trichloroethane; if so, they should be discarded. If irritation continues after these measures, medical attention should be sought.

Ingestion (swallowing) of liquid 1,1,2-trichloroethane will produce symptoms of moderate to severe poisoning. Victims of ingestion should be made to vomit immediately (only if conscious, of course). This can be accomplished by giving an emetic such as two tablespoons of salt in a glass of warm water or having the victim touch the back of his/her throat with a finger. An unconscious person should never be made to vomit.

The vapor of 1,1,2-trichloroethane is highly toxic if inhaled. It can depress the central nervous system, causing narcosis (drowsiness, dizziness, eventually unconsciousness) to an even greater degree than chloroform. In high enough concentrations, it can cause respiratory arrest—and death. Laboratory animals repeatedly exposed to 1,1,2-trichloroethane vapor have suffered liver and kidney damage.

Overexposure through inhalation (detectable by the symptoms of narcosis) should be treated by removing the victim to fresh air and giving

* A high-energy source (such as an electrical charge) is necessary to ignite 1,1,2-trichloroethane.

artificial respiration, if needed. Medical attention should be sought at once.

In cases of eye exposure (either to the liquid or to high-concentration vapors), the eyes should be flushed immediately with large amounts of water, care being taken to also flush the areas under the upper and lower lids. If irritation persists, medical attention should be sought.

It is generally not advisable to wear contact lenses when working with chemicals that could cause any type of eye damage, since the chemical can become trapped between the lens and the eye. If the lens is not removed (as might happen if a victim is unconscious and cannot communicate with his rescuers), serious, even permanent eye damage could result. It is always a good practice to wear chemical goggles or a face shield.

Despite 1,1,2-trichloroethane's high toxicity, the National Institute for Occupational Safety and Health and the Occupational Safety and Health Administration have recorded no cases of narcosis or liver and kidney damage in their monitoring of industrial operations. This demonstrates the effectiveness of the stringent precautionary measures taken by industry.

The U.S. Coast Guard regulates 1,1,2-trichloroethane for shipment in bulk by tankship in Part 153 of Subchapter O, Title 46, of the Code of Federal Regulations. IMO, the International Maritime Organization, regulates it for bulk shipment in Chapter 6 of its Chemical Code.

**Cargo and Hazards Branch
Marine Technical and
Hazardous Materials Division**

The International Chamber of Shipping (ICS) is a London-based organization representing national shipowners' associations. It is international in scope and has observer status within the International Maritime Organization (IMO). One of ICS' primary functions is to coordinate solutions to problems that affect shipowners on a broad scale. Part of the organization's work

consists of developing internationally recognized publications which are used as guides or standards of practice by both government and industry. The brochure on avoidance of slack tanks in ballast in OBOs (Oil/Bulk/Ore Carriers), reproduced here, is but one example of ICS' efforts.

RECOMMENDATIONS CONCERNING SAFETY IN OBOs

THE AVOIDANCE OF SLACK HOLDS IN BALLAST

(Failure to observe these recommendations could endanger your ship)

Operations should be carried out in accordance with the guidance in the International Safety Guide for Oil Tankers and Terminals (ISGOTT).

The carriage of oily ballast in slack holds is **hazardous**.

A slack hold with clean ballast and a flammable atmosphere should be assumed **hazardous**.

Inert gas systems can fail, and tank atmospheres must be monitored.

For the purpose of these recommendations a "slack" hold is a hold in which the sounding of the liquid content is not into the coaming.

Slack Holds

It is particularly important for combination carriers to have their holds inerted, because whenever a hold in an OBO carrier (which could extend the full breadth of the ship) is partially filled with clean or oily ballast, surface agitation of this ballast can occur at small angles of roll, and this can result in the generation of static electricity. The agitation is

sometimes referred to as "sloshing," and it can happen whenever the liquid level of the hold is not pressed up into the coaming.

NOTE

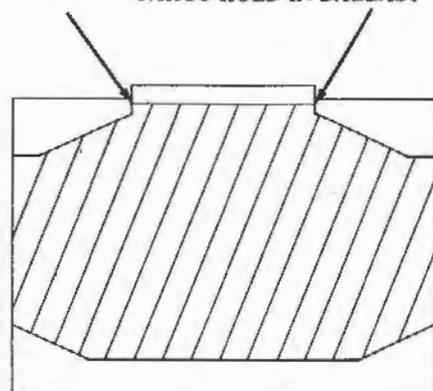
In drawing up this recommendation no account has been taken of possible structural damage caused by a sloshing effect; for information on this aspect the advice of Classification Societies should be sought.

FURTHER RECOMMENDATIONS

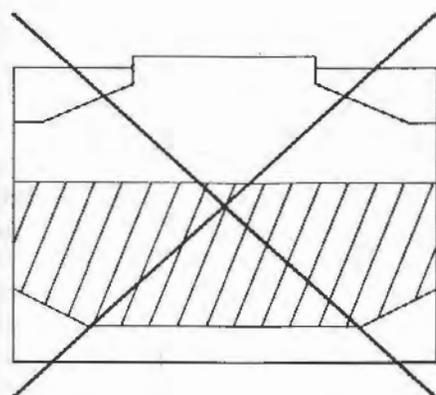
Gas-free Requirements

During loading, carriage, and discharging of solid cargoes, all holds/cargo tanks, non-inerted slop tanks, cargo pumphooms, cofferdams, duct keels, and other adjacent void spaces should be maintained in a gas-free condition. If, after 14 days, no hydrocarbon gas has been detected, frequency of monitoring may be reduced to every second day.

CARGO HOLD IN BALLAST



ANY LEVEL
BELOW
THIS POINT
CAN BE
HAZARDOUS



Slops

When cargoes other than oil are to be carried, slops should be dealt with as follows:

1. Slops should be discharged ashore and the slop tanks cleaned and ventilated to such a degree that the tanks are completely gas-free.
2. If slops are to be retained on board, they should be contained in a properly constituted slop tank and inerted.
3. The ICS strongly recommends that owners make every effort to comply with paragraph 1 after one voyage if the vessel is to continue trading in dry bulk cargoes.

Further guidance on safe operations in combination carriers and the use of Inert Gas can be obtained from the following publications:

- The IMO publication "Inert Gas Systems for Oil Tankers (Revised Regulation 62 of Chapter II-2 of the International Convention for the Safety of Life at Sea, 1974 and Guidelines for Inert Gas Systems)" and
- The ICS/OCIMF (International Chamber of Shipping/Oil Companies International Marine Forum) publication "International Safety Guide for Oil Tankers and Terminals."

The ICS recently joined with the OCIMF to publish a guide for masters whose vessels are in peril. Subjects covered are: assistance, communications, casualty reports, evaluation of situation, action when ship is disabled but not aground, towing, transfer of cargo, action when ship is aground, and legal matters. Also incorporated into the guide are the results of ship drifting research and a series of transparent overlays to help masters assess drift. Research has shown that much can be done to influence not only the rate but also the direction of drift—up to 110° or more, depending on ship type and condition of loading.

Peril at Sea and Salvage—A Guide for Masters is available from Witherby & Co., Ltd., 32/36 Aylesbury Street, London EC1R OET for £7 a copy (includes surface mail).

A comprehensive list of ICS publications will be published in the *Proceedings* as soon as a list of prices in U.S. dollars becomes available. †

Nautical Queries

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

DECK

1. Frapping lines are fitted to lifeboat davits to
 - A. reduce the swinging of the lifeboat as it is being lowered from the embarkation level.
 - B. secure the lifeboat in the davits when it is in the stowed position.
 - C. hold the lifeboat to the ship's side until the tricing lines are passed.
 - D. be used as a safety line in an emergency.

REFERENCE: AMSM

2. Bulkheads or decks of the "A" class shall be composed of steel or an equivalent metal and shall be suitably stiffened and made intact with the main structure of the vessel. They shall be so constructed that, if subjected to the standard fire test, they would be capable of preventing the passage of flame and smoke for

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

- A. 5 minutes.
- B. 10 minutes.
- C. 30 minutes.
- D. 60 minutes.

REFERENCE: 46 CFR 92.07-5(b)

3. The sextant altitude error resulting from hs' being measured from the earth's surface and Ho's being calculated from the earth's center is called

- A. refraction.
- B. augmentation.
- C. semidiameter.
- D. parallax.

REFERENCE: Bowditch, Navigation Dictionary

4. The only person that can authorize alternate stowage of a hazardous material is

- A. a representative of the National Cargo Bureau.
- B. a qualified U.S. Coast Guard Marine Inspector.
- C. the U.S. Coast Guard Captain of the Port.
- D. the local representative of the shipper.

REFERENCE: 49 CFR 176.65

5. On the high seas, a fog signal consisting of one prolonged blast followed by four short blasts would indicate the presence of a

- A. vessel being towed.
- B. fishing vessel engaged in trawling.
- C. vessel at anchor warning of her location.
- D. power-driven pilot vessel on station underway.

REFERENCE: COMDTINST M16672.2

ENGINEER

1. An all-purpose nozzle on a firehose under pressure is most difficult to control when changed from

- A. solid stream to fog.
- B. shut-off to solid stream.
- C. low- to high-velocity fog.
- D. fog to shut-off.

REFERENCE: MarAd Fire-fighting

2. A Class C fire would be burning

- A. clothing.
- B. wood.
- C. hydraulic fluid.
- D. switchboard insulation.

REFERENCE: MarAd Fire-fighting

3. A fire may be extinguished by

- A. removing the heat.
- B. eliminating the fuel.
- C. excluding the oxygen.
- D. any of the above.

REFERENCE: MarAd Fire-fighting

4. Which extinguisher would be effective in an electrical fire and would not leave a residue on equipment?

- I. CO₂
- II. Halon 1211

- A. I only
- B. II only
- C. Either I or II
- D. Neither I nor II

REFERENCE: MarAd Fire-fighting

5. The principal difference between the high-velocity tip and the low-velocity applica-

tor used with the all-purpose nozzle is the

- A. difference in available water pressure.
- B. number of personnel required to effectively use each of them.
- C. degree to which the water stream is broken up.
- D. ability to exclude free oxygen.

REFERENCE: MarAd Fire-fighting

ANSWERS

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

Lessons from Casualties

Another Cold-water Drowning

The final report of the last moments of another fisherman has been received at Coast Guard Headquarters. The details have an all-too-familiar ring. The weather was not bad, 15- to 20-knot winds and 3- to 5-foot seas. It was cold, 2° F, and there was slush ice on deck. The vessel was a new 40-foot, 25-gross-ton stern dragger.

Two crewmen were on the work deck aft, preparing to set the fishing gear. They were getting ready to release the 570-pound trawl doors from the brackets in which they were secured for transit. The brackets were on opposite sides of the vessel between the 18-inch bulwark and a leg of the gallows frame holding the net roller. One of the three chains securing each door, the backstrap chain, was on the outboard side of the stowed door. Sometimes the backstrap would foul on the outboard side of the door and a crewman would have to reach around to release it.

On this day in January 1982, the backstrap chain probably fouled. The master of the vessel was watching the two crewmen prepare the doors for release when he turned to the compass for a moment and made a small course correction. This took three or four seconds. As he turned back to the stern, he saw a "flash of yellow" going over the side out of the corner of his eye. The master yelled at the other man on deck, yelled to the cook to get a life ring, and backed the vessel to a distance of about seven feet from the man in the water. Within two minutes or so, the man in the water was alongside and being held. He was too heavy to be pulled over the bulwark, and several attempts to get him aboard were unsuccessful. After about 10 minutes, the man in the water

lost consciousness. The man on deck was losing the ability to use his hands in the cold (he was later treated for severe frostbite of the hands). The master went below, got an inflatable life raft, and launched it next to the man in the water. The master went into the raft, dragged the man in, and then used the fishing vessel's cargo boom to lift the man aboard.

Nobody on board the fishing vessel had been trained in cardiopulmonary resuscitation (CPR) or first aid. A Coast Guard emergency medical technician (EMT) advised the crewmembers by radio how to care for the man until they could get into the lee of an island and transfer the man to a Coast Guard helicopter. The man was pronounced dead on arrival at a hospital. The cause of death was listed as drowning and hypothermia.

Two lessons can be learned from this casualty.

First, all persons working at sea need training in first aid and CPR. There is no rescue squad at the corner fire station at sea. Hypothermia training is also very valuable, even in mild climates, because most sea water is considerably below normal body temperature.

Second, hazards of design must be removed. The backstrap chain, which had been in operation only a few weeks, was known to occasionally become fouled on the outboard side of the trawl door. It was apparently not an unusual event. This arrangement should have been examined to eliminate the fouling or in some other way eliminate the need for a crewman to reach outboard to unfoul the chain. This particular trawl door hazard may be limited to this vessel design, but all working vessels have potential hazards which should be of concern to masters and owners as well as crewmembers who are directly exposed to them. †

Putting Logic into Licensing

by LCDR George N. Naccara
Merchant Vessel Personnel Qualifications Branch

While the Coast Guard's licensing system has served its purpose of maximizing safety in ship operations, some of its features have made it the target of criticism. The following article explores the system and explains the changes being proposed by the Coast Guard.

Studies have indicated that at least 85 percent of all reported vessel casualties are the direct result of human error. If we include the category of pure machinery or structural failure, which may be indirectly the result of human error, the total is raised to nearly 100 percent. Therefore, the need to ensure some level of competence in the officers who operate and guide vessels is of paramount concern.

The Coast Guard is mandated by law to promote the safety of life and property on the waters of the United States. Certainly one of the most important aspects of its mandate is its efforts to ensure the overall competence and minimum qualifications of the personnel who serve aboard merchant vessels. The Coast Guard does this through its licensing program. A license, in fact, has been described as a "certificate of competence."

Licensing is a generic term which encompasses all forms of regulation that give the license holder legal authority to engage in his occupation. In our case, that means the Merchant Marine officer serving on a commercial vessel of the United States. The need for safety in public transportation is so obvious that everyone is quick to recognize the need for maintaining checks on the capabilities of those who fly airplanes, drive buses, or navigate ships. While licensing certainly restricts the freedom of the individual, it is intended to

serve the overriding purpose of protecting the health and safety of the public and the marine environment.

The Coast Guard system is a mandatory licensing program rather than a voluntary certification system. Under this mandatory program, a person may not engage in a Merchant Marine occupation unless he or she has been authorized to do so by the Coast Guard. I maintain that these occupations are so closely associated with public health and safety that, without some form of regulation, the public and the environment would have little or no protection against incompetent practitioners who might do serious harm. Only those found to be competent are granted licenses. Anyone seeking the services of a licensed individual will have at least some assurance that such a practitioner was deemed by the Coast Guard to possess the necessary minimum amount of competence at the time he or she was granted a license.

The U.S. System

The licensing of deck and engineer officers for the U.S. Merchant Marine has been the responsibility of the U.S. Coast Guard since 1942. Before that, it was the responsibility of the Bureau of Marine Inspection and Navigation in the U.S. Department of Commerce.

There are numerous laws governing the licensing of Merchant Marine personnel. These laws are supplemented by Coast Guard regulations and policy as contained in Titles 33 and 46 of the Code of Federal Regulations.

In addition to our domestic laws, there are international conventions which affect the licensing and certification of personnel (the SOLAS Conventions, the Officers' Competency Convention, etc.). The Maritime Safety Committee of the International Maritime Organization (IMO) established a Subcommittee on Standards of Training and Watchkeeping in 1971. Its objective was to develop universally acceptable standards to improve training and strengthen the professional qualifications of seafarers. The result of its work was the subject of an international conference in 1978, the aim of which was to establish a minimum standard of competence for ships' officers. While the Standards of Training, Certification and Watchkeeping for Seafarers, 1978 (STCW) Convention has not yet been ratified by the United States, it has been a prime consideration in the Coast Guard's planning and has had an obvious impact on the design of the Coast Guard's new licensing structure.

Licenses are presently issued through 16 regional examination centers located in major maritime centers across the U.S. There are also three monitoring facilities which provide proctors for license examinations. The regional examination centers were created during the past year to further increase the efficiency of the Coast Guard's overall licensing and certification process. This has been accomplished by reducing the number of licensing offices from 49 to 16, assigning experienced personnel to the offices, and streamlining procedures. The licensing program is supervised by the Merchant Vessel Personnel Division to which I am assigned at Coast Guard Headquarters in Washington, DC.

Generally speaking, there are two major categories of Merchant Marine officers: deck and engineer. There are also subspecialties, such as operator of uninspected towing vessels, motorboat operator, radio officer, etc. The deck officers normally stand watches on the bridge of a vessel and are responsible for the safety and navigation of a ship. This includes responsibility for radar, shiphandling, navigation, observing the Rules of the Road, cargo stowage and handling, and understanding emergency procedures and related rules and regulations. Engineer officers also have watchstanding responsibilities. The chief engineer and his

assistants, all of whom are licensed to function at various levels, are responsible for the main propulsion system of a ship and all the auxiliary systems, including electrical power, water, firefighting systems and equipment, and all of the ship's machinery. Both deck and engineer officers supervise unlicensed personnel, who carry out a wide variety of functions on board a ship. These unlicensed personnel, usually mariners with less experience and training, perform tasks normally associated with lower levels of responsibility.

The Drawbacks of the Present Structure

The existing licensing regulations have been developed over many years. The present system has evolved in a haphazard, uncoordinated, and often chaotic way. The conditions which originally led to the need for particular licenses have changed over the years, yet the license system itself has not been adaptable and has become more fragmented than ever. Many new sections and licenses have been created which detract seriously from the uniformity of the overall scheme.

The present structure is so complex that it defies logical interpretation. Separate licensing categories have been created for oceans, coastwise routes, inland waters, the Great Lakes, and Western Rivers routes. Licenses have varied according to the vessel's tonnage, the type of cargo carried, the segment of the industry being served, the type of propulsion system, and the total shaft horsepower of the vessel, as well as whether or not the vessel was Coast Guard-inspected. There are presently over 40 different masters licenses, nearly 40 different mates licenses, innumerable pilots licenses with various route combinations, and over 30 different engineer licenses, in addition to those for the subspecialties. While the Coast Guard created these licenses in response to laws passed by Congress, it is obvious that many of them are the result of administrators' interpretation of the statutes. It is also obvious that Congress and the Coast Guard have been subjected to pressure from a variety of special-interest groups. This has led to the creation of many special licensing categories to accommodate particular needs.

All of these factors have led to some of the most frequently heard criticisms of the licensing system: there are no career patterns, and there is no logical progression from one license category to another, from one tonnage category to another, or from one segment of the industry

or geographical area to another. These obstacles to personal mobility are a major shortcoming of the present system and certainly affect safety in an indirect manner. Experienced mariners often leave their careers when they find that employment opportunities are limited and their licenses are not adaptable to other segments of the industry.

The Coast Guard's New System

The Coast Guard is now in the process of setting up a new license structure. Its intention is to establish career patterns, simplify the license structure for ocean and inland service, delete many of the trade-restricted licenses, and simplify the license procedures by redesigning the format of the regulations. In essence, these new regulations will provide a license structure which will permit an experienced, knowledgeable, and ambitious person to advance in the maritime industry with a minimum of restrictions.

The new license structure will promote personal mobility throughout the industry. The Coast Guard will accept toward most license levels a certain amount of service on vessels of lower tonnage or horsepower than it has in the past. This will enable Merchant Marine personnel to serve on various smaller vessels in specialized industries, such as the mineral and oil industry or the towing industry, and will not penalize them by denying use of this time toward license upgrading. Another example is the acceptance of cross training for deck and engineer licensed personnel. This will enhance safety by giving marine personnel a better perspective of the operations of the deck and engineering departments. Acceptance of a percentage of a person's experience as an engineer toward a deck license and vice versa will assist that person in many ways (he will not be penalized by loss of creditable time) and will allow management more freedom in planning the work for a vessel on each voyage.

There will be a clear progression for virtually all deck and engineer licenses. The inland licenses are to be separated from the ocean licenses, and there will be progressions from inland to ocean waters. Tonnage categories have been established as 0 - 200, 200 - 1,600, and unlimited above 1,600 gross tons. Master/mate and chief engineer/assistant engineer systems are being established where appropriate. All trade-restricted, route-restricted, or tonnage-restricted licenses have been removed from the progression, and the career pattern

has been made much clearer and easier for mariners to follow. This fact alone should promote personal mobility within the industry, and the long-term result will be an increase in confidence and an increase in safety. The new structure should allow people to pursue longer careers in the Merchant Marine because they will be able to change from one segment of the industry to another without losing any creditable service.

In the lower tonnage category of vessels, the Coast Guard has altered the license progression so that operators and ocean operators will become masters and mates. These licenses will also be extended to a 200-gross-tons limit to conform with international conventions. The Coast Guard feels that this, too, will enhance mobility throughout the industry and will certainly broaden the career prospects of the operator or ocean operator. The new position of mate will also solidify the master's responsibility of command and will provide him with an interim experience level between deckhand and master. As far as safety is concerned, the master will also have a relief watch officer on board vessels where manning requires a master and mate.

License Qualifications

Industry experience and practice are the principal sources for establishing qualifications for licensed personnel. A wide spectrum of knowledge and experience involving many types of ship operations, many different technologies, and many levels of experience must be considered. Three trends are evident in the qualification process:

- the changing characteristics and types of commercial vessels,
- new technical specialties in ship operations, and
- the increased emphasis of formal training as opposed to on-the-job training and experience.

These trends point to a growing need for a broadbased education and a knowledge of technical and administrative subjects. As ships grow more specialized and complex, training and tested performance will become increasingly important. A major issue in the field of qualifications will then be the role of the maritime educational system. The emphasis on

education is illustrated by the Coast Guard's growing practice of accepting certification from approved training courses in place of experience and, in some cases, examinations. There are now over 50 institutions offering nearly 100 approved courses that can be used in lieu of examinations and experience. The Coast Guard has also been considering the use of performance tests such as those done with simulators. A requirement for simulator training is a possibility, as this is one of the few methods that allow the Coast Guard to evaluate actual experience. Unfortunately, the tremendous expense of simulator training has made that type of training impractical for most mariners. Use of this training aid typically costs nearly \$2,000 per week per person. However, since the Coast Guard realizes the value of simulator training, it is prepared to accept simulator work as a partial substitution for service requirements for licenses.

Under the Coast Guard's new system, professional examinations will be limited to entry and command levels. The entry-level examinations will stress technical knowledge and skills, and the command-level examinations will stress administrative and career skills. This two-examination approach to licensing will certainly place greater emphasis on initial educational qualifications. The Coast Guard Institute, which prepares all license examinations, was recently advised to tailor future examination questions to emphasize casualty avoidance and control; this, too, should lead to safer operation of ships. All Merchant Marine licenses are to be issued for a period of five years, and the Coast Guard will require all deck and engineer officers to complete a comprehensive open-book exercise covering many aspects of their responsibilities as a condition for renewal of their licenses. This should ensure that a minimum level of proficiency is maintained among licensed officers.

The Rationale Behind Licensing

A basic question often asked is whether licensing should be done at all. Simply stated, the purpose of licensing is to ensure that all officers have a minimum level of competence to fulfill the duties and responsibilities associated with their particular level of license. The Coast Guard licensing system can be described as a program which is aimed at an objective assessment of each applicant. Never is a licensing decision left to an employer who may have a vested interest in the outcome. In every



State-of-the-art technology allows simulators to provide lifelike, computer-generated images from the "bridge." The simulator shown here belongs to CAORF, the Computer Aided Operations Research Facility, at the U.S. Merchant Marine Academy in Kings Point, New York.

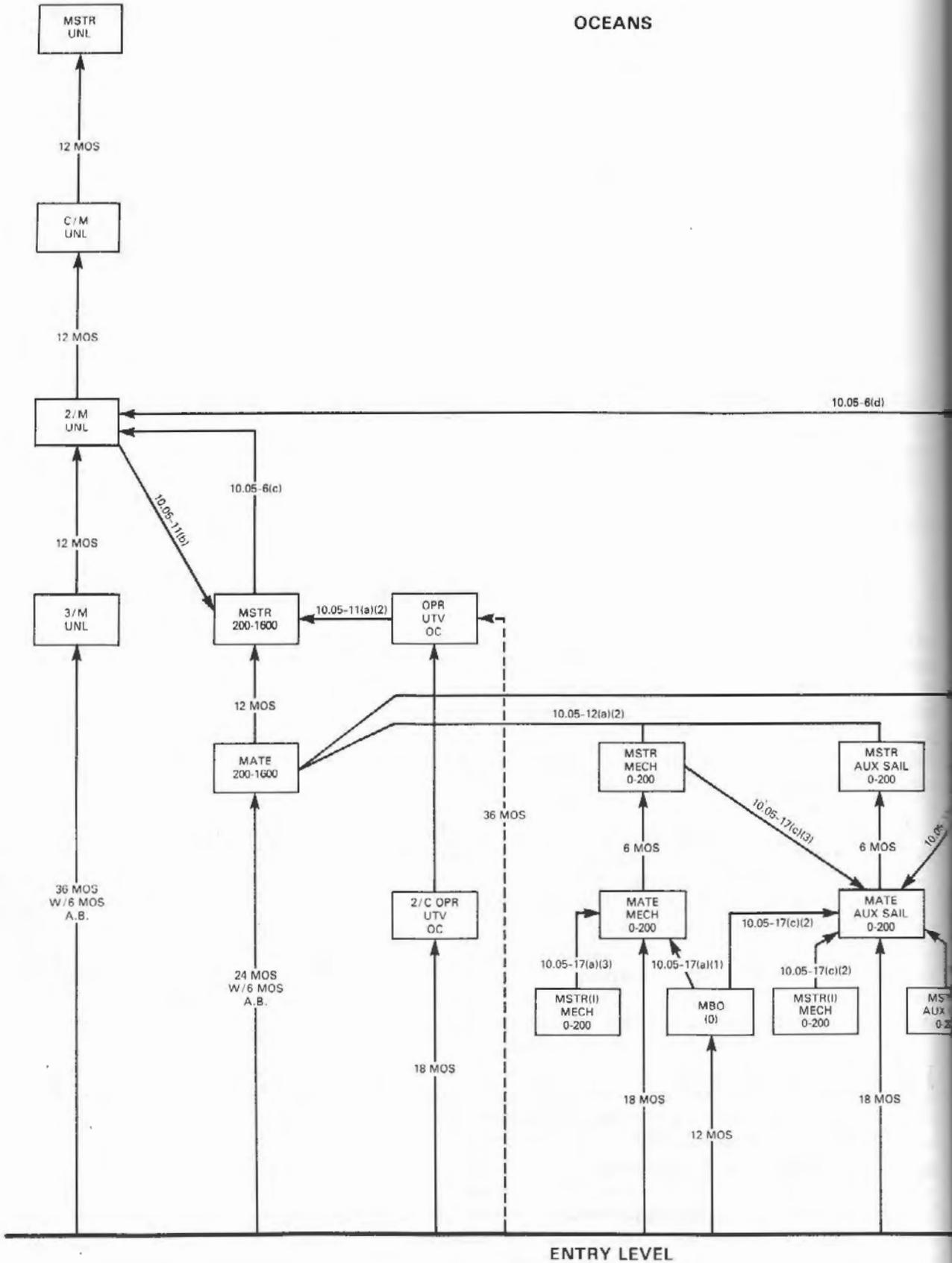
mode of transportation where safety is entrusted to and dependent on the performance of an individual, society has elected to require that a person meet certain standards and obtain a license as evidence of this minimum capability. This is certainly true in the maritime industry. The principal tasks of the licensing program are the establishment of qualifications, the subsequent evaluation of each individual's application, and the preparation and administration of examinations. Qualifications include such items as physical evaluation standards, character standards, professional experience requirements, minimum age requirements, citizenship requirements, and particular types of training or education.

The Coast Guard can stress safety and competence, but it cannot control the operations of each particular vessel. A vessel employed in one industry may be totally different from a sister vessel employed in another segment of the industry, as far as equipment and operating conditions are concerned. The qualification and examination process that the Coast Guard administers is only a brief and minimum review of the basic knowledge which the Coast Guard considers necessary for safely operating a vessel. We make no claim that our examinations are all-encompassing tests on seafaring. We realize that the ingenuity, motivation, and knowledge of an individual more accurately determine the success and the safety of ship-

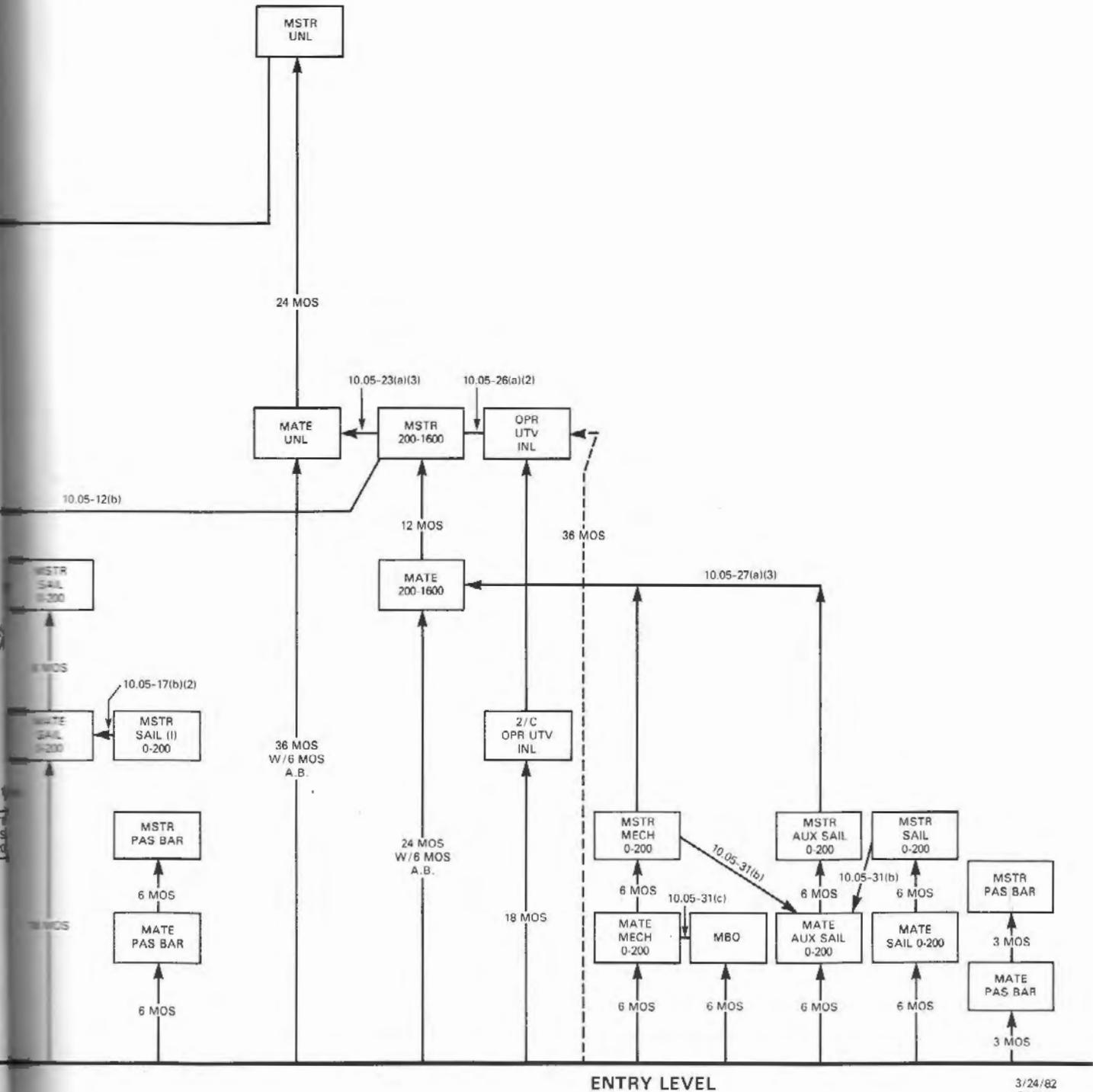
Text continued on page 44

Deck License Structure

OCEANS

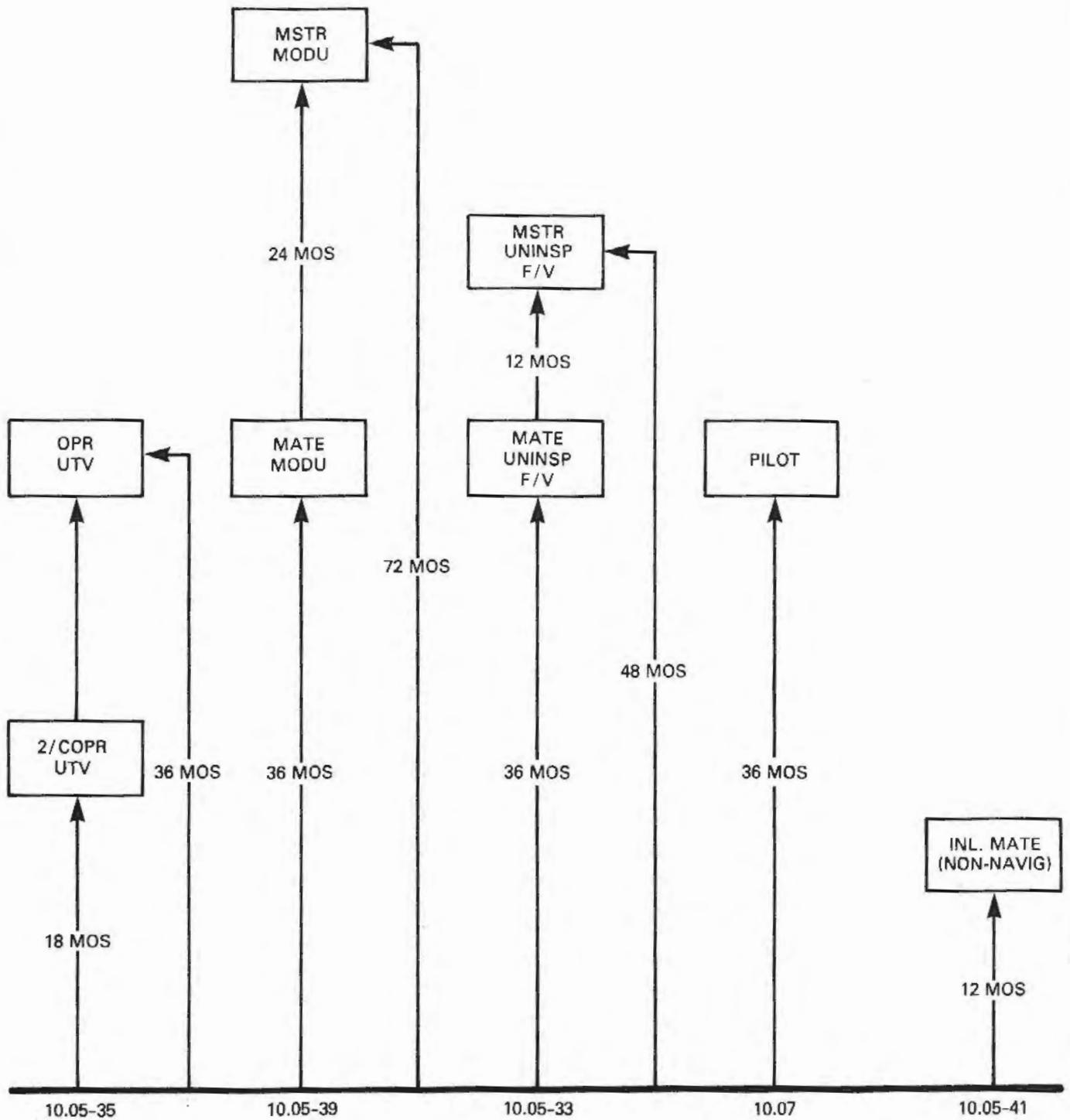


INLAND

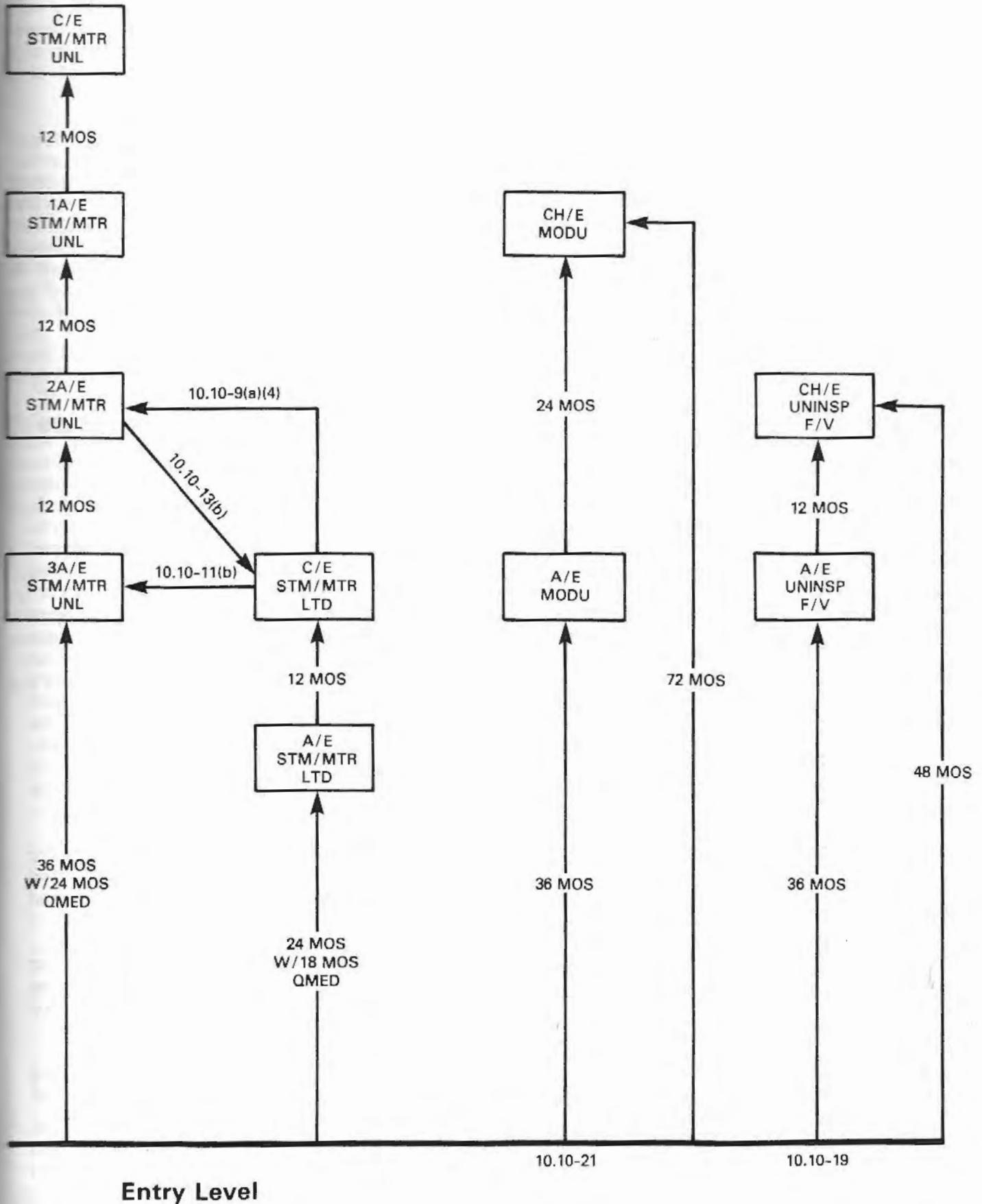


ENTRY LEVEL

Special Deck License Structure



Engineer License Structure



board operations. As a final note, an excerpt from a paragraph in the new proposed regulations best typifies the Coast Guard's approach:

"These regulations do not specify or restrict licenses to particular types of service such as tankships, freight vessels, or passenger vessels. However, it is incumbent on every licensed officer to become familiar with all unique characteristics of each vessel served upon as soon as possible after reporting aboard for duty. As appropriate for a deck or engineer license, this includes but is not limited to: Maneuvering characteristics of the vessel; proper operation of the installed navigation equipment; firefighting and lifesaving equipment; stability and load-

ing characteristics; and main propulsion and auxiliary machinery."

This general familiarity, combined with a certain level of experience, knowledge, and perseverance, forms the basis for safe operation of a vessel, whether it's a 15-foot motorboat or a 200,000-gross-ton tankship.

As this issue was going to press, a notice of proposed rulemaking on the new license structure was on its way to the FEDERAL REGISTER. Interested parties will have 120 days to comment from the date the NPRM is published. Comments received in response to an advance notice of proposed rulemaking published in October 1981 were generally supportive of the new structure.

1

Requirements/Qualifications for Licenses under the New Structure

- 1. Minimum age** - a person who has reached the age of 21 years is eligible for all licenses. Some of the licenses restricted to certain vessel tonnages or routes of operation may be issued to people 18 or 19 years of age.
- 2. Citizenship** - no license shall be issued to any person who is not a citizen of the U.S. (with the exception of licenses for motorboat operators limited to state-numbered vessels).
- 3. Physical examination** - all persons applying for their initial licenses shall be required to pass an examination given by a licensed physician. This examination shall attest to the applicants' acuity of vision, color sense, and general physical condition. When renewing their licenses, the applicants shall again be tested for color vision and general physical condition.
- 4. Character check and references** - a person applying for his initial license must present endorsements from a master and two other licensed officers on a vessel on which he or she may have served. Applicants for initial licenses are also checked by various law enforcement agencies.
- 5. Experience or training** - all applicants for licenses shall present certain minimum quali-

tying experience for each type of license. Experience requirements for Coast Guard-issued licenses range from six months (for a license for a mate on a small passenger vessel) to six years (for a master unlimited license upon the oceans). In the new regulations, experience requirements have been changed rather dramatically. Requirements for total cumulative service will remain unchanged, but the new system will be more flexible in allowing service on different types of vessels and in different waters to be applied toward license levels and categories. In some cases, experience as an engineer will be applicable toward a deck license and vice versa.

- 6. Recency of service** - persons applying for their initial licenses shall have accumulated at least three months of their required service within the past three years.
- 7. Firefighting certificate** - candidates for certain deck licenses and engineer licenses must present a certificate of completion from an approved firefighting course.
- 8. Professional examination** - examinations are required for entry and command levels of all licenses.

Statistics of Casualties

Fiscal Year 1980

Each year the U.S. Coast Guard prepares a statistical summary of the commercial vessel casualties that were investigated by Coast Guard marine investigators during the previous fiscal year.

The public, the industry, and the Coast Guard have used the findings of the investigations to establish standards and determine the need for legislation to improve the protection of safety of life and property at sea.

The master of a vessel is required by law to report a marine casualty as soon as possible after its occurrence to the Officer in Charge, Marine Inspection, at the Marine Inspection Office or Marine Safety Office in the Coast Guard District where the casualty occurred.

The following summary represents casualties for which reports were received at Coast Guard Headquarters in Fiscal Year 1980, which ran from October 1, 1979, to September 30, 1980. In 1980 casualties involving commercial vessels were required to be reported to the Coast Guard whenever the casualty resulted in any of the following:

- actual physical damage to property in excess of \$1,500;
- material damage affecting the seaworthiness or efficiency of a vessel;
- stranding or grounding (with or without damage);
- loss of life; or
- injury causing any person to remain incapacitated for a period in excess of 72 hours, except injury to harbor workers not resulting in death and not resulting from vessel casualty or vessel equipment casualty.

These criteria have since been changed. Under the new criteria, any accident involving the following must be reported:

- an accidental grounding or an intentional grounding which also meets any of the other reporting criteria or creates a hazard to navigation, the environment, or the safety of the vessel;
- loss of main propulsion or primary steering, or any associated component or control system, the loss of which causes a reduction of the maneuvering capabilities of the vessel. Loss means that systems, component parts, sub-systems, or control systems do not perform the specified or required function;
- an occurrence materially and adversely affecting the vessel's seaworthiness or fitness for service or route, including but not limited to fire, flooding, or failure of or damage to fixed fire extinguishing systems, lifesaving equipment, auxiliary power generating equipment, or bilge pumping systems;
- loss of life;
- injury causing a person to remain incapacitated for a period in excess of 72 hours; or
- an occurrence not meeting any of the above criteria but resulting in damage to property in excess of \$25,000. Damage includes the cost of restoring the property to the service condition which existed prior to the casualty, including the cost of salvage, gas freeing, and drydock. It does not include such items as demurrage.*

* As this issue was going to press, a final rule was being readied which will delete the cost of salvage, gas freeing, and drydocking from the reporting criteria. This change is being made on the recommendation of the Towing Safety Advisory Committee.

The statistical summary on the following pages represents casualties to commercial vessels which met the 1980 criteria. [Statistics concerning recreational boating accidents are published separately. "Boating Statistics 1981," (COMDTINST M16754.1C), covering the calendar year 1981, can be ordered from Commandant (G-BP), U.S. Coast Guard, Washington, DC 20593.]

The summary also includes those casualties serious enough by reason of dollar damage or death/injury to personnel to warrant the convening of a Marine Board of Investigation (specifically, the collision between the U.S. Coast Guard Cutter CUYAHOGA and the Argentine M/V SANTA CRUZ on Chesapeake Bay, which occurred October 20, 1978; this collision resulted in the loss of 11 lives).

Every event involving a vessel or its personnel which meets any of the conditions of a reportable casualty is of great concern to the Coast Guard. A number of reportable casualties are not investigated by the Coast Guard

simply because they are not reported. Thus, it is of the utmost importance that the masters of all vessels ensure that all casualties are reported and investigated. With the cooperation of the masters, owners, and agents of commercial vessels, many of the unreported casualties can be investigated.

This statistical tabulation is intended to summarize the casualty experience for the entire commercial fleet. Because the summary is so all-encompassing, use of the statistics may lead to erroneous conclusions if the limitations of the data are not well understood. The Information and Analysis Staff of the Office of Merchant Marine Safety will gladly assist in quantifying those limitations for each specific need.

Comments and recommendations for changes or improvements in the statistics should be addressed to Commandant (G-MA/15), U.S. Coast Guard, Washington, DC 20593.

Abbreviations

The following abbreviations were used in the column headings for the first five charts:

Full heading	Abbreviation	Explosion and/or fire— structure, equipment, all others	Exp a/o fire: stru, equip, other
Collision: crossing, meeting, and overtaking	Coll: crossing	Grounding with damage to vessel	Gnd: damage to ves
Collision while anchored, docking, or undocking	Coll: anchored	Grounding without damage to vessel	Gnd: no damage to ves
Collision: fog	Coll: fog	Foundering, capsizing, and flooding	Foundering, cap, flood
Collision with piers and bridges	Coll: piers	Heavy weather damage	Heavy wea. damage
Collision: all others	Coll: other	Material failure—structure and equipment	Mat fail—stru & equip
Explosion and/or fire—cargo	Exp a/o fire: cargo	Material failure—machinery and engineering equipment	Mat fail—mach & eng equip
Explosion and/or fire— vessel's fuel	Exp a/o fire: ves fuel	Casualties not otherwise classified	Casualties not classified
Explosion and/or fire— pressure vessels, boilers	Exp a/o fire: pressure ves		

STATISTICAL SUMMARY OF CASUALTIES TO COMMERCIAL VESSELS

OCTOBER 1979 TO 30 SEPTEMBER 1980 FISCAL YEAR 1980																				
		Coll: crossing	Coll: anchored	Coll: fog	Coll: piers	Coll: other	Exp a/o fire: cargo	Exp a/o fire: ves fuel	Exp a/o fire: pressure ves.	Exp a/o fire: stru, equip, other	Gnd: damage to ves	Gnd: no damage to ves.	Foundering, cap & flood	Heavy wea. damage	Cargo damage	Mat fail-stru & equip	Mat fail-mach & equip	Casualties not classified	Total	
Number of casualties	385	242	7	679	418	22	22	12	241	633	936	617	6	0	394	863	261	5738		
Number of vessels involved	1109	655	15	1333	666	28	23	12	251	1177	1740	697	6	0	428	899	511	9550		
Number--inspected vessels involved	271	181	5	365	220	11	3	9	46	242	512	52	4	0	171	250	125	2467		
Number--uninspected vessels involved	838	474	10	968	446	17	20	3	205	935	1228	645	2	0	257	649	386	7083		
PRIMARY CAUSE																				
Personnel fault:																				
Pilots--state	10	11	1	20	5	0	0	0	0	8	20	0	0	0	0	1	2	78		
Pilots--federal	0	3	0	13	4	0	0	0	0	6	11	1	0	0	1	0	1	40		
Licensed officer--Documented seaman	295	131	5	492	173	2	3	2	2	285	451	36	0	0	10	8	43	1938		
Unlicensed--Undocumented persons	78	24	2	27	41	2	0	0	1	97	112	56	0	0	9	4	35	488		
All others	25	20	0	21	8	0	0	0	0	6	22	1	0	0	1	1	1	106		
Calculated risk	0	0	0	2	1	0	0	0	0	0	1	1	0	0	0	0	0	5		
Restricted maneuvering room	2	3	0	7	3	0	0	0	0	2	5	1	0	0	0	1	1	25		
Storms-adverse weather	27	9	0	24	30	0	0	0	0	51	31	66	5	0	50	7	71	371		
Unusual currents	4	3	0	11	1	0	0	0	0	3	18	7	0	0	1	0	0	52		
Sheer, suction, bank cushion	13	1	0	5	3	0	0	0	0	17	14	0	0	0	0	0	2	55		
Depth of water less than expected	3	0	0	3	11	0	0	0	0	79	199	1	0	0	0	0	0	296		
Structural failure--no personnel fault	7	2	0	6	0	0	0	0	4	4	2	71	0	0	0	6	0	141		
Failure of equipment	25	48	0	65	32	3	6	8	79	59	66	78	0	0	214	762	34	1479		
Unseaworthy--lack of maintenance	5	2	0	6	6	0	0	0	3	2	4	19	0	0	1	5	1	48		
Floating debris--submerged object	5	0	0	6	81	0	0	0	0	14	1	25	0	0	6	1	2	141		
Inadequate tug assistance	0	1	0	4	2	0	0	0	0	0	2	0	0	0	0	0	0	9		
Fault on part of other vessel/person	578	368	7	574	218	6	1	0	9	498	739	70	0	0	32	27	148	3275		
Unknown--Insufficient information	32	29	0	53	47	15	13	1	153	46	42	264	1	0	65	76	166	1003		

1 OCTOBER 1979 TO 30 SEPTEMBER 1980
FISCAL YEAR 1980

TYPE OF VESSEL	Coll: crossing	Coll: anchored	Coll: fog	Coll: piers	Coll: other	Exp a/o fire: cargo	Exp a/o fire: ves fuel	Exp a/o fire: pressure ves.	Exp a/o fire: stru, equip, other	Gnd: damage to ves	Gnd: no damage to ves.	Foundering, cap & flood	Heavy wea. damage	Cargo damage	Mat fail-stru & equip	Mat fail-mach & equip	Casualties not classified	Total	
Inspected vessels:																			
Passenger and ferry--large	1	3	0	13	3	0	0	1	2	6	8	1	0	0	6	13	3	3	60
Passenger and ferry--small	18	22	1	10	23	0	1	0	8	17	4	18	0	0	24	56	14	14	216
Freight	33	33	2	64	47	3	0	5	13	21	28	9	1	0	68	62	36	412	
Cargo barge	30	12	0	41	27	0	1	0	2	24	28	4	0	0	4	5	16	190	
Tankship	19	21	0	30	24	1	1	3	6	22	39	4	1	0	1	79	21	305	
Tank barge	156	74	1	195	69	7	0	0	9	141	392	5	0	0	9	11	26	1095	
Public	0	0	0	1	2	0	0	0	1	1	0	1	1	0	1	2	0	10	
Miscellaneous	14	16	1	11	25	0	0	0	5	10	13	10	1	0	25	22	9	162	
Uninspected vessels:																			
Fishing	147	97	4	32	79	2	8	0	118	199	193	338	0	0	169	528	83	2007	
Tug/Towing	352	142	2	537	198	4	3	0	44	332	548	135	0	0	28	38	48	2411	
Foreign	85	86	2	68	40	4	2	1	11	25	83	5	1	0	13	23	23	467	
Other	254	149	2	331	129	7	7	2	32	379	404	166	1	0	47	60	232	2202	
GROSS TONNAGE																			
300 tons or less	497	292	10	449	328	7	14	1	181	440	549	496	0	0	242	644	165	3766	
Over 300 to 1000 tons	235	109	0	425	94	5	1	1	12	463	610	81	0	0	24	34	134	2228	
Over 1000 to 10000 tons	187	114	2	269	137	10	2	2	17	182	370	17	3	0	50	50	86	1481	
Over 10000	100	86	2	131	63	2	3	8	18	51	148	10	3	0	98	133	64	920	
Other	90	54	1	59	44	4	3	0	23	41	63	93	0	0	14	38	62	496	
LENGTH																			
Less than 100 feet	453	264	7	362	250	4	16	0	164	366	488	510	0	0	222	655	358	4119	
100 to less than 300 feet	505	259	6	742	290	15	3	2	49	720	1052	148	2	0	80	66	43	3982	
300 to less than 500 feet	28	29	0	45	41	2	0	2	6	22	46	6	1	0	15	20	22	285	
500 feet and over	90	71	2	145	66	5	3	8	22	44	135	10	3	0	105	151	51	911	
Other	33	32	0	39	19	2	1	0	10	25	19	23	0	0	6	7	37	352	
AGE																			
Less than 10 years	498	259	5	534	293	10	7	4	100	517	770	183	3	0	180	324	219	3906	
10 to less than 20 years	304	178	3	366	172	5	9	1	56	348	501	158	2	0	86	198	124	2511	
20 to less than 30 years	139	86	1	217	84	3	3	5	31	154	250	130	0	0	56	110	61	1330	
30 years and over	97	82	6	151	88	6	3	2	52	114	166	158	1	0	91	248	44	1309	
Other	71	50	0	65	29	4	1	0	12	44	53	68	0	0	15	19	63	494	

1 OCTOBER 1979 TO 30 SEPTEMBER 1980
FISCAL YEAR 1980

STATISTICAL SUMMARY OF CASUALTIES TO COMMERCIAL VESSELS (Continued)

LOCATION OF CASUALTY	Coll: crossing	Coll: anchored	Coll: fog	Coll: piers	Coll: other	Exp a/o fire: cargo	Exp a/o fire: ves fuel	Exp a/o fire: pressure ves.	Exp a/o fire: stru, equip, other	Gnd: damage to ves	Gnd: no damage to ves.	Foundering, cap & flood	Heavy wea. damage	Cargo damage	Mat fail-stru & equip	Mat fail-mach & equip	Casualties not classified	Total	
Inland-Atlantic	52	45	1	110	137	3	6	1	45	117	208	97	1	0	40	93	42	998	
Inland-Gulf	150	79	2	172	148	9	6	2	44	103	177	100	0	0	13	15	32	1052	
Inland-Pacific	20	32	0	46	57	3	1	0	24	34	75	56	0	0	32	91	12	483	
Ocean-Atlantic	26	11	1	15	43	1	3	5	34	43	34	97	3	0	93	167	52	628	
Ocean-Gulf	35	20	1	5	91	0	1	1	30	22	15	42	1	0	18	11	19	312	
Ocean-Pacific	27	15	2	22	61	1	2	2	46	93	23	122	1	0	151	434	56	1057	
Great Lakes	8	1	0	44	23	1	0	0	7	19	25	5	0	0	25	28	10	199	
Western Rivers	64	31	0	247	91	2	3	0	10	197	365	96	0	0	11	12	30	1158	
Ocean-other	3	7	0	18	15	2	0	0	1	5	14	2	0	0	11	11	8	97	
Foreign waters	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	
TIME OF DAY																			
Daylight	511	317	7	760	380	16	17	8	127	440	739	354	2	0	266	637	192	4773	
Nighttime	510	286	6	482	230	11	4	4	92	640	869	267	2	0	118	194	210	3925	
Twilight	80	50	2	74	39	0	2	0	24	78	117	41	0	0	22	50	90	669	
Other	8	2	0	17	17	1	0	0	8	19	15	35	2	0	22	18	19	183	
ESTIMATED LOSSES (\$'000)																			
Vessel	24089	11500	364	16794	21885	1426	1317	398	26885	53666	894	45343	2672	0	9343	6069	15601	238216	
Cargo	1388	710	0	1721	244	749	12	0	382	2003	245	5550	790	0	399	66	838	15097	
Property	4058	7055	2	19206	3908	801	16	0	541	1339	307	916	1250	0	736	269	1963	42367	
VESSELS TOTALLY LOST																			
Inspected	2	1	0	0	3	2	1	0	3	5	0	7	0	0	2	0	3	29	
Uninspected	20	12	0	12	7	2	8	0	79	63	4	211	0	0	5	2	8	433	

STATISTICAL SUMMARY OF DEATHS/INJURIES DUE TO A VESSEL CASUALTY

1 OCTOBER 1979 TO 30 SEPTEMBER 1980
FISCAL YEAR 1980

Number of casualties	Number - inspected vessels involved	Number - uninspected vessels involved	Number of persons deceased/injured	Coll: crossing	Coll: anchored	Coll: fog	Coll: piers	Coll: other	Exp a/o fire: cargo	Exp a/o fire: ves fuel	Exp a/o fire: pressure ves.	Exp a/o fire: stru, equip, other	Gnd: damage to ves	Gnd: no damage to ves.	Foundering, cap & flood	Heavy wea. damage	Cargo damage	Mat fail-stru & equip	Mat fail-mach & equip	Casualties not classified	Total
20	1	19	13/32	2	2		9	7	7	5	1	18	3	2	47			7	4	8	140
1	1	1		1	1		2	2	4	5	5	5	3	2	5			2	3	3	28
1	1	1		1	1		7	5	3	5	13	13	3	2	42			5	1	5	112
13/32				0/1			3/14	2/12	2/8	0/9		25/54	6/1	1/12	79/23			8/11	3/3	5/10	147/180
PRIMARY CAUSE																					
Personnel fault:																					
Pilots--State																					
Pilots--Federal																					
Licensed Officer--Documented seaman																					
Unlicensed--Undocumented person																					
All other																					
Calculated risk																					
Restricted maneuvering room																					
Storms--adverse weather																					
Unusual currents																					
1																					
Sheer, suction, bank cushion																					
Depth of water less than expected																					
Failure of equipment																					
Unseaworthy--lack of Maintenance																					
Floating debris--submerged object																					
1																					
Inadequate tug assistance																					
Fault--part of other vessel or person																					
3																					
Unknown--insufficient information																					
3																					
TYPE OF VESSEL																					
Inspected vessels:																					
Passenger and ferry--large																					
0/2																					
Passenger and ferry--small																					
0/3																					
Freight																					
0/3																					
Cargo barge																					
0/1																					
Tankship																					
0/1																					
Tank barge																					
0/2																					
Public																					
0/1																					
Miscellaneous																					
0/1																					
Uninspected vessels:																					
Fishing																					
2/6																					
Tug/Towing																					
6/7																					
Foreign																					
0/4																					
0/4																					
0/11																					
0/1																					
0/2																					
0/3																					
0/3																					
0/1																					
0/2																					
0/1																					
0/1																					
0/1																					
0/5																					
1/3																					
0/2																					
1/8																					
3/1																					
3/11																					
0/2																					
0/1																					
18/31																					
2/1																					
0/2																					
44/5																					
5/5																					
1/0																					
15/13																					
0/2																					
0/1																					
3/3																					
0/1																					
0/1																					
5/1																					
0/7																					
60/28																					
14/27																					
2/6																					
44/72																					

1 OCTOBER 1979 TO 30 SEPTEMBER 1980
FISCAL YEAR 1980

PARTICULARS OF PERSON DECEASED/INJURED															Total			
	Coll: crossing	Coll: anchored	Coll: fog	Coll: piers	Coll: other	Exp a/o fire: cargo	Exp a/o fire: ves fuel	Exp a/o fire: pressure ves.	Exp a/o fire: stru, equip, other	Gnd: damage to ves	Gnd: no damage to ves.	Foundering, cap & flood	Heavy wea. damage	Cargo damage		Mat fail-stru & equip	Mat fail-mach & equip	Casualties not classified
Papers of deceased/injured: Licensed by Coast Guard	3/3	0	0	1/0	1/3	1/1	0/2	0	1/0	0	0/0	5/6	0	0	0/1	3/2	0/1	15/20
Documented by Coast Guard	0/4	0	0	0/2	0/1	0/1	0	0	1/1	0	0	2/6	0	0	0/1	0	0	3/16
No license or document	10/25	0/1	0	1/11	1/8	1/4	0/3	0	23/52	6/1	1/1	71/11	0	0	8/9	0/1	5/8	127/135
Other-unknown-foreign	0	0	0	1/1	0	0/2	0/4	0	0/1	0	0	1/0	0	0	0	0	0/1	2/9
Status or capacity on vessel: Passenger	2/3	0	0	1/9	0/1	0	0	0	0	1/0	0/1	10/1	0	0	2/0	0	0	16/15
Longshoreman-harbor worker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1/1	0	0	1/1
Crewmember	11/27	0/1	0	2/4	1/11	1/3	0/9	0	22/47	4/1	1/1	66/19	0	0	4/9	3/3	5/9	120/144
Other	0/2	0	0	1/0	0/1	1/5	0	0	3/7	1/0	0	3/3	0	0	1/1	0	0/1	10/20
Activity engaged in: Off duty	1/6	0	0	0/1	1/3	0/1	0	0	8/1	0	0	4/2	0	0	0	0	0/6	14/20
Deck department duties	8/14	0/1	0	1/3	1/4	0/1	0/2	0	2/10	0/1	1/1	22/5	0	0	1/4	0	0	36/46
Engine department duties	1/1	0	0	0	0	0	0/7	0	3/3	0	0	0/2	0	0	0	3/3	0/2	7/18
Steward department duties	0/1	0	0	0/1	0	0	0	0	0	0	0	1/0	0	0	0	0	0	1/2
Handling cargo	0	0	0	0	0	1/0	0	0	1/2	0	0	0	0	0	4/1	0	0	6/3
Fishing	0/2	0	0	0	0	0	0	0	2/0	4/0	0	20/1	0	0	0/2	0	3/0	29/15
Drills	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1/0	0	0	1/0
Passenger	2/3	0	0	1/9	0/2	0	0	0	0	1/0	0/1	6/1	0	0	0/2	0	0	10/18
Other and unknown	1/5	0	0	1/0	0/3	1/6	0	0	9/38	1/0	0	27/11	0	0	1/3	0	2/2	43/68
Location: Great Lakes	0/2	0	0	0	0	0	0	0	0/1	0	0	1/0	0	0	0	0	0	1/3
Western Rivers	3/2	0	0	2/5	1/1	0/2	0/3	0	1/0	1/0	0	5/3	0	0	0	0	0	13/16
Inland	9/15	0/1	0	0/8	1/7	2/5	0/6	0	6/13	0	1/1	29/5	0	0	6/3	0	0/7	54/71
Ocean	1/13	0	0	1/1	0/4	0/1	0	0	4/6	5/1	0/1	43/13	0	0	1/3	0/3	5/3	60/49
Foreign and unspecified	0	0	0	0	0	0	0	0	14/34	0	0	1/2	0	0	1/5	3/0	0	19/41
Part of body involved: Head, neck, shoulder	2/8	0/1	0	0/4	0/4	0/4	0	0	4/0	1/0	0	0/3	0	0	0/1	0	0	7/25
Back	0/3	0	0	0/3	0	0	0	0	0/1	0	0	0/3	0	0	0/1	0	0/1	0/12
Chest	0/3	0	0	0	0/2	0	0/1	0	0	0	0	0/1	0	0	0/1	0	0/1	0/9
Extremities	0/4	0	0	0/5	0/3	0/4	0/2	0	0/4	0	0/1	0/5	0	0	0/5	0/1	0/2	0/36
Abdomen, groin, hip	0/1	0	0	0/1	0/1	0	0	0	0	0	0	1/0	0	0	0/1	0	0	1/4
Lungs	9/0	0	0	2/0	1/0	1/0	0	0	5/0	0	0	63/0	0	0	6/0	0	5/0	97/1
Unspecified, miscellaneous	2/13	0	0	1/1	1/2	1/0	0/6	0	16/49	0	1/1	14/12	0	0	2/2	3/2	0/6	41/94

STATISTICAL REPORT OF DEATHS/INJURIES FOR A VESSEL (ANNUAL/QUARTERLY)

1 OCTOBER 1979 TO 30 SEPTEMBER 1980
FISCAL YEAR 1980

CAUSE OF DEATH	Number of deaths	Inspected vessels involved	Uninspected vessels involved	Natural cause	Homicide	Suicide	Disappearance	Slips & falls—ladders	Slips & falls—gangways	Slips & falls—on deck	Slips & falls—other	Falls from ves.—into water	Falls into holds or tanks	Struck by objects; falling, dropped or moving	Exposure & asphyxiation	Struck against, crushed, bumped into objects	Operating machinery & tools	Burns & scalds (other than electrical)	Electrical shock & burns	Caught in lines, chains or wire ropes	Pinching or crushing	Heavy weather	Overexertion, sprains & strains	Cuts, lacerations, bruises, & punctures	Altercations & misconduct	Unknown or insufficient information	Total	
Intoxication	85					3		1																			3	
Physical deficiency or handicap																											1	92
Unsafe movement or posture																											5	
Psychological—immaturity/insanity						8																					11	
Unsafe practice																											19	
Violation of law or regulation																											3	
Human errors																											1	
Decks slippery or cluttered																											60	
Weather conditions																											8	
Poor maintenance/housekeeping																											16	
Inadequate lighting																											1	
Inadequate rails or guards																											2	
Failure of equipment																											11	
Inadequate supervision																												
Inadequate life preservers																												
Inadequate tools or equip.																												
Inadequate protective equip.																												
Improper use of tools or equip.																												
Miscellaneous causes							8																				1	
Miscellaneous causes																											1	
Miscellaneous causes																											1	
Miscellaneous causes																											1	
Miscellaneous causes																											1	
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Miscellaneous causes																											1	
Miscellaneous causes																												

1 OCTOBER 1979 TO 30 SEPTEMBER 1980
FISCAL YEAR 1980

PARTICULARS OF PERSON DECEASED	1 OCTOBER 1979 TO 30 SEPTEMBER 1980 FISCAL YEAR 1980																	Total							
	Natural cause	Homicide	Suicide	Disappearance	Slips & falls--ladders	Slips & falls--gangways	Slips & falls--on deck	Slips & falls--other	Falls from ves.--into water	Falls into holds or tanks	Struck by objects; falling, dropped or moving	Exposure & asphyxiation	Struck against, crushed, bumped into objects	Operating machinery & tools	Burns & scalds (other than electrical)	Electrical shock & burns	Caught in lines, chains or wire ropes		Pinching or crushing	Heavy weather	Overexertion, sprains & strains	Cuts, lacerations, bruises, & punctures	Altercations & misconduct	Unknown or insufficient information	
Papers of deceased:	22	19	43	1	22	1	1	10	3	1	1	4	15	1	8	2	2	1	1	1	1	1	1	2	2
Licensed by Coast Guard	19	19	43	1	22	1	1	10	3	1	1	4	15	1	8	2	2	1	1	1	1	1	1	1	2
Documented by Coast Guard	43	2	10	6	1	1	1	8	5	1	28	9	2	3	2	3	1	1	1	1	1	1	1	16	16
No license or document	1	2	1	1	1	1	2	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Other--unknown--foreign	22	2	7	2	1	1	11	11	4	8	7	4	1	3	2	4	1	1	1	1	1	1	1	1	1
Status or capacity on vessel:	22	2	7	9	1	1	11	11	4	8	7	4	1	3	2	4	1	1	1	1	1	1	1	1	1
Passenger	1	2	7	9	1	1	11	11	4	8	7	4	1	3	2	4	1	1	1	1	1	1	1	1	1
Longshoreman-harbor worker	1	2	7	9	1	1	11	11	4	8	7	4	1	3	2	4	1	1	1	1	1	1	1	1	1
Crewmember	61	2	3	9	3	3	82	3	4	14	14	4	1	3	2	4	1	1	1	1	1	1	1	8	8
Other	1	1	1	1	1	1	6	6	8	8	7	4	1	3	2	4	1	1	1	1	1	1	1	1	1
Activity engaged in:	27	13	6	4	17	13	17	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Off duty	27	13	6	4	17	13	17	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Deck department duties	13	6	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Engine department duties	6	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Steward department duties	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Handling cargo	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fishing	17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Drills	13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Passenger	4	2	7	5	1	1	9	9	8	8	7	4	1	3	2	4	1	1	1	1	1	1	1	1	1
Other and unknown	13	2	7	5	1	1	9	9	8	8	7	4	1	3	2	4	1	1	1	1	1	1	1	1	1
Location:	8	4	1	3	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Great Lakes	8	4	1	3	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Western Rivers	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Inland	48	2	9	3	2	1	11	11	4	4	25	6	1	3	1	4	1	1	1	1	1	1	1	1	1
Ocean	18	1	1	3	1	1	8	8	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Foreign and unspecified	7	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Part of body involved:	2	1	2	7	3	2	105	4	2	3	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Head, neck, shoulder	2	1	2	7	3	2	105	4	2	3	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Back	2	1	2	7	3	2	105	4	2	3	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Chest	2	1	2	7	3	2	105	4	2	3	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Extremities	2	1	2	7	3	2	105	4	2	3	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Abdomen, groin, hip	2	1	2	7	3	2	105	4	2	3	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Lungs	2	1	2	7	3	2	105	4	2	3	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Unspecified, miscellaneous	83	10	1	2	3	1	4	4	2	4	11	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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STATISTICAL BUREAU OF ECONOMIC AFFAIRS OF THE GOVERNMENT OF CANADA

1 OCTOBER 1979 TO 30 SEPTEMBER 1980
FISCAL YEAR 1980

PARTICULARS OF PERSON INJURED	Natural cause	Homicide	Suicide	Disappearance	Slips & falls--ladders	Slips & falls--gangways	Slips & falls--on deck	Slips & falls--other	Falls from ves.--into water	Falls into holds or tanks	Struck by objects; falling, dropped or moving	Exposure & asphyxiation	Struck against, crushed, bumped into objects	Operating machinery & tools	Burns & scalds (other than electrical)	Electrical shock & burns	Caught in lines, chains or wire ropes	Pinching or crushing	Heavy weather	Overexertion, sprains & strains	Cuts, lacerations, bruises, & punctures	Altercations & misconduct	Unknown or insufficient information	Total
Papers of person injured:																								
Licensed by Coast Guard	2				24	1	16	21	1	3	31		20	5	18		4	6	2	18	6	6	3	167
Documented by Coast Guard	3		1		95	6	142	102	3	4	149	1	71	15	23	1	17	31	2	127	29	33	26	881
No license or document	2		2		9	1	45	47	3	6	142	3	21	19	20		42	17	62	18	1	1	15	475
Other-unknown-foreign										1	6			1										9
Status or capacity on vessel:																								
Passenger	2						11	6			1		2		1				4	4			1	27
Longshoreman-harbor worker							176	132	1	11	9	1	104	27	49		56	44	160	48	6	40	38	1281
Crewmember	5		3	120		8	16	29	5	2	68	3	6	13	11		7	10	42	6	6	5	5	227
Other			8																					
Activity engaged in:																								
Off duty	1		2		17	7	23	18	2	8	3	1	13	12	2			4	15	4	20	2	2	134
Deck department duties	1				53	1	69	71	2	152	3		49	12	13		33	12	94	23	5	10	609	
Engine department duties	1				24		34	29	1	50	5		30	15	32		1	10	38	9	5	7	289	
Steward department duties	1				17		26	9		9	9		9	1	1		1	11	14	2	3	3	104	
Handling cargo								3		7	7		2		2		22	5	1	6	6	1	1	80
Fishing	1						9			31	6		2						3	1	1			11
Drills							3		1	6	2								2	2	9	7	14	22
Passenger	1				17		30	32	1	67	2	3	7	13	11		6	12	42	9	9	7	14	276
Other and unknown	2		1																					
Location:																								
Great Lakes					4		6	8	2	2	5		6	1	4		3	4	7	3	3	1	1	50
Western Rivers					3		3	7	2	15	3		2	1	4		4	4	7	6	6	2	1	59
Inland	4		2		35	3	62	59	3	6	180	3	33	15	35		41	18	100	17	12	12	19	649
Ocean	2				47		73	47	3	2	66	1	42	12	7		9	23	42	19	9	7	11	412
Foreign and unspecified	1		1		39	5	59	49	2	2	52		29	12	11	1	6	13	51	9	18	18	12	372
PART OF BODY INVOLVED																								
Head, neck, shoulder			1		24	1	20	22	2	4	76		20	8	8		1		12	1	1	22	9	233
Back	1		1		31	2	48	27	3	7	7		8	8	3		1		94	1	5	5	1	226
Chest			2		4	3	11	6	1	5	5		15	32	3		1		75	1	1	3	3	56
Extremities					57	3	98	89	3	5	212		66		42		59	53	75	49	7	7	19	869
Abdomen, groin, hip	2				6		20	18	2	2	14		1		2				25	2	3	3	1	97
Limbs																								
Unspecified, miscellaneous	4				6	2	6	7	1	2	10	4	2		2		1				2	11	11	57

United States
Coast Guard

2100 Second St., S.W.
Washington, D.C. 20593

Official Business
Penalty for Private Use \$300

Coast Guard
DOT 514

THIRD CLASS



POSTAGE WILL BE PAID BY ADDRESSEE