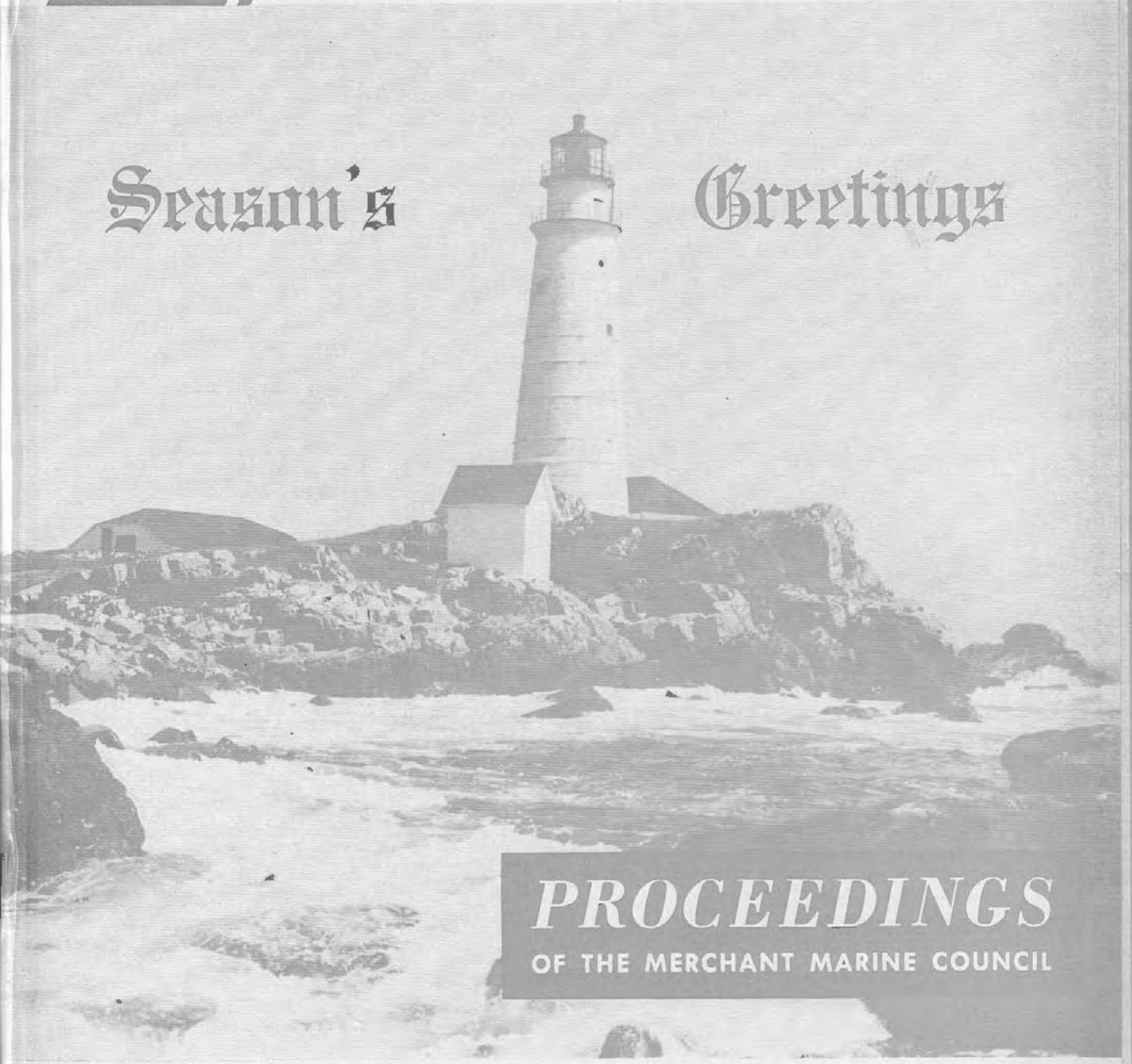
COAST GUARD



PROCEEDINGS
OF THE MERCHANT MARINE COUNCIL

Vol. 26, No. 12 CG-129 December 1969

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FEATURES

DEPARTMENTS

COVERS

FRONT COVER: Boston Light Station—America's oldest and most famous lighthouse—is 253 years old. Since September 14, 1716, it has been the scene of storms, shipwrecks, and heroic rescues. Benjamin Franklin wrote a ballad, "The Lighthouse Tragedy," about the drowning of the first keeper and his family. When the British captured the light during the Revolutionary War, George Washington sent 300 men to engage them in a bloody battle. Near these rocks Capt. James Lawrence gasped, "Don't give up the ship," before he died aboard the USS *Chesapeake,* battling HMS *Shannon* in the War of 1812. Three U.S. Coast Guardsmen live on Little Brewster Island today to tend the 2-million-candlepower light and the station.

Boston Light was designated a National Historic Landmark on May 13, 1964.

BACK COVER: Safety depends on *you.* Why not make 1970 an accident-free year? *Courtesy, National Safety Council.*

Season's Greetings

To the mariner at home and at sea I offer my best wishes for a joyous holiday, in the hope that the spirit of this season will guide him safely and peacefully through the coming year.

W. J. SMITH,
Admiral, U.S. Coast Guard,
Commandant.

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PROCEEDINGS

OF THE

MERCHANT MARINE COUNCIL

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OVERCURRENT PROTECTION ON MERCHANT VESSELS

Gordon B. Sims, Jr.
Electrical Engineering Branch, U.S. Coast Guard Headquarters

The following article on electrical overcurrent protection devices is planned to be the first of a series of articles concerning the design and use of electrical equipment aboard ship. The purpose of these articles is not to make the reader an instant electrician, and it is emphasized that unqualified personnel should not undertake the repair or adjustment of electrical equipment. Rather, the purpose is to remove some of the mystique and misconceptions concerning shipboard electrical equipment and, in particular, to instill an awareness and understanding by the operating personnel of the existence and purposes of the marine electrical regulations.

In order that these articles can be of maximum use to the industry, questions, comments, or recommendations concerning this or future articles are earnestly solicited. Correspondence should be addressed to Commandant (MMT–1), U.S. Coast Guard, Washington, D.C. 20591.

INTRODUCTION

Proper overcurrent protection is essential to the safety of any vessel that has an electrical installation. Excessive electrical currents can damage electric equipment and wiring and cause fires by overheating terminals, conductors, insulation, and equipment. Overcurrent protection is designed and selected to cut off or limit current to prevent any dangerous overheating.

DEFINITIONS

There are several terms related to overcurrent protection that are often misunderstood. To prevent confusion these terms will be defined. They are: Overcurrent, overload, fault current, and short circuit.

OVERCURRENT

The term "overcurrent" means just what it says. An overcurrent in a circuit or device means that that electrical current is in excess of the maximum normal or rated current. There are innumerable causes of overcurrent which result in overheating. The conductors in a circuit may be too small to carry the rated current of the connected load. Motors may be misapplied—a 10-horsepower motor may be driving a 12-horsepower load—resulting in a current that exceeds the nameplate current rating of the motor. Motors may be overloaded or stalled because of bearing failure or malfunctions of the driven machinery. Light bulbs of too high wattage may be installed in lighting fixtures. Short circuits or grounds may occur, increasing the current in the circuit above normal.

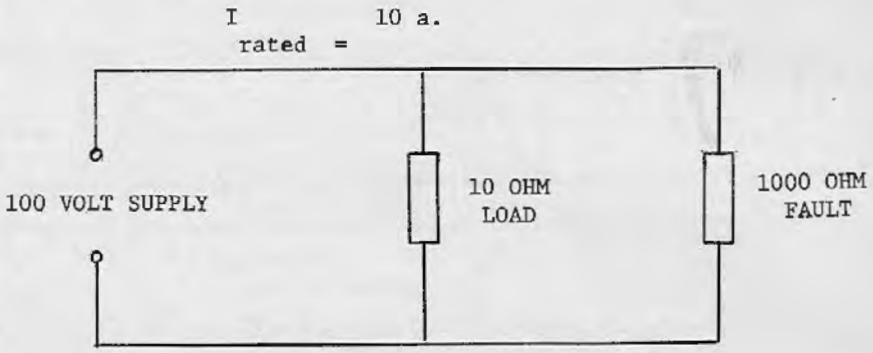


Figure 1

OVERLOAD

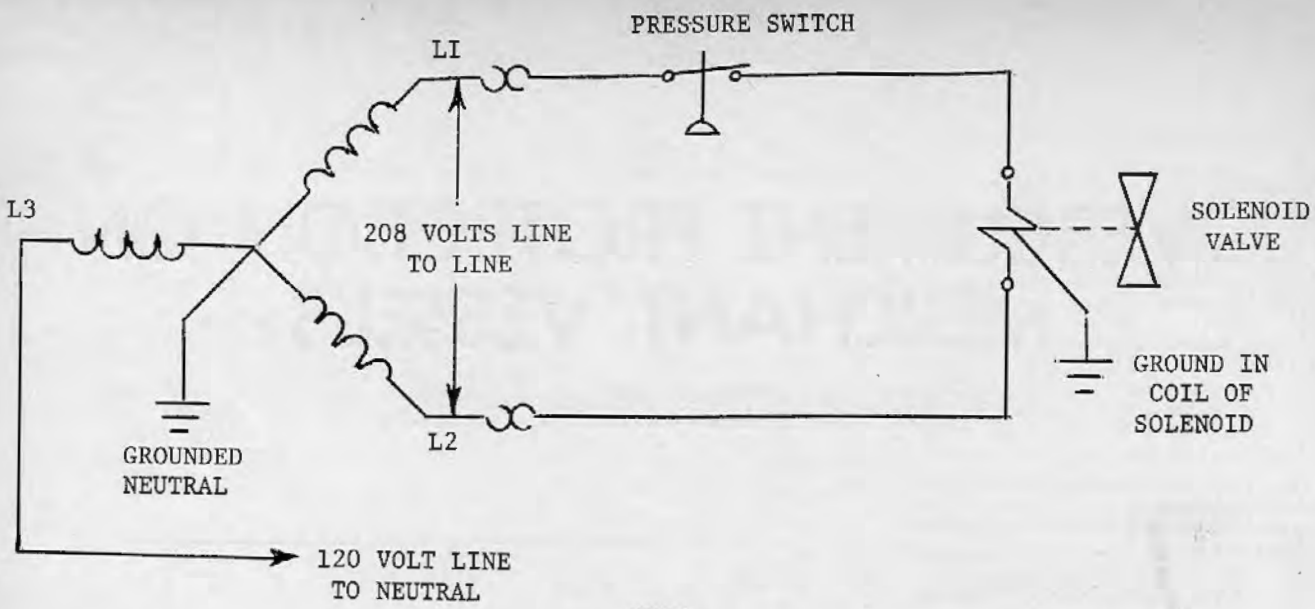
The term "overload" when applied to current is synonymous with overcurrent.

FAULT CURRENT

"Fault current" is the current that flows in a circuit due to a breakdown in the electrical insulation or the connecting of current carrying parts which results in an unintentional conducting path between points in the circuit of different potential. A completion of the electrical circuit between an energized part and a point at zero or ground potential is called a "ground." The resistance or impedance of the fault to current flow can range from very high values (with low fault currents) to very low values (with high fault currents). In *Figure 1* the fault current resulting from the resistance connections between parts of opposite polarity is only 0.1 ampere. However, if the fault was one of low resistance, say 0.1 ohm, the fault current would be 1,000 amperes.

SHORT CIRCUIT

A "short circuit" is a fault between parts of opposite polarity that has no



NOTES

1. **The pressure switch has normally closed contacts that open on high pressure.**
2. **The 208-volt solenoid will hold in at 50 percent rated voltage.**
3. **With the solenoid grounded at the midpoint of the coil, voltage is applied to the coil from L2 through the ground to the neutral ground.**

Figure 2

appreciable resistance or impedance to limit current flow. For example, one method used to calculate the maximum short circuit current that will flow at a main switchboard assumes that the bus bars are bolted together so there is zero resistance between opposite sides of the line. Under this shorted condition "short circuit" current flows from the electrical distribution system through the bus bars of the switchboard through the bolted fault.

A short circuit does not necessarily have to be from line to line. A short circuit can occur at any point in the circuit. An example of this is indicated by *Figure 2*. The coil of a solenoid valve is shorted to one side of the line from a point midway between the turns. This short circuit is sometimes called a ground. In the example shown, the short circuit shorts out, or bypasses, the contact of the pressure switch in series with the coil. In this condition 50 percent of line voltage is applied to the coil. Many coils will hold in with 50 percent voltage applied or even less. This type of shorting has resulted in many casualties. To get around this possibility, control circuits whose malfunctions could produce a hazardous coodition should always be wired as shown in *Figure 3*. Power is supplied to the circuit through an isolation transformer and one side of the secondary circuit is grounded. All coils are connected between this grounded side of the secondary and any operating contacts. All overcurrent devices, switches, and contacts are connected in the ungrounded or hot side of the circuit. When wired in this manner, any contacts that open the hot line will deenergize a grounded coil.

A notable example of a casualty which resulted from a coil being incorrectly located in the circuit occurred in New York City a few years ago. A series of malfunctions caused a boiler explosion which killed 23 people and heavily damaged the building in which the boiler was installed. The boiler was provided with an automatic combustinn system. Included as a safety device was a high pressure switch in the electrical circuit to the fuel supply valve. In case of abnormally high steam pressure the switch was supposed to operate to deenergize the fuel valve to shut off the fuel supply to the burner. Due to malfunctions of the combustion system the steam pressure began to rise abnormally high. The pressure switch opened at the proper pressure, but the valve did not close because the coil was grounded and held in at reduced voltage. The safety valve also failed to operate and the boiler eventually exploded. The circuit was essentially the same as that shown in *Figure 2*.

OVERCURRENT PROTECTIVE DEVICES

Overcurrent protective devices contain current-sensitive elements that will interrupt the current if certain specified values of current are exceeded for a specific period of time. The overcurrent device must be able to withstand arcing and mechanical stress associated with large fault currents. The interrupting action of these devices must not be a source of injury to personnel. Overcurrent devices are usually designed to carry, indefinitely, loads of approximately

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110 percent of continuous rated current. Very large overloads such as 10 times rated current will cause the device to operate almost instantly. The two most widely used overcurrent protective devices are fuses and circuit breakers. Both of these devices have certain features that enable them to provide the desired protection in the electrical distribution system.

As overcurrent devices have thermal sensitive elements, the ambient conditions where the devices are installed will affect the ability of the devices to perform in the intended manner. High ambient temperature, obstruction of air circulation, accumulation of dust, and loose contacts will reduce the current value at which overcurrent devices will function. These factors should be taken into consideration when overcurrent devices are operating for no apparent reason; but here again, the overcurrent devices should not be replaced or tampered with to give higher trip settings.

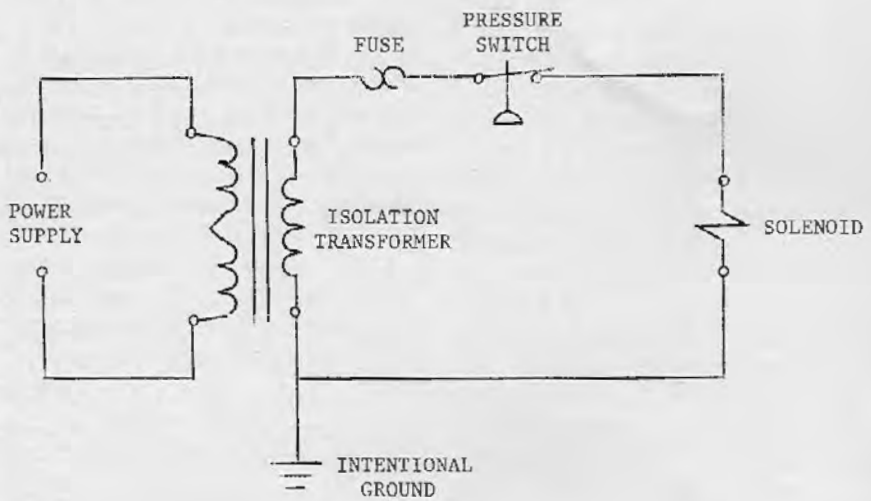
FUSES

Fuses are thermal type protective devices. They are inherently simple in design with no moving parts. The fuse consists of a conductor that will readily melt or "blow" at a specified temperature and a container to hold the meltable element and provide current carrying connecting surfaces. The connnecting surfaces are used to plug the fuse into the electrical circuit. The fusible element has a very low resistance to current; however, it does act as a source of heat when current flows through it.

The heat loss in watts in the fuse element is proportioned to the square of the current multiplied by the resistance of the fuse element. The approximate resistance of an ordinary cartridge fuse rated at 30 amperes is 0.0043 ohm. If 30 amperes are being conducted by the fuse element, the heat produced is approximately 3.6 watts. Compare this with the heat produced by the lamp in the common 2-cell flashlight, which is approximately 0.5 watt. The resistance of a 200-ampere-cartridge fuse is approximately 0.0005 ohm. With rated current flowing through the element the heat produced is approximately 20 watts. This compares roughly with the heat produced by a 25-watt household lamp. It is apparent that the heat generated by the fuse element is significant.

At rated load the fusible conductor or element of the fuse will be at a temperature slightly below its melting point. In this condition the heat from the fusible element is being removed from the fuse and the temperature of the element is stable. If the load is increased above rated, the heat input will exceed the heat removal rate; the temperature of the element will increase; and eventually the element will melt. Of course, the higher the current above rated, the quicker the element will "blow" because the heat is proportional to the square of the current. If you double the current, the heat goes up four times. In our 30-amp fuse above, 60 amps cause the heat to go from 3.6 to 14.4 watts.

Another important feature of fuses is their ability to interrupt currents many times their rated value. Fuses rated at currents up to 600 amperes are tested by Underwriters' Laboratories, Inc. in a circuit where 10,000 amperes are available under short circuit conditions. Of course, fuses should not be used where the available short circuit current is in excess of the interrupting rating of the fuse. If fuses are installed where the interrupting rating is exceeded and a short circuit occurs, the fuse element would melt, but the current would arc across the fuse terminals and the cur-



NOTES

1. Fuse in the hot line only.
2. A ground in the hot line will blow the fuse. A ground in the grounded line will have no effect.
3. A ground in the solenoid may or may not cause the fuse to blow or the solenoid to drop out.

Figure 3

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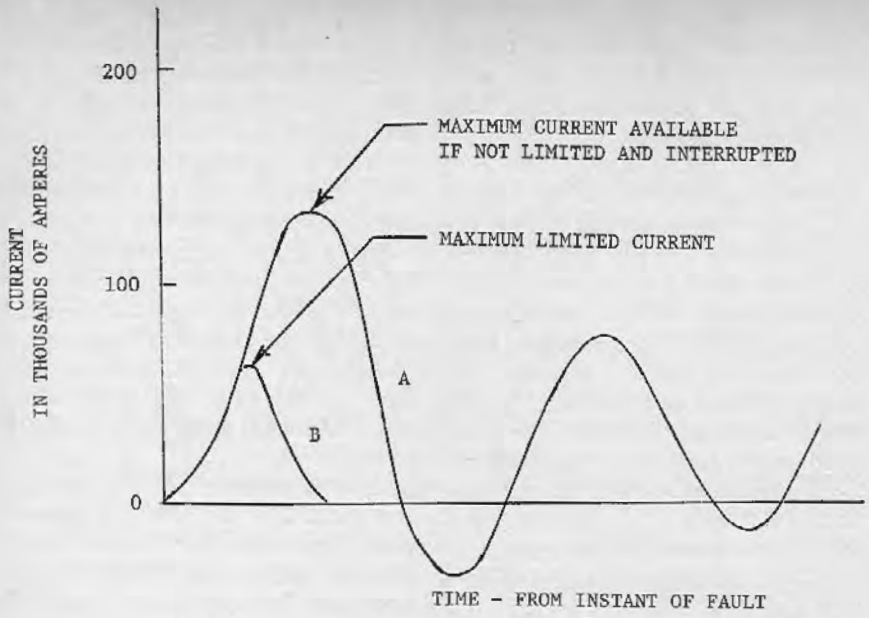


NOTES

1. **Curve A indicates the Fault Current in a circuit protected by a conventional fuse.**
2. **Curve B indicates the Fault Current in a circuit protected by a current-limiting fuse.**

Figure 4

rent would not be interrupted. The fuse would not perform its intended function.

While the most important rating for fuses is amperes, they are also rated for voltage. The voltage rating depends in part upon the clearance between the contacts, as these become opposite polarity when a fuse blows. The National Electric Code limits plug fuses for use in circuits not exceeding 125 volts between conductors and in circuits supplied from a grounded neutral system with no conductors operating at more than 150 volts to ground. Plug fuses are rated at 0 to 30 amperes. Cartridge fuses are rated at 250 volts, 600 volts, and larger. The standard 0 to 30 amperes 250-volt cartridge fuse is 2 inches long, while the comparable 600 volts fuse is 5 inches long. As the current rating of either the 250 volts or 600 volts fuses increases, the length and the diameter of the tube increases accordingly. The 600 volts fuse of any current rating is always 3 inches longer than the corresponding 250 volts fuse except for the 35 to 60 amperes 600-volt cartridge fuse which is 2½ inches longer than the comparable 250 volts fuse. The standard 1,000 amperes 200 volts fuse is 12⅝ inches long with a tube diameter of 3½ inches.

A variation of the standard fuse described above is the dual element or "slow blow" fuse. These fuses will not blow when subjected to momentary overloads that would blow the conventional fuse. One of the main applications of these fuses is in circuits where motors are started. The momentary high starting current will not blow the fuse. For small overloads and for short circuit currents the blowing time of the "slow blow" fuse is the same as that of the ordinary fuse. Some comparisons between the dual element and ordinary fuses are as follows: For 125 percent rated current the blowing time is the same; for 200 percent rated current the time delay for the dual element is six times that of the ordinary fuse; and for 500 percent rated load the timelag for the dual element is 40 times that of the ordinary fuse. Although the timelag for dual element fuses is very great, it is pointed out that the blowing time for both the standard and dual element fuse is very short when the overload is large. For a 500-percent load the blowing times for the standard and dual element fuses are 0.25 and 10.6 seconds, respectively.

The two elements of a dual element fuse are the fuse link and the thermal cutout. The fuse link provides protection from short circuit currents and under short circuit conditions it will blow in the same manner as the element in the ordinary fuse. The thermal cutout operates from the heat of overloads. The thermal element has a mass of copper which can store a certain amount of heat that delays the temperature rise of the element when overcurrent flows through the element. This delay in the temperature rise of the element provides the timelag in blowing.

Fuses can also be designed to be what is referred to as "current limiting." Such fuses do not permit the short-circuit current to reach full available value. They blow in less than one-half cycle after a fault as the current is increasing toward the maximum. Maximum fault current would occur at one-half cycle if it was not limited.

Figure 4 illustrates the current limiting ability of an 800-ampere continuous rated current-limiting fuse. In the case illustrated the maximum instantaneous fault current available at the point in the electrical system where the fuse is applied is assumed to be 170,000 amperes. The 800-ampere fuse will limit the instantaneous fault current to 56,000 amperes. This is only 33 percent of the available fault current and is a significant reduction.

Current-limiting fuses are rated as high as 200,000 amperes. An important application of current-limiting fuses is in conjunction with circuit breakers where the fault current available would otherwise exceed the

interrupting rating of the circuit breaker.

The current-limiting cartridge fuses are similar in construction to conventional cartridge fuses. They usually are comprised of a silver fusible element enclosed in a tube. The void inside the tube is filled with silica sand. If a high current (several times rated current or more) flows through the fuse, the silver element will melt. The melting of the element will be accompanied by arcing which will vaporize some of the silver of the element. In a conventional fuse the silver vapor would conduct current; however, in the current-limiting fuse the silver vapor will combine with the silica sand to produce a high resistance compound. The increased resistance results in increased heat dissipation inside the fuse that vaporizes more silver. This additional vaporized silver combines with more silica to further increase the resistance of the current path in the fuse. This increasing resistance acts to quench the arc and terminate the current. See *Figure 4*.

CIRCUIT BREAKERS

Circuit breakers are very versatile devices that are highly reliable and require little maintenance. They are widely used on merchant vessels, primarily as overcurrent devices; however, they are often used as a switch with no automatic features. Auxiliary devices can be used with the circuit breaker to perform additional functions such as tripping on reverse power or low voltage, automatic switching, and interlocking of circuits. Circuit breakers have an additional advantage over fuses in that they can perform their assigned task (opening the circuit or clearing faults) many times without damage and without requiring maintenance.

A circuit breaker is defined as a device for interrupting a circuit between separable contacts under normal or abnormal conditions. As stated previously, a circuit breaker is basically a switch with special features to provide versatility. Circuit breakers used aboard ships are usually "air" circuit breakers. These are circuit breakers in which the contacts operate in air. In most cases circuit breakers are of the "molded case" type, which are breakers with the contacts and other operating mechanisms assembled as an integral unit in an enclosing and supporting housing of insulating material.

Circuit breakers are rated for voltage and current. There are three basic current ratings for each breaker. These are:

1. *Rated continuous current.*—This is the stated limit in amperes which a circuit breaker will carry continuously under normal conditions without tripping or overheating.

2. *Frame size.*—This is the term applied to circuit breakers of a similar group which have the same dimensions and which are usually interchangeable with each other. The frame size expressed in amperes designates the maximum continuous current rating for all parts except the trip devices.

3. *Interrupting rating.*—This is the highest current at a specified operating voltage which the circuit breaker is capable of interrupting.

To illustrate the three basic current ratings consider the application of a circuit breaker in a 450-volt distribution system where the rated load is 15 amperes and the available fault current is 12,000 amperes. A readily available circuit breaker with a 15-ampere rating is the 100-ampere frame size. It is available with an interrupting rating of 15,000 amperes when applied at 480 volts.

There are two important definitions concerning the tripping feature of circuit breakers which should be noted: They are:

1. *Instantaneous trip.*—The feature is usually provided by a magnetic device that will operate or "pick up" to trip the breaker when a predetermined value of overload current passes through the breaker. This feature is designed so that it will not be actuated except for very high overload current such as would result from short circuits.

2. *Delay trip.*—This is usually a thermal-type device that functions from the heat generated by current passing through a heating element. It is designed to provide an intentional time delay before tripping from overloads. The length of the time delay is usually inversely proportional to the magnitude of the current, that is, the higher the current the shorter the time delay. The delayed feature prevents the circuit breaker from tripping because of harmless, momentary overloads such as occur during motor starting, but will permit tripping if the overload persists.

There is one other feature that is required for circuit breakers on merchant vessels that should be mentioned. That feature is the "trip free" mechanism. A circuit breaker is trip free when the tripping mechanism can trip it even though the operating handle or mechanism is held in the closed position.

CONSTRUCTION

A typical molded case circuit breaker is shown in *Figure 5*. The external appearance is simple; however, internally a circuit breaker is a complex device. Although the main mechanism is a snap action toggle switch, trip features, arc chutes, bus work, and terminals contribute to the complexity of a circuit breaker. The circuit breaker case provides the enclosure and the means of support-

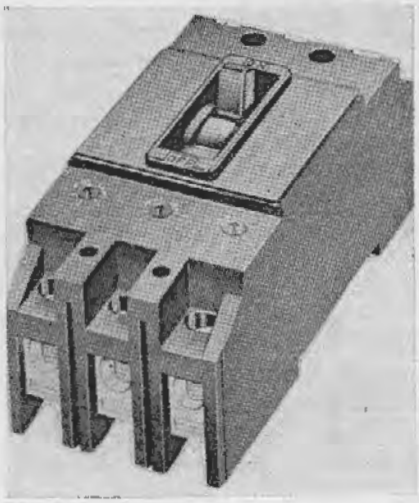


Figure 5

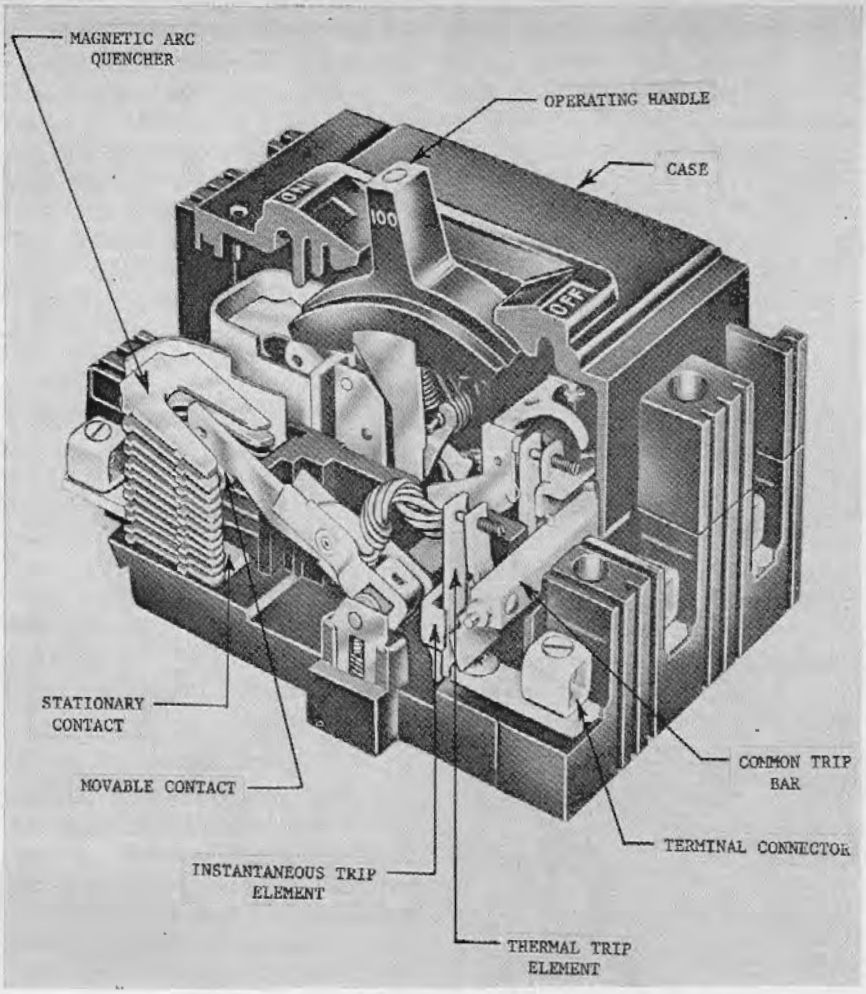


Figure 6

ing the various breaker components. It also provides the electrical insulation between components of different polarity. The case must be made of strong, durable, nonporous, insulating material that will resist warping and burning due to heating, and arcing, and must have the mechanical strength to withstand the stresses that result from high currents.

DETAILS OF CONSTRUCTION

The main internal components are shown in the section view of the circuit breaker, *Figure 6*. These parts must be corrosion resistant and must withstand high temperatures without distortion or loss of temper. Referring to *Figure 6* the major parts are as follows:

1. Toggle switch mechanism provides quick make and break action of the current carrying contacts when the handle is actuated or when the trip mechanism functions.

2. Contacts—Corrosion-resistant alloy that will provide long life and low contact resistance. Silver is often used.

3. Arc chute—Helps to extinguish the arc between the contacts and thereby increases the interrupting capacity. The arc chute does this by elongating the arc and then splitting it into segments and by absorbing the heat contained in the arc.

4. Thermal trip device—Provides time delay tripping due to overloads. Operates on an inverse time principle.

5. Magnetic trip device—Provides for instantaneous tripping due to short circuits.

6. Common tripping bar—Provides for the opening of all poles simultaneously regardless of which phase initiates the trip.

7. Operating handle—Used to close or open the breaker manually. Handle indicates by its position whether breaker is "closed," "open," or "tripped."

OPERATION

The basic components of a circuit breaker are shown in *Figure 7*. The circuit breaker is shown in an open position and in a nontripped condition. The trip-free feature is not illustrated.

Figure 8 indicates a closed circuit breaker carrying rated current or less. The breaker contacts are closed against spring pressure and are latched closed. Line current passes through the contacts, the coil of the electromagnet of the instantaneous trip device, and the heater of the thermal trip device.

You can see from *Figure 8* that the heat from the heater element of the thermal trip device has caused the bimetallic strip to deflect. At rated or less current the temperature of the bimetallic strip will not go above a certain point. The resulting deflection will not cause the breaker to trip. However, when line current exceeds rated values, the heat from the heater element will cause the bimetallic strip to deflect enough to trip the breaker. It is evident from *Figure 8* that the deflecting bimetallic strip causes the breaker to trip by rotating the common trip bar, which releases the latch. This will permit the springs to open the breaker contacts.

The instantaneous trip feature of the circuit breaker is provided by the electromagnet. See *Figure 8*. If the line current reaches a certain value so rapidly that the thermal trip device has had insufficient time to trip the

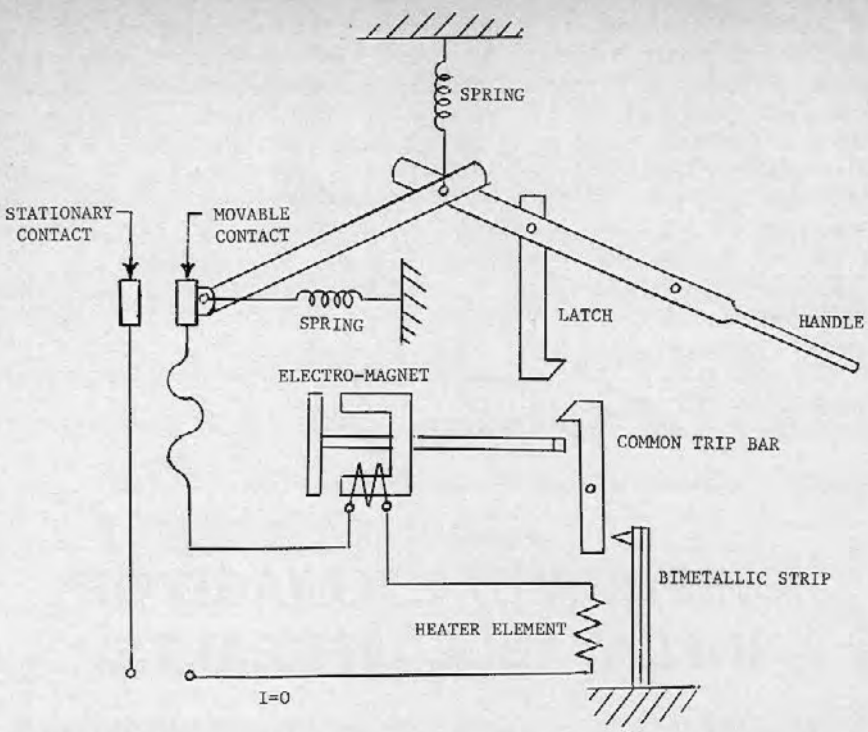


Figure 7

breaker, the electromagnet will pick up its armature. The motion of the armature will rotate the common trip bar. The rotation of the common trip bar will release the latch permitting the breaker contacts to open. It is evident from *Figure 8* that the thermal and instantaneous trip features are independent.

By referring to *Figure 8* other important features of circuit breakers can be explained. The low voltage trip feature would consist of a solenoid acting to hold the common trip bar in the latched position when energized against a spring pressure that is tending to move the common trip bar to the unlatched position. If the solenoid is deenergized, the breaker will trip. A shunt trip feature would be similar, only the action of the solenoid and spring is reversed from that of the low voltage trip. A spring holds the common trip bar in the latched position. A solenoid, when energized, would overcome the pull of the spring and move the common trip bar to the unlatched position, thereby opening the circuit breaker.

SPECIFIC DETAILS CONCERNING INSTALLATION OF OVERCURRENT DEVICES

Because of the important protection provided by overcurrent devices, each one should be examined to determine that it is rated and located in accordance with an approved drawing. The following details should be determined:

1. An overcurrent protective element should be provided for each ungrounded conductor of branch and feeder circuits.

2. Overcurrent protection should not be provided for any grounded conductor unless the overload device opens all conductors of the circuit simultaneously or as permitted for motor running protection under special conditions.

3. Overcurrent devices shall be located at the point where the conductor to be protected receives its supply (there are certain exceptions).

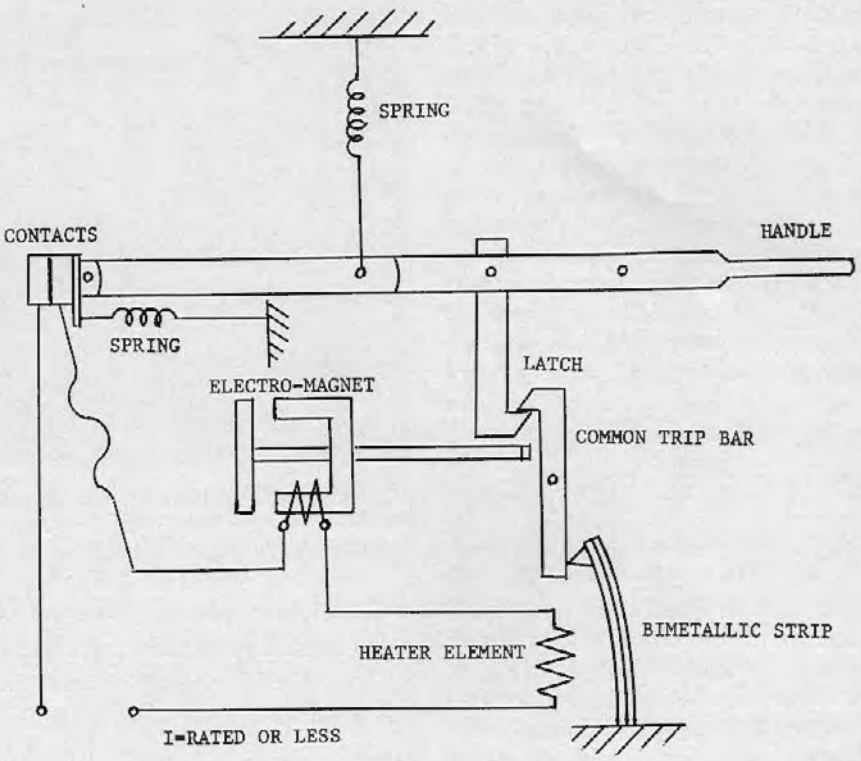


Figure 8

4. Disconnecting means should be provided on the supply side of and adjacent to all fuses.

5. All fuses shall be listed or labeled by the Underwriters' Laboratories, Inc.

6. Plug fuses of the Edison type base and renewable link cartridge type fuses shall not be used.

7. Circuit breakers and fuses shall be marked with their rating. The rating of circuit breakers shall be visible after installation.

8. Molded case circuit breakers shall be removable from the front of switchboards without having to disconnect any electrical connections.

SUMMARY

It is hoped that the reader now has a better understanding of overcurrent protection and associated devices. Correctly applied overcurrent protection can prevent machinery breakdown, cable failure, switchboard and generator damage, and electrical fires.

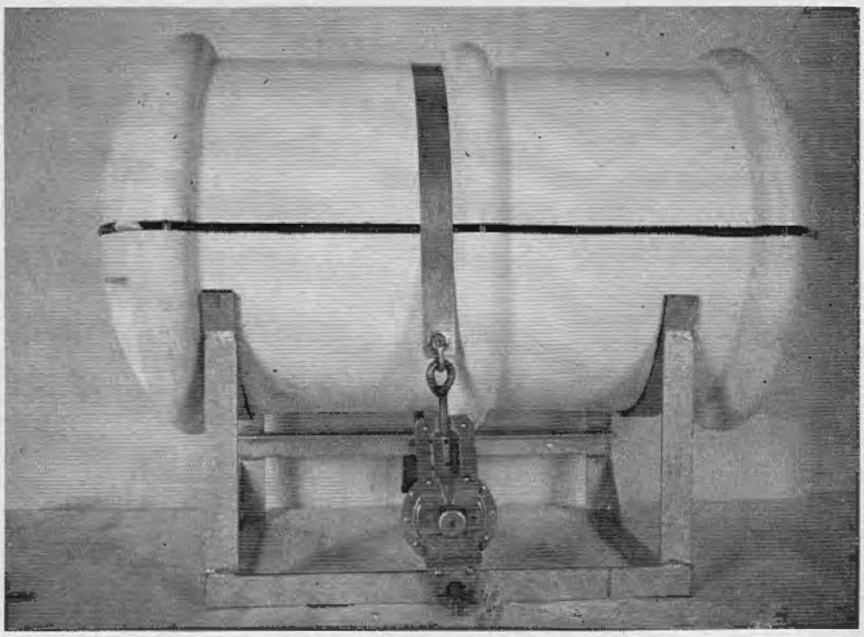
It should be understood that circuit breaker settings should never be changed unless it has been determined that the setting was incorrect. Similarly, fuses should never be replaced with ones of higher ratings than those shown on approved drawings.

There is a delicate relationship concerning the electrical load supplied by a circuit, conductor size, and overcurrent protection. Before the load on a circuit is increased, all aspects involved should be thoroughly investigated and carefully analyzed to determine if any conditions or components will be overloaded. Do not increase the load on a circuit with the intention of requiring the overcurrent device to prevent overheating; it will, but the overloaded circuit will cause routine or nuisance operation of the overcurrent device. An unwary operator may be inclined to replace the fuse with a higher rated one or adjust the circuit breaker to a higher setting to eliminate this nuisance. This could produce a dangerous situation.

Properly sized and installed overcurrent protection devices will never operate to open the circuit if conditions are normal. Thus, if one does operate, it is a clarion warning that something is wrong. The trouble can not possibly be corrected by tampering with the rating or setting of the overcurrent device. The cause is elsewhere, and it should be located and corrected. Overcurrent devices are intended to act as safety devices, not as normal operational devices.

Overcurrent devices may be installed for years before being required to perform the designed overcurrent protection function; yet they must perform this function accurately and reliably when called upon to do so. Because of the vital role that overcurrent protective devices play in the electrical installations, it is imperative that they receive the necessary attention and maintenance to insure that they will perform satisfactorily. Properly engineered, installed, and maintained overcurrent protective devices will provide for the degree of protection intended and help provide for the overall safety of the merchant vessel. ⚓

SHIPBOARD STOWAGE OF INFLATABLE LIFERAFTS



A TYPICAL RIGID CONTAINER for an inflatable liferaft, properly stowed. Not visible here are the container's drain holes, which must face downward to prevent water damage to the raft.

The rigid container for an inflatable liferaft is required to have drain holes in the lower half of its shell. Several rafts recently inspected in the Pacific were found to be damaged from water that entered while the containers were stowed with these drain holes facing upward. All merchant seamen responsible for this equipment are requested to note that when the rafts are stowed correctly, their container drain holes will be facing downward towards the deck. ⚓

THE FIRST STEP—REVISED LICENSING PROGRAM

CDR R. E. Anderson
Chief, Seamen Occupational Standards and Analysis Branch, Headquarters

A U.S. Coast Guard-sponsored study of its licensing requirements and procedures contained many recommendations to improve and update the license examination program. The article "Licensing—A Program for the Seventies" published in the May issue of the *Proceedings of the Merchant Marine Council* discussed possible changes in the licensing program as a result of this study.

Plans are now underway to implement some of the study recommendations, and the Coast Guard intends to introduce an entirely new concept of merchant marine licensing in 1972. The new concept will modernize procedures while in no way diminishing the pride and prestige associated with the holding of a license.

A primary consideration in revising the license examination program will be to insure that the examination specifications are up-to-date, reflecting the knowledge and skills required of the licensed officer to safely perform his duties on a modern merchant marine vessel.

A major change will be the conversion of present essay-type examinations to multiple-choice questions. All questions will be pretested to insure high quality, and the examinations will take on a new look. They will consist of booklets, with each booklet representing a certain section of the examination. A set time limit will be established for the completion of each segment. These new features are expected to reduce the time required to complete the examination.

The Coast Guard is awarding a contract to the Educational Testing Service (ETS) of Princeton, N.J., a recognized authority in test development and research, to develop examination specifications and assist in establishing an effective and efficient testing program. Each new question for the examinations will be edited by the staff of ETS to insure high quality.

The first definite step toward modernizing the licensing program occurred in October, when the Coast Guard sponsored a conference attended by a variety of representatives from the maritime field. The primary objective of this meeting was to seek the active participation and cooperation of these representatives, for their asssistance will be a vital factor in developing a licensing program of high quality.

The conference was attended by representatives of the following:

American Institute of Merchant Shipping
Brotherhood of Marine Officers
Educational Testing Service
International Organization of Masters, Mates, and Pilots
Lake Carriers' Association
Marine Engineers' Beneficial Association, District 2
National Marine Engineers' Beneficial Association
State University of New York Maritime College
U.S. Maritime Administration
U.S. Naval Oceanographic Office
U.S. Coast Guard ⚓

WHAT'S YOUR ATTITUDE?

People have attitudes toward almost everything—people, things, situations, ideas, and activities. So it is no surprise that they have attitudes about safety or safety performance on their jobs. Unfortunately, attitudes are not always those that lead to safe job performance. What people do in any situation depends on their attitude. The right safety attitude is *positive;* that is, it *makes a man act safely.*

Let's take a look at some work situations to show the importance of a positive safety attitude. Suppose an employee is doing a particular job and finds out he does not have the correct tool for the next step of the job. He has two choices: (1) He can get the correct tool or (2) he can use any other tool he has at hand. The employee with a positive safety attitude *will get the right tool.* Or, another employee's job requires him to work above floor level. Again he has two choices: (1) He can use a proper ladder or (2) he can stand on a nearby pipe. The man with a positive safety attitude *will use a ladder* to provide a safer place from which to work.

The same thing applies off the job: A person with a positive safety attitude will use his automobile seat belt—one with a negative attitude *won't bother.*

Strongly fixed attitudes are hard to change, *but it can be done.* Probably the most effective way to change attitudes is having the man in charge of the work setting the right example. He proves he wants a safe operation not only in what he says, but *more importantly,* in what he does. This means abiding by all safety rules and safe practices, always wearing hard hats and other personal protective equipment, and, particularly, accepting supervisory safety responsibilities with enthusiasm. Your men will not accept their responsibilities unless you accept yours. ⚓

Courtesy American Mail Line Ltd.

STATISTICAL SUMMARY OF CASUALTIES TO COMMERCIAL VESSELS [1]

1 July 1968, to 30 June 1969
Fiscal year 1969

	Nature of casualty																	
	Collisions; crossings, meeting, and overtaking	Collisions, while anchored, docking, or undocking	Collision, fog	Collisions with piers and bridges	Collisions, all others	Explosion and/or fires—cargo	Explosions and/or fires—vessel's fuel	Explosion and/or fire—boilers, pressure vessel	Explosion and/or fire—structure, equipment—all others	Grounding with damage	Grounding without damage	Founderings, capsizings, and floodings	Heavy weather damage	Cargo damage	Material failure—structure and equipment	Material failure—machinery and engineering equipment	Casualty not otherwise classified	Total
Number of casualties	233	194	21	389	272	30	27	13	147	352	215	250	54	4	149	273	61	2,684
Number of vessels involved	746	494	57	649	390	36	30	14	152	454	236	305	58	4	157	274	127	4,183
Number of inspected vessels involved	244	181	23	277	178	24	4	12	48	143	138	33	46	4	118	233	48	1,754
Number uninspected vessels involved	502	313	34	372	212	12	26	2	104	311	98	272	12	.....	39	41	79	2,429
PRIMARY CAUSE	Number of vessels																	
Personnel fault:																		
Pilots—State	13	13	.....	16	7	.....	.....	.....	.....	9	14	1	.....	.....	.....	.....	1	74
Pilots—Federal	3	6	1	7	5	.....	.....	.....	.....	5	9	.....	.....	.....	.....	.....	.....	36
Licensed officer—documented seaman	58	22	20	69	27	3	2	8	9	58	32	14	.....	1	8	30	4	365
Unlicensed-undocumented persons	140	50	13	87	44	4	4	.....	8	113	41	30	.....	.....	4	.....	4	541
All others	33	20	2	18	8	9	2	.....	14	11	18	12	.....	1	10	4	15	177
Calculated risk	10	29	.....	31	17	.....	.....	.....	.....	17	16	3	.....	.....	1	.....	.....	124
Restricted maneuvering room	6	7	.....	12	1	.....	.....	.....	.....	3	3	.....	.....	.....	.....	.....	.....	32
Storms—adverse weather	3	23	.....	35	18	.....	.....	.....	.....	32	18	44	46	2	21	6	5	253
Unusual currents	4	2	.....	27	2	.....	.....	.....	.....	3	2	5	.....	.....	.....	.....	1	46
Sheer, suction, bank cushion	27	6	.....	7	2	.....	.....	.....	.....	5	4	1	.....	.....	.....	.....	5	57
Depth of water less than expected	.....	.....	.....	10	13	.....	.....	.....	.....	23	28	2	.....	.....	.....	.....	.....	76
Failure of equipment	12	21	.....	42	20	3	16	6	62	65	17	37	9	.....	83	210	7	610
Unseaworthy—lack of maintenance	.....	2	.....	.....	.....	.....	2	.....	8	5	.....	84	1	.....	13	17	1	133
Floating debris—submerged object	.....	2	.....	6	114	.....	.....	.....	3	6	.....	11	.....	.....	7	1	1	151
Inadequate tug assistance	3	6	.....	39	6	.....	.....	.....	.....	2	5	.....	1	.....	.....	.....	1	63
Fault on part of other vessel or person	430	284	21	241	102	4	2	.....	7	92	26	53	1	.....	5	2	63	1,333
Unknown—insufficient information	4	1	.....	2	4	13	2	.....	41	6	3	8	.....	.....	5	4	19	112
ADDITIONAL CONTRIBUTING FACTORS TO CAUSE OF CASUALTY																		
Hull and associated parts:																		
Plates and framing—steel	12	19	.....	8	40	.....	.....	.....	3	23	1	37	5	.....	32	.....	9	189
Planks and framing—wood	3	4	.....	2	27	.....	.....	.....	3	18	.....	51	2	.....	8	.....	1	119
Tanks	.....	1	.....	2	6	4	1	.....	2	4	.....	7	1	1	19	5	.....	53
Holds and hatches	1	.....	.....	.....	1	5	.....	.....	.....	.....	.....	6	.....	.....	2	.....	1	16
Superstructure—bulkheads, decks	1	3	.....	3	6	1	.....	.....	11	3	.....	14	8	.....	10	.....	3	63
Ladders, gangways, rails and guards	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	3	.....	2	.....	.....	6
Masts, booms and cargo gear	.....	2	.....	1	2	.....	.....	.....	.....	.....	.....	.....	6	.....	23	.....	3	37
Rudder and stern tube	.....	.....	.....	2	9	.....	.....	.....	.....	11	.....	7	1	.....	8	6	.....	44
Watertight closures	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	26	.....	.....	.....	1	.....	28
Quarters and living spaces	.....	.....	.....	.....	.....	.....	1	.....	15	.....	.....	1	.....	.....	.....	.....	1	18
Navigation and safety:																		
Lookout	73	23	8	7	18	.....	.....	.....	.....	13	.....	.....	.....	.....	.....	.....	.....	142
Docks-piers—congested area	14	64	1	230	14	.....	.....	.....	2	9	16	2	.....	.....	.....	.....	2	354
Channels—restricted areas	161	33	5	37	32	.....	.....	.....	.....	90	86	6	.....	.....	1	.....	6	457
Buoys—aids to navigation	1	.....	.....	1	13	.....	.....	.....	.....	17	15	.....	.....	.....	.....	.....	.....	47
Excessive speed	61	29	21	25	8	.....	.....	.....	.....	11	3	5	1	1	.....	.....	.....	165
Poor visibility	11	12	10	6	15	.....	1	.....	.....	29	16	2	.....	.....	.....	.....	.....	102
Steering gear	17	11	.....	13	7	.....	.....	.....	2	28	9	.....	1	.....	2	9	.....	99
Radar	3	4	23	1	1	.....	.....	.....	.....	17	8	2	.....	.....	.....	.....	1	60
Fathometer—depth of water	.....	.....	.....	.....	14	.....	.....	.....	.....	19	5	1	.....	.....	.....	.....	.....	39
Engine order telegraph	1	10	.....	10	3	.....	.....	.....	1	2	2	.....	.....	.....	.....	.....	.....	28
Navigation equipment—other	72	11	2	10	11	.....	.....	.....	3	87	26	4	.....	.....	.....	.....	1	227
Navigation lights	26	13	.....	1	6	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	48
Navigation signals	157	5	15	5	14	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	197
Weather (generally)	16	28	.....	76	30	.....	.....	.....	.....	46	36	29	2	.....	3	1	6	273
Currents and tides	41	25	.....	148	22	.....	.....	.....	.....	39	36	14	1	.....	3	.....	47	376
Lifesaving equipment	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	8	.....	21	.....	2	33
Firefighting equipment	.....	.....	.....	.....	.....	2	.....	.....	3	.....	.....	.....	.....	.....	.....	1	.....	6
Miscellaneous:																		
Yard repairs	3	.....	.....	2	.....	8	.....	.....	13	4	1	5	1	.....	2	9	2	50
Improper loading or stowage	8	5	.....	4	5	27	5	1	9	4	7	67	17	6	23	2	4	194
Tug assisting	249	117	12	216	64	4	.....	.....	4	78	22	26	1	.....	.....	.....	13	806
Anchor equipment	.....	22	.....	5	7	.....	.....	.....	.....	32	14	3	6	.....	35	4	4	132
Towing equipment	12	18	.....	31	16	.....	.....	.....	.....	27	7	25	4	.....	2	.....	12	154
Mooring equipment	.....	40	.....	32	15	.....	.....	.....	.....	10	6	16	5	.....	6	1	49	180
Fishing equipment	19	2	.....	1	7	.....	.....	.....	.....	9	3	6	1	.....	2	.....	3	52
Deck equipment—all other	.....	7	.....	7	8	.....	.....	.....	3	1	.....	5	5	.....	6	.....	1	43
Engineering:																		
Main propulsion machinery	11	32	.....	31	84	.....	19	.....	41	38	8	33	1	.....	11	140	6	455
Boiler parts and accessories	.....	3	.....	1	4	1	8	22	25	5	2	2	.....	.....	2	212	.....	287
Machinery—all other	.....	.....	.....	1	10	.....	1	.....	1	3	.....	28	.....	.....	5	1	.....	50
Tools and working spaces	.....	.....	.....	.....	.....	.....	.....	.....	9	.....	.....	7	.....	.....	1	5	.....	22
Generators and other electrical equipment	.....	1	.....	2	.....	3	3	.....	26	4	2	2	.....	.....	.....	54	.....	97
Wiring, lights, controls	.....	3	.....	2	.....	.....	3	.....	38	.....	1	1	3	.....	1	6	1	59
Steward's department:																		
Galley and steward's department equipment	.....	.....	.....	.....	.....	.....	3	.....	17	.....	.....	.....	.....	.....	.....	.....	.....	20

See footnotes at end of table.

STATISTICAL SUMMARY OF CASUALTIES TO COMMERCIAL VESSELS[1] Continued

1 July 1968, to 30 June 1969 Fiscal year 1969	Nature of casualty																
	Collisions; crossings, meeting, and overtaking	Collisions, while anchored, docking, or undocking	Collision, fog	Collisions with piers and bridges	Collisions, all others	Explosion and/or fires—cargo	Explosions and/or fires—vessel's fuel	Explosion and/or fire—boilers, pressure vessel	Explosion and/or fire—structure, equipment—all others	Grounding with damage	Grounding without damage	Founderings, capsizings, and floodings	Heavy weather damage	Cargo damage	Material failure—structure and equipment	Material failure—machinery and engineering equipment	Casualty not otherwise classified	Total
TYPE OF VESSEL																		
Inspected vessels:																		
Passenger and ferry—large	3	4	-----	12	4	-----	-----	-----	3	2	3	1	1	-----	-----	5	-----	38
Passenger and ferry—small	13	7	6	4	13	-----	2	-----	9	10	4	4	1	-----	2	1	1	77
Freight	31	88	5	107	78	11	-----	12	22	47	96	11	20	4	89	178	19	827
Cargo barge	14	3	1	12	7	-----	1	-----	1	12	2	4	2	-----	-----	-----	6	65
Tankships	13	17	5	27	33	2	-----	-----	7	23	24	2	8	-----	22	45	6	234
Tank barge	106	55	5	106	35	9	-----	-----	2	47	8	11	2	-----	2	1	15	464
Public	-----	-----	-----	1	1	-----	-----	-----	1	-----	-----	-----	2	-----	-----	2	-----	7
Miscellaneous	4	7	1	8	7	2	1	-----	3	2	1	-----	1	-----	3	1	1	42
Uninspected vessels:																		
Fishing	60	35	2	9	55	-----	12	1	47	133	39	108	5	-----	13	25	6	550
Tugs	252	80	13	242	90	2	5	-----	22	100	24	81	4	-----	7	7	16	945
Cargo barge	87	46	6	84	20	5	-----	-----	4	32	10	40	1	-----	4	-----	48	387
Foreign	43	70	6	18	16	5	1	1	4	20	18	2	-----	-----	4	1	3	212
Miscellaneous	60	82	7	19	31	-----	8	-----	27	26	7	41	2	-----	11	8	6	335
GROSS TONNAGE																		
300 tons or less	344	179	25	236	175	5	28	1	102	249	78	238	10	-----	27	31	30	1,763
Over 300 to 1,000 tons	219	95	12	174	55	9	-----	-----	13	74	12	52	2	-----	11	2	54	784
Over 1,000 to 10,000 tons	158	157	11	191	113	17	2	12	24	92	96	13	29	2	76	166	35	1,194
Over 10,000 tons	85	63	9	48	47	5	-----	1	13	39	50	2	17	2	43	70	8	442
LENGTH																		
Less than 100 feet	393	154	19	207	164	3	28	1	91	233	68	210	7	-----	27	32	20	1,567
100 to less than 300 feet	368	171	22	275	101	16	1	-----	26	140	34	86	7	-----	13	13	79	1,352
300 to less than 500 feet	48	88	5	86	68	12	1	11	21	30	62	6	23	3	64	141	22	691
500 feet and over	27	81	11	81	57	5	-----	2	14	51	72	3	21	1	53	88	6	573
AGE																		
Less than 10 years	335	181	24	215	123	9	9	-----	37	124	55	82	13	-----	28	36	54	1,325
10 to less than 20 years	227	138	16	201	89	10	11	-----	39	141	51	83	11	-----	20	20	33	1,000
20 to less than 30 years	140	127	9	155	127	14	5	14	52	120	99	72	32	4	92	196	30	1,288
30 years and over	44	48	8	78	51	3	5	-----	24	69	31	68	2	-----	17	22	10	480
LOCATION OF CASUALTY	**NUMBER OF CASUALTIES**																	
Inland—Atlantic	43	47	3	81	47	11	6	1	33	82	85	28	1	-----	13	18	2	501
Inland—Gulf	91	46	7	114	61	5	6	1	30	53	34	46	2	-----	8	12	9	525
Inland—Pacific	10	33	1	37	43	2	7	4	24	73	28	37	4	1	16	32	7	359
Ocean—Atlantic	6	-----	1	-----	12	2	1	-----	13	23	1	25	14	2	17	37	2	156
Ocean—Gulf	14	3	-----	4	26	-----	2	1	20	29	5	40	5	-----	6	19	2	176
Ocean—Pacific	11	3	4	3	24	1	3	3	15	26	3	31	24	1	45	102	3	302
Great Lakes	4	14	-----	68	23	-----	-----	-----	3	21	17	4	1	-----	11	15	2	183
Western rivers	42	11	2	55	16	3	1	-----	4	29	6	38	-----	-----	6	3	19	235
Ocean—other	3	4	1	3	3	-----	-----	1	1	2	3	-----	3	-----	5	17	-----	46
Foreign waters	9	33	2	24	17	6	1	2	4	14	33	1	-----	-----	22	18	15	201
TIME OF DAY																		
Daylight	85	126	10	214	151	19	16	5	70	170	124	139	26	1	100	167	38	1,461
Nighttime	141	60	8	156	104	9	10	8	57	167	80	98	25	2	45	86	20	1,076
Twilight	7	8	3	19	17	2	1	-----	20	15	11	13	3	1	4	20	2	147
ESTIMATED LOSSES—UNITS OF THOUSANDS																		
Vessel	7,422	2,088	3,222	4,107	3,314	1,470	520	593	11,260	8,882	6	11,414	796	1	3,307	4,150	5,715	68,267
Cargo	1,072	51	6	293	91	1,488	17	4	72	310	0	1,019	540	14	121	43	5,128	10,269
Property	2,046	114	-----	4,699	239	-----	14	1	212	89	3	226	-----	-----	19	24	240	7,926
VESSELS TOTALLY LOST																		
Inspected	6	-----	-----	3	4	2	2	-----	3	2	-----	8	1	-----	-----	-----	-----	31
Uninspected	15	11	1	4	30	1	16	2	56	67	-----	128	2	-----	7	1	3	342

[1] Statistics concerning recreation and pleasure boating accidents are published in CG-357.

STATISTICAL SUMMARY OF DEATHS/INJURIES DUE TO A VESSEL CASUALTY [1]

1 July 1968, to 30 June 1969

Fiscal year 1969

	Nature of casualty																	
	Collisions; crossing, meeting, and overtaking	Collisions, while anchored, docking, or undocking	Collision, fog	Collisions with piers and bridges	Collisions, all others	Explosion and/or fires—cargo	Explosion and/or fires—vessel's fuel	Explosion and/or fire—boilers, pressure vessel	Explosion and/or fire—structure, equipment—all others	Grounding with damage	Grounding without damage	Founderings, capsizings, and floodings	Heavy weather damage	Cargo damage	Material failure—structure and equipment	Material failure—machinery and engineering equipment	Casualty not otherwise classified	Total
Number of casualties	20	8	5	2	8	9	8	4	14	3	1	36	2	------	17	4	6	147
Number of deceased/injured—inspected vessels	21/47	--/1	--/8	------	--/7	6/9	--/1	1/4	4/2	--/1	------	------	--/2	------	3/4	--/3	1/4	36/93
Number of deceased/injured—uninspected vessels	62/10	6/6	1/1	--/2	3/3	--/10	1/8	------	17/16	5/1	--/1	66/9	2/--	------	13/12	1/1	4/--	181/80
Number of persons deceased/injured	83/57	6/7	1/9	--/2	3/10	6/19	1/9	1/4	21/18	5/2	--/1	66/9	2/2	------	16/16	1/4	5/4	217/173
PRIMARY CAUSE	Number of casualties																	
Personnel fault:																		
Pilots—State	3	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	3
Pilots—Federal	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Licensed officer—documented seaman	3	2	5	------	------	1	1	2	1	------	1	4	------	------	1	------	------	21
Unlicensed—undocumented persons	5	1	------	1	1	1	3	------	4	1	------	8	------	------	2	------	------	27
All others	6	1	------	------	1	3	1	------	4	------	------	2	------	------	3	1	------	22
Calculated risk	1	1	------	------	------	------	------	------	------	------	------	2	------	------	------	------	------	4
Restricted maneuvering room	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Storms—adverse weather	------	------	------	------	1	------	------	------	------	1	------	11	2	------	1	------	2	18
Unusual currents	------	------	------	------	------	------	------	------	------	------	------	1	------	------	------	------	------	1
Sheer, suction, bank cushion	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Depth of water less than expected	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Failure of equipment	2	------	------	------	2	1	3	2	4	1	------	3	------	------	10	3	------	31
Unseaworthy—lack of maintenance	------	------	------	------	------	------	------	------	------	------	------	4	------	------	------	------	------	4
Floating debris—submerged object	------	1	------	1	3	------	------	------	------	------	------	1	------	------	------	------	------	6
Inadequate tug assistance	------	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	1
Fault on part of other vessel or person	------	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	1	2
Unknown—insufficient information	------	------	------	------	------	3	------	------	1	------	------	------	------	------	------	------	3	7
DEATH/INJURED BY VESSEL TYPE	Number of persons deceased/injured																	
Inspected vessels:																		
Passenger and ferry—large	------	--/1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	--/1
Passenger and ferry—small	--/1	------	--/3	------	--/6	------	--/1	------	------	------	------	------	--/2	------	1/--	------	------	1/13
Freight	21/46	------	--/4	------	--/1	------	------	1/4	--/1	------	------	------	------	------	1/4	--/1	1/4	24/65
Cargo barge	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	--/---
Tankships	------	------	--/1	------	------	--/4	------	------	3/--	------	------	------	------	------	------	--/1	------	3/6
Tank barges	------	------	------	------	------	6/5	------	------	------	--/1	------	------	------	------	------	--/1	------	6/7
Miscellaneous	------	------	------	------	------	------	------	------	1/1	------	------	------	------	------	1/--	------	------	2/1
Uninspected vessels:																		
Fishing	2/--	--/3	------	------	2/1	------	1/5	------	3/2	5/1	------	33/3	2/--	------	2/1	------	4/--	54/16
Tugs	3/3	--/1	------	--/1	--/1	--/5	--/1	------	2/2	------	--/1	8/2	------	------	------	------	------	13/17
Foreign	26/3	------	------	------	------	--/5	------	------	1/1	------	------	------	------	------	4/7	1/1	------	32/17
Miscellaneous	31/4	6/2	1/1	--/1	1/1	------	--/2	------	11/11	------	------	25/4	------	------	7/4	------	------	82/30
PARTICULARS OF PERSON DECEASED/INJURED																		
Papers of deceased/injured:																		
Licensed by Coast Guard	5/8	--/1	--/2	------	------	1/1	--/2	1/1	1/--	------	------	5/--	------	------	------	--/2	1/1	14/18
Documented by Coast Guard	16/25	------	--/5	------	--/1	1/3	------	--/2	------	--/1	------	8/1	--/1	------	1/4	--/1	--/2	26/46
No license or document	20/20	6/6	1/2	--/2	3/9	4/15	1/7	--/1	19/17	5/1	--/1	52/8	2/1	------	12/12	------	4/--	129/102
Other—unknown—foreign	42/4	------	------	------	------	------	------	------	1/1	------	------	1/--	------	------	3/--	1/1	--/1	48/7
Status or capacity on vessel:																		
Passenger	10/15	3/1	1/--	------	1/7	------	--/3	------	------	------	------	7/--	--/1	------	2/--	------	------	24/27
Longshoreman—harbor worker	------	1/--	------	------	------	2/10	------	--/1	2/6	------	------	------	------	------	1/7	------	------	6/23
Crewmember	70/42	2/6	--/9	--/1	2/3	3/8	1/6	1/3	7/6	5/2	--/1	58/9	2/1	------	11/9	1/4	5/4	168/114
Other and unknown	3/--	------	------	--/1	------	1/1	------	------	12/7	------	------	1/--	------	------	2/--	------	------	19/9
Activity engaged in:																		
Off duty	--/3	--/1	--/1	------	------	--/2	------	------	2/1	------	------	8/1	--/1	------	------	------	------	10/10
Deck department duties	21/17	1/2	1/5	--/1	2/1	3/3	--/2	--/1	14/9	1/2	------	16/6	2/--	------	8/5	--/1	3/2	72/57
Engine department duties	20/11	--/1	--/1	------	------	1/1	------	1/3	1/--	------	------	2/--	------	------	1/--	1/2	------	27/19
Stewards department duties	10/11	------	--/2	------	--/1	--/1	------	------	------	1/--	------	------	------	------	------	------	--/2	11/17
Handling cargo	------	------	------	------	--/1	--/2	------	------	------	------	------	------	------	------	2/7	------	------	2/10
Fishing	------	--/1	------	--/1	------	------	------	------	------	2/--	------	30/--	------	------	------	------	1/--	33/2
Drills	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Passenger	10/15	3/1	------	------	1/7	------	--/3	------	------	------	------	3/--	--/1	------	2/--	------	------	19/27
Other and unknown	22/--	2/1	------	------	------	2/10	1/4	------	4/8	1/--	--/1	7/2	------	------	3/4	--/1	1/--	43/31
Location of vessel:																		
At dock	------	--/1	------	------	------	--/13	1/5	--/3	5/5	------	------	------	------	------	5/10	1/2	1/--	13/39
At anchor	------	2/1	------	------	------	1/1	--/1	------	11/11	------	------	------	------	------	5/4	------	------	19/18
Underway	83/57	4/5	1/9	--/2	3/10	5/5	--/3	1/1	5/2	5/2	--/1	66/9	2/2	------	6/2	--/2	4/4	185/116
PART OF BODY INVOLVED																		
Head and upper limbs	--/9	--/1	--/2	--/1	--/3	--/1	------	------	--/1	------	------	--/2	--/1	------	3/3	------	--/1	3/25
Back and lower limbs	--/1	--/4	--/2	--/1	--/1	--/2	--/1	--/1	--/1	------	------	--/4	------	------	1/2	------	--/1	1/21
Multiple injuries (internal and external)	14/47	--/2	--/8	------	--/6	1/16	--/8	--/3	5/16	--/2	--/1	--/3	--/1	------	3/11	--/4	1/2	24/127
Death—heart	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	1/--	------	1/---
Death—drowning	19/--	1/--	1/--	------	2/--	4/--	------	------	7/--	5/--	------	42/--	1/--	------	5/--	------	------	87/---
Death—other	50/--	5/--	------	------	1/--	1/--	1/--	1/--	9/--	------	------	24/--	1/--	------	4/--	------	4/--	101/---

[1] Statistics concerning recreation and pleasure boating accidents are published in CG-357.

STATISTICAL SUMMARY OF DEATHS ON BOARD COMMERCIAL VESSELS[1]

(Not Involving a Vessel Casualty)

1 July 1968, to 30 June 1969

Fiscal year 1969

Total 428	CAUSE OF DEATH	Nature of death: Natural causes	Homicide	Suicide	Disappearance	Slips and falls—ladders	Slips and falls—gangways	Slips and falls—on deck	Slips and falls—other	Falls from vessel—into water	Falls into holds or tanks	Struck by objects: falling, dropped, or moving	Exposure and asphyxiation	Struck against, crushed, bumped into objects	Operating machinery and tools	Burns and scalds (other than electrical)	Electrical shock and burns	Caught in lines, chains or wire ropes	Pinching and crushing	Heavy weather	Overexertion, sprains, and strains	Cuts, lacerations, bruises, and punctures	Altercations and misconduct	Unknown or insufficient information
15	Intoxication					1				12			2											
194	Physical deficiency or handicap	88					1			2		1											1	1
23	Unsafe movement or posture								2	18	1	1							1					
52	Psychological—immaturity, insanity		1	20						31														
16	Unsafe practice								1	7	3	3	1	1										
5	Violation of law or regulation		4						1															
76	Human errors					3	1		2	52	5	7	1		1			1	3					
6	Decks—slippery or cluttered									6														
9	Weather conditions									7		1								1				
0	Poor maintenance or housekeeping																							
2	Inadequate lighting									2														
9	Inadequate rails or guards									5	1	2						1						
4	Failure of equipment											4												
1	Inadequate supervision								1															
5	Inadequate life preservers									5														
0	Inadequate tools or equipment																							
2	Inadequate protective equipment								2															
4	Improper use of tools or equipment								1	2		1												
5	Miscellaneous causes												5											
	TYPES OF VESSELS INVOLVED																							
	Inspected vessels:																							
43	Passenger and ferry—large	33		1						7		2												
20	Passenger and ferry—small	14	1	1				1		3		1												
134	Freight ships and barges	77		13		3	1		3	20	6	6	1						1	1			1	1
42	Tankships and barges	22	3			1			1	13			2											
4	Public	3								1														
10	Miscellaneous	3		1					1	3		1						1						
	Uninspected vessels:																							
64	Fishing	17	1	1			1			34		3	5					1	1					
45	Tugs	12								30		1	1	1										
23	Foreign	3		3					1	12	3	1												
43	Miscellaneous	4							4	26	1	5			1				2					
	TIME OF DAY																							
230	Daytime	110	1	8		3	1		8	64	7	13	8	1	1			1	2	1			1	
170	Nighttime	69	2	10		1	1		2	73	3	5	1					1	1					1
28	Twilight	9	2	2						12		2							1					
	PARTICULARS OF DECEASED																							
	Papers of deceased:																							
58	Licensed by Coast Guard	41		4		1				8	2	1		1										
142	Documented by Coast Guard	78	3	10		2	1		4	36		2	3					1		1			1	
213	No license or document	67	2	4		1	1		6	98	6	15	6		1			1	4					1
15	Other—unknown—foreign	2		2						7	2	2												
	Status capacity on vessel:																							
52	Passenger	39	1	1						10									1					1
23	Longshoreman—Harbor Worker	2							1	7	3	5	4						1					
305	Crewmember	138	4	19		3	1		4	115	3	7	4	1				2	2	1			1	
48	Other	9				1	1		5	17	4	8	1		1				1					
	Activity engaged in:																							
157	Off duty	86	1	14		1	1			49	1		2					1					1	
91	Deck department duties	21	2	1					4	51	1	6	1	1				1	2					
31	Engine department duties	17		3		1				5	2	2	1											
15	Stewards department duties	8				1				5										1				
16	Handling cargo								1	1	3	5	5						1					
39	Fishing	19	1	1			1			14		3												
1	Drills	1																						
42	Passenger	32		1						8														1
36	Other and unknown	4	1			1			5	16	3	4			1				1					
	Location of vessel:																							
165	At dock	59	2	4		2	2		7	55	8	13	7		1			2	3					
15	At anchor	2							2	9			1	1										
248	Underway	127	3	16		2			1	85	2	7	1						1	1			1	1
	PART OF BODY INVOLVED																							
33	Head and upper limbs	1	3	5		2			2		6	10		1	1				2					
1	Back and lower limbs																	1						
26	Multiple injuries (internal-external)	1	1	1		1			6	2	2	9						1	2					
173	Death—heart	170					1			1													1	
163	Death—drowning			13		1			1	146	1	1												
32	Death—other	16	1	1			1		1		1		9							1				1

*Statistics concerning recreation and pleasure boating accidents are published in CG-357.

STATISTICAL SUMMARY OF PERSONNEL INJURIES ON BOARD COMMERCIAL VESSELS [1]

(Not Involving a Vessel Casualty)

Total	1 July 1968, to 30 June 1969 Fiscal year 1969	Nature of injury																
		Slips and falls—ladders	Slips and falls—gangways	Slips and falls—on deck	Slips and falls—other	Falls from vessel—into water	Falls into holds or tanks	Struck by objects; falling, dropped, or moving	Exposure and asphyxiation	Struck against, crushed, bumped into objects	Operating machinery and tools	Burns and scalds (other than electrical)	Electrical shock and burns	Caught in lines, chains, or wire ropes	Pinching and crushing	Heavy weather	Overexertion, sprains, and strains	Cuts, lacerations, bruises, and punctures	Altercations and misconduct	Unknown or insufficient information
2167	CAUSE OF INJURY																			
69	Intoxication	11	8	11	9	1				4		2			4		2	6	8	3
53	Physical deficiency or handicap	5	1	7	8			2	1	3	1						16	1		8
272	Unsafe movement or posture	20	4	15	41	1	2	6		31	1	3		2	9		122	12		3
114	Psychological—immaturity, insanity	1		1	7					3							1	7	92	2
186	Unsafe practice	19	1	5	23		4	44	1	8	6	16	1	6	12	1	25	9		5
4	Violation of law or regulation								2	1									1	
936	Human errors	145	34	131	78	3	3	137	1	78	18	48	4	29	81	3	59	58	1	25
105	Decks—slippery or cluttered	11	1	62	10		1	1		4		1					10	3		1
110	Weather conditions	10	1	12	16	1		15		14		2			12	3	6	17		1
17	Poor maintenance or housekeeping	1		1	2			3		1		3	1		2			2		1
24	Inadequate lighting	5		3	7		2			3							1	3		
16	Inadequate rails or guards	2			3			1			5	2			1	1				1
74	Failure of equipment	3	2		9		2	33		2	2	6	2		4		1	8		
19	Inadequate supervision				2			7		2		4			3		1			
0	Inadequate life preservers																			
7	Inadequate tools or equipment		1					2			1	1	1		1					
56	Inadequate protective equipment	7		3	2			21		2		7		2			2	6		4
82	Improper use of tools or equipment	1		2	8			20		8	11	1		1	5		7	10		8
23	Miscellaneous causes			1				4		1		3	1				1	5	3	4
	TYPES OF VESSELS INVOLVED																			
	Inspected vessels:																			
204	Passenger and ferry—large	30	6	33	16			25		15	2	10	1	1	7		30	9	9	10
10	Passenger and ferry—small		1	5		1												2		1
1,646	Freight ships and barges	172	45	179	184	2	9	208	5	139	32	79	8	19	109	8	197	117	85	49
148	Tankships and barges	27	1	26	15		2	23		3	3	6		1	5		13	10	10	3
17	Public	4		4	1			4				6					1	1		1
26	Miscellaneous	1		1	3			5		1	2			2	7		3	1		
	Uninspected vessels:																			
54	Fishing	3		2	1			14		2	5	1		12	4		7	3		
35	Tugs	3		2	4	2		13		2	1	1	1	3			2			1
4	Foreign	1									1		1	1						
23	Miscellaneous			2	1	1	3	4		3				1	1		1	4	1	1
	TIME OF DAY																			
1,470	Daytime	151	24	166	149	4	4	235	4	101	37	60	10	28	95	6	192	98	46	51
589	Nighttime	78	27	75	67	1	9	48	1	51	7	26		10	30	2	55	39	53	10
108	Twilight	12	2	13	9	1	1	13		13	1	4		2	9		7	10	6	5
	PARTICULARS OF PERSON INJURED																			
	Papers of person injured:																			
192	Licensed by Coast Guard	24	5	18	18		1	22	2	13	3	28		2	8	1	21	11	10	5
1,809	Documented by Coast Guard	207	47	219	194	3	9	241	3	143	33	67	10	18	112	7	224	123	91	58
161	No license or document	10	1	17	13	3	4	33		9	9	3		19	12		8	13	4	3
5	Other—unknown—foreign											1		1	2		1			
	Status or capacity on vessel:																			
18	Passenger		1	6	2	1		1		2	1							3		1
12	Longshoreman—harbor worker	1		1	2			4		1		2			1					
2,107	Crewmember	238	52	245	218	5	14	281	5	160	42	97	10	38	128	8	253	143	105	65
30	Other	2		2	3			10		2	2			2	5		1	1		
	Activity engaged in:																			
385	Off duty	53	42	54	45	2	1	11		40		5	1		19	1	14	21	69	7
882	Deck department duties	82	5	105	118	3	11	183	3	54	20	9	3	32	45	5	117	70	15	3
493	Engine department duties	68	4	33	36		2	55		42	17	66	6	3	27	1	79	31	11	10
307	Stewards department duties	35	1	53	19			25		23	1	16			28	1	35	15	10	45
3	Handling cargo			1	1										1					
42	Fishing	3		4	2	1		11		1	3	1		4	5		5	2		
18	Drills							5		1		1			4		4	3		
14	Passenger		1	4	1			1		2	1							3		1
23	Other and unknown				3			6		2	3	1		1	5			2		
	Location of vessel:																			
942	At dock	93	49	88	88	3	6	140	1	60	16	50	5	19	63		103	56	71	31
35	At anchor	4	1	7	6	1		4				2		1	5		4			
1,190	Underway	144	3	159	131	2	8	152	4	105	29	47	5	20	66	8	147	91	34	35

See footnote at end of table.

STATISTICAL SUMMARY OF PERSONNEL INJURIES ON BOARD COMMERCIAL VESSELS [1]
Continued

(Not Involving a Vessel Casualty)

Total	1 July 1968, to 30 June 1969 Fiscal year 1969	Nature of injury																		
		Slips and falls—ladders	Slips and falls—gangways	Slips and falls—on deck	Slips and falls—other	Falls from vessel—into water	Falls into holds or tanks	Struck by objects; falling, dropped, or moving	Exposure and asphyxiation	Struck against, crushed, bumped into objects	Operating machinery and tools	Burns and scalds (other than electrical)	Electrical shock and burns	Caught in lines, chains, or wire ropes	Pinching and crushing	Heavy weather	Overexertion, sprains, and strains	Cuts, lacerations, bruises, and punctures	Altercations and misconduct	Unknown or insufficient information
	Part of body injured:																			
119	Head and neck	19	1	13	13			26		18		3	1				1	4	17	3
79	Eye and face	3		1	3			36		2	3	9	1	1				6	12	2
162	Arm and shoulder	19	3	26	21		1	21		13	2	11	2	2	3	1	12	11	13	1
435	Hand	24	2	29	18			43		28	27	17	2	23	101	1	16	61	5	38
286	Leg and hip	29	10	39	34	2	5	40	1	48	4	8	1	6	9	2	23	16	4	5
321	Feet	24	24	35	30		1	78	1	17	3	15		2	15		50	22	2	3
307	Back	53	4	63	37			10	1	13	2	1		1			112	6	3	1
91	Body—external	12	1	6	9	1		11	2	9		10	1				18	4	7	
67	Body—internal	12	4	9	14		1	3		8	1						1	6	5	2
18	Hernia	1						1		1							15			
251	Multiple body injuries	42	4	32	42	1	6	26		6	3	24	2	5	6	4	4	10	33	1
31	All other injuries	3		1	4	2		1	1	2		1					2	1	4	9
	ADDITIONAL CONTRIBUTING FACTORS TO CAUSE OF INJURY																			
549	Human element	46	17	55	49	1	5	62		40	10	15	3	3	34	2	80	35	84	8
154	Decks—slippery or cluttered	21		70	26	2		7		9		1		1	1		12	3		1
85	Weather conditions	10	3	16	11	2	1	8		5	1	2			11		6	7		2
59	Poor maintenance or housekeeping	7		17	12		1	2		6		2			2		4	4		2
29	Inadequate lighting	4		10	4		3	1		3				1	2		1			
26	Inadequate rails or guards	4	1		10		1	2				2		3	2			1		
24	Failure of equipment				4			7	2	1	1	3			2			3		1
140	Inadequate supervision	5	1	2	23		2	48	1	4	3	16		3	10	1	11	10		
21	Inadequate tools or equipment	1			7			2		1	1			1	3		4			1
97	Inadequate protective equipment	9		14	5			33	1	3	2	13	1	4	1		2	8		1
147	Improper use of tools or equipment	4	1	6	18		1	35		9	12	12	3	8	13		6	11		8
123	Hull structure	5	2	48	22			8		11					3	1	17	6		
73	Holds, hatches, tanks	9		4	16		9	5	1		3	1		1	5		16	3		
187	Ladders, gangways, stairs	103	26		4	1		10		9				2	7		16	7		2
109	Mast, booms, cargo gear	3		8	14		1	26		7	3			6	13		16	12		
88	Watertight closures			8	12			8	1	9					34			14		2
132	Living spaces	11	1	27	31			8		19		1			11		10	9	3	1
27	Fishing equipment			1	1			9			1			7	4		3	1		
36	Navigational equipment	2		9	7			3		7			1		1		2	4		
25	Lifesaving equipment		1		7			5				1	1		5		3	2		
9	Firefighting equipment							5		2					1			1		
0	Communications equipment																			
4	Yard repairs			1	1							2								
99	Improper loading, stowage, and ventilation	1		18	16			14	2	13		1			4	2	15	13		
16	Ground tackle			2				8		3	1			2						
18	Tugs and towing equipment			2	3	2		7		1					2			1		
116	Mooring equipment			7	6			65		2	2			12	2		14	6		
66	Miscellaneous deck department equipment	3		3	6			15		3	5	5	1	6	4		9	5		1
4	Main propulsion machinery				1						1						2			
88	Boiler parts and accessories			1	2			10		8		55			2		7	2	1	
188	Auxiliary machinery	22	1	18	18		1	21	1	27	9	13		1	15		20	18		3
27	Electrical equipment				1			6		1	3		7		3		2	4		
178	Galley equipment	13		21	10			13		16	1	17	2	1	15	1	20	7	2	39
29	Causes not otherwise classified	3		1	2		2	1		3	1				8	1	3	2	2	

[1] Statistics concerning recreation and pleasure boating accidents are published in CG–357.

IMCO ACTIVITIES

A significant event in the history of international cooperative efforts to cope with pollution of the marine environment occurred over a decade ago when various governments met in London, England, to discuss ways and means of restricting the overboard discharge of oil from tankers and oil-burning ships. Mutual agreement reached at that conference was formalized in the wording of the 1954 International Convention for Preventing Pollution of the Seas by Oil, which came into force in 1957.

The first permanent international maritime body, to be known as the Intergovernmental Maritime Consultative Organization (IMCO) came into being during the early part of the year 1959. At that time IMCO took over duties under the 1954 Oil Pollution Convention formerly handled by the United Kingdom Government. IMCO at that time also took over from the United Nations the responsibility for collecting and disseminating technical information about oil pollution.

It was in the year 1962 that IMCO convened a conference for the purpose of reviewing the Oil Pollution Convention. That conference adopted a number of amendments to the Convention. The purpose of those amendments was to increase the scope of the Convention and to lay down more stringent provisions. And, in 1965, IMCO formed the Subcommittee on Oil Pollution (later renamed the Subcommittee on Marine Pollution) in order that problems relating to pollution of the seas might be kept under constant review.

It was on 18 March 1967 that the *Torrey Canyon*, while traveling at a speed of about 17 knots and carrying 117,000 tons of Kuwait crude oil, ground to a halt on the Seven Stones Reef between the Isles of Scilly and Lands End. Pollution of the beaches of England and France by oil released from the *Torrey Canyon* was of such magnitude as to cause a dramatic concentration of international effort toward developing ways and means of avoiding another such disaster. In consequence, IMCO, as the recognized international forum for dealing with such maritime matters, has embarked upon an extensive program of studies directed toward solving the difficult problems inherent in implementing stricter international rules for preventing pollution of the marine environment. Such activities extend far beyond the relatively simple problem of how to cope with discharge of oil from ships at sea. IMCO, and specifically the Subcommittee on Marine Pollution, is now charged with the all-embracing task of developing proposals for the prevention and correction of pollution of the sea, land, and the air, by oil and by agents other than oil, from ships, vessels, and other equipment operating in the marine environment. In this connection the term "marine environment" may apply, in addition to the open sea, to ports, harbors, and inland waters accessible to seagoing ships.

The IMCO Subcommittee on Marine Pollution has met twice during this calendar year. Significant changes aimed at strengthening the Oil Pollution Convention were adopted and agreed upon during the April 1969 session. The following items were worked on during the September 1969 session:

a. Preparation of draft specifications for oil-content meters and oil/water separators.

b. Responses to a questionnaire circulated to governments concerning action taken to implement national arrangements for dealing with significant spillages of oil.

c. Pollution by agents other than oil and the need for a separate Convention on this subject.

d. Research on methods of removing oil from the sea.

e. Responses to a questionnaire circulated to governments concerning the extent of deliberate pollution such as dumping of waste materials and sewage, the extent of accidental pollution such as caused by casualties to ships carrying noxious or hazardous cargoes, and the extent of pollution arising from exploration and exploitation of the seabed.

f. Pumping of ships' bilges while in port.

g. Automatic bilge pumping systems.

h. Work of the joint IMCO/FAO/UNESCO/WMO Group of Experts on the Scientific Aspects of Marine Pollution, now considering such matters as:

(1) Research priorities concerning major categories of pollutants, particularly with a view to facilitating international action for pollution control.

(2) Chemical means for absorbing, precipitating, and removing oil from the sea.

(3) Dispersion and transport of surface pollution by natural physical processes.

(4) Exploration and exploitation of the seabed and ocean floor.

(5) Effects of various pollutants, including oil, on marine life, with determination of permissible concentrations of such pollutants.

The seventh session of the Subcommittee on Marine Pollution was held at IMCO Headquarters, London, England, from 8–12 September 1969. The U.S. delegation was led by Rear Adm. R. Y. Edwards, Chief, Office of Public and International Affairs, Coast Guard Headquarters, assisted by Rear Adm. H. C. Shepheard, USCG (retired), American Institute of Merchant Shipping, Washington, D.C.; Capt. F. D. Heyward, Chief, Law Enforcement Division, Coast Guard Headquarters; Comdr. M. E. Welsh, Assistant Chief, Hazardous Materials Division, Coast Guard Headquarters; and Mr. J. H. Seelinger, Senior Project Engineer, U.S. Maritime Administration, Washington, D.C. ⚓

AMENDMENTS TO REGULATIONS

Title 33 Changes

Chapter I—Coast Guard, Department of Transportation

MISCELLANEOUS AMENDMENTS TO CHAPTER

1. A notice of proposed rule making was published in the FEDERAL REGISTER of February 7, 1969 (34 F.R. 1831), and in the Merchant Marine Council Public Hearing Agenda dated March 20, 1969 (CG–249). The proposed amendments were identified as Items PH 1–69 to PH 9–69, inclusive. Item PH 10–69 was published in the FEDERAL REGISTER of February 15, 1969 (34 F.R. 2254). The Merchant Marine Council held a public hearing on March 24, 1969, in Washington, D.C., on these 10 items in accordance with the terms of the notices. Interested persons were given the opportunity to submit written comments and to make oral comments regarding all the proposed amendments at the public hearing. At the conclusion of the public hearing the Council at an executive session held on March 24 and 25, 1969, duly considered all the proposed amendments and the comments submitted.

2. This is the first of a series of documents which concern the proposals considered by the Merchant Marine Council at the public hearing held on March 24, 1969. Specifically, this document concerns the proposals designated as Items PH 5–69, PH 9a–69 and that part of Item PH 4a–69 which concerns Title 33, Code of Federal Regulations. The second document concerns the proposals designated as Items PH 2–69, PH 3–69, PH 4b– and 4c–69, PH 6a–69, PH 8–69, PH 9b–69, PH 10–69 and that part of PH 4a–69 which involve amendments to Title 46, Code of Federal Regulations. These two documents are being published in the FEDERAL REGISTER at about the same time. As explained in the second document, Item 6b–69 is being withdrawn. The only items not appearing in either of these two documents, Items PH 1–69 and PH 7–69, will appear in subsequent documents.

3. Item PH 4a–69, in general, proposed changes in the requirements for waterlights in various subchapters in titles 33 and 46. This document is concerned with the proposed amendments to Subchapter N (Artificial Islands and Fixed Structures on the Outer Continental Shelf) of Chapter I, Title 33. No comments were received on this aspect of the proposal and the Council recommended the adoption without change.

4. Item PH 5–69 proposed changes to Subchapter L (Security of Vessels and Waterfront Facilities) of title 33, concerning handling of explosives or other dangerous cargoes within or contiguous to waterfront facilities. No comments were received but minor editorial changes were made to the text, and the Council recommended that the proposal be adopted.

5. Item PH 9a–69 proposed changes to Subchapter D (Navigation Requirements for Certain Inland Waters) of title 33, to permit barges operating upon international and inland waters to display lights and shapes required by International Rule 5 (33 U.S.C. 1065). One comment, which supported the proposal, was received. Minor editorial changes were made to the text, and the Council recommended that the proposal be adopted.

6. Accordingly, after due consideration of all the relevant matter including the comments of the interested persons and the recommendations of the Merchant Marine Council, the Commandant U.S. Coast Guard has approved the amendments set forth below.

The complete text of these amendments is published in the Federal Register of October 29, 1969, Part II.

Title 46 Changes

Chapter I—Coast Guard, Department of Transportation

MISCELLANEOUS AMENDMENTS TO CHAPTER

1. A notice of proposed rule making was published in the FEDERAL REGISTER of February 7, 1969 (34 F.R. 1831) and in the Merchant Marine Council Public Hearing Agenda dated March 20, 1969 (CG–249). The proposed amendments were identified as Items PH 1–69 to PH 9–69, inclusive. Item PH 10–69 was published in the FEDERAL REGISTER of February 15, 1969 (34 F.R. 2254). The Merchant Marine Council held a public hearing on March 24, 1969, in Washington, D.C., on these 10 items in accordance with the terms of the notices. Interested persons were given the opportunity to submit written comments and to make oral comments regarding all the proposed amendments at the public hearing. At the conclusion of the public hearing the Council at an executive session held on March 24 and 25, 1969, duly considered all the proposed amendments and the comments submitted.

2. This is the second of a series of documents which concern the amendments considered by the Merchant Marine Council at the puhlic hearing held on March 24, 1969. The first

document concerns the proposals designated as Items PH 5–69, PH 9a–69, and that part of Item 4a–69 which involve amendments to Title 33, Code of Federal Regulations. These two documents are being published in the Federal Register at about the same time. Item 6b–69 is withdrawn. This item proposed to amend Table 45.15–97a of 46 CFR 45.15–97 to include vessels 750 to 1,000 feet in length engaged on Great Lakes voyages. It was proposed to apply to these vessels basic minimum summer freeboard requirements determined on the basis of Type B Table of the 1966 International Load Line Convention provided they satisfy four construction requirements listed in the proposed § 45.10–105. Subsequent to the instant public hearing a superseding notice of rule making was published in the Federal Register of June 24, 1969 (34 F.R. 9754). This second notice proposed to add to Part 45 of Subchapter E a new § 45.15–100 which specified the basic minimum summer freeboards for vessels from 440 to 1,000 feet in length engaged in Great Lakes voyages provided they satisfy five construction requirements listed in the proposed section. The minimum summer freeboards were also determined on the basis of the Type B Table of the 1966 International Load Line Convention. Since no adverse comments were received, the new § 45.15–100 was promulgated in the Federal Register of July 26, 1969 (34 F.R. 12342). This amendment renders the changes originally proposed in Item PH 6b–69 unnecessary. The present document concerns the proposals designated as Items H 2–69, PH 3–69, PH 4b– and 4c–69, PH 6a–69, PH 8–69, PH 9b–69, PH 10–69, and that part of Item PH 4a–69 which concerns Title 46, Code of Federal Regulations. The only remaining items, Items PH 1–69 and PH 7–69, will appear in subsequent documents. The Merchant Marine Council has recommended changes in a number of the proposals as a result of its study of the proposals and the comments received from interested persons. The most significant changes recommended by the Council will be indicated in connection with each item.

3. Item PH 2–69 proposed miscellaneous amendments to Part 146 of Subchapter N ((Dangerous Cargoes) to clarify the application of certain regulations and to reflect current terminology. The significant changes in the proposed amendments recommended by the Merchant Marine Council are as follows: (a) Withholding of the proposed change to § 146.23–100 which would have prohibited the use of glass carboys for corrosive liquids, (b) the insertion in § 146.27–32(a) of a reference to §§ 70.10–44 and 90.10–38 for the definition of a space, "specially suitable for vehicles", (c) changing the word "containers" to "tanks" in §§ 30.01–20, 70.05–25, 90.05–30, 146.-02–30, and 188.05–30, (d) the insertion in § 146.06–14(a) of a requirement that the person preparing or supervising the preparation of the dangerous cargo manifest, rather than the master, shall certify to its truth and accuracy to the best of his knowledge and belief, (e) the insertion in § 146.29–27(a) of a limitation that a stream of water from at least one hose should reach all areas of the weather deck.

4. (a) Items PH 3a–69 to 3d–69 proposed various amendments to Subchapter D (Tank Vessels). Item 3a related to deck foam systems; Item 3b to segregation of cargo; Item 3c to fire and lifeboat drills, and Item 3d to the installation of sacrificial anodes. The Merchant Marine Council recommended no changes in Items 3a, 3b, and 3c. As to Item 3d, the Council recommended a change in the wording of § 35.01–25(b)(4) relating to composition of aluminum alloy anodes. Item PH 3e–69 proposed an amendment to § 111.70–10 (c)(2)(ii) relating to the installation of explosion-proof lights in tank vessels. The Council recommended approval of this proposal subject to the deletion of the provision that specific approval by the Commandant is required for the installation of approved explosion-proof lights.

(b) Item PH 4a–69 proposed changes in the requirements for floating electric waterlights. The Council recommended that the drop test required by § 161.010–5(b)(2) be changed from a height of 180 feet to 90 feet to make it consistent with the test required for the floating orange smoke signal by § 160.057–4 (b)(1)(i). The Council also recommended that in §§ 33.15–20(j), 75, 20–25(o), 94.20–25(o), 94.20–35 (e), 192.20–25(o), and 192.20–35(e) the requirement that the water light be attached to the lifefloat or buoyant apparatus by a 12-thread manila lanyard be amended to permit an equivalent synthetic lanyard. Item PH 4b–69 proposed a revision in the specifications for structural insulation and bulkhead panels. The Merchant Marine Council recommended that § 164.007–7(a)(2), requiring a retest schedule for domestic products of 2 years and for foreign products every year be changed to 5 years and 2 years, respectively. Item PH 4c–69 proposed amendments to the specifications for orange smoke distress signals. The Council recommended that these proposals be adopted without any change.

5. Item PH 6a–69 contained proposals to apply the 1966 International Load Line Convention rail and bulwark height of one meter (39½ inches) to tank, passenger, cargo, small passenger, and oceanographic vessels. The Merchant Marine Council recommended a change in the proposal with respect to small passenger vessels (Subchapter T). The effect of this recommendation is to apply the 1966 International Load Line Convention rail and bulwark height of one meter (39½ inches) only to those small passenger vessels which are subject to the 1966 International Load Line Convention. However, the cognizant Officer in Charge, Marine Inspection is author-

ized to approve a lesser height where the height of 39½ inches will interfere with the normal operation of the ship and he is satisfied that the lesser height will provide adequate protection. All other small passenger vessels covered by Subchapter T will continue to be covered by the existing requirements. See 46 CFR 177.35–1.

6. (a) Item PH 8a–69 proposed to amend Subchapters D, I, and U to require the applicable vessels to carry at least two emergency fireman's outfits instead of the one now required. The item also revised the components included within the fireman's emergency outfit. As a result of a comment received the Merchant Marine Council recommended a change to 46 CFR 35.30–20 which has the effect of permitting manned tank barges to continue to carry only one outfit. (h) Item PH 8b–69 proposed amendments to §§ 35.70–20(d), 78.80–15 (c), 97.70–15(c), and 146.09–15(e) which would require that the carbon monoxide concentration in the holds and intermediate decks where persons are working be maintained at not more than 50 parts per million as a time-weighted average and that persons be removed from these spaces if the concentration exceeds 75 parts per million. Item PH 2–69 proposed the same change to §§ 146.27–30(c)(1), 146.27–31(c)(1), and 146.27–32(c)(1). These proposals were predicated on the recommendations of the American Conference of Governmental Industrial Hygienists (ACGIH). A number of written and oral comments were received on this proposal. Some comments were to the effect that the present standard be left unchanged. Other comments urged that the proposed amendments should be consistent with an anticipated amendment to 29 CFR Part 1504, Safety and Health Regulations for Longshoring, by the Department of Labor. This amendment by the Department of Labor was represented as being similar to the Coast Guard proposal except that it would require the removal of persons from an affected space whenever the carbon monoxide concentration exceeds 100 parts per million. Still another comment strongly urged the Coast Guard to adopt the requirement for the removal of all persons from spaces whenever the carbon monoxide concentration exceeds 50 parts per million. The proposals and all the comments were duly considered by the Merchant Marine Council and consultations were held with representatives of the Bureau of Labor Standards of the Department of Labor. These consultations indicated no opposition to the Coast Guard proposals. Accordingly, the Merchant Marine Council recommended that the proposals in Item PH 8b–69 and the related proposals in Item PH 2–69 be adopted without change. Also, the Council, recommended a comparable change be made to §§ 78.83–1(b), 97.80–1 (b), (c), and 146.07–5(d). In addition, the Council considered the advisability of developing procedures for sampling the atmosphere for carbon monoxide in the affected spaces. However, it soon became apparent that the development of monitoring procedures would require extensive consultations with industrial hygienists and other experts. In view of the delay involved in this undertaking, the Council recommended that the amendments as proposed, without the monitoring procedures, be promulgated without further delay. However, the Coast Guard intends to develop and promulgate reasonable monitoring procedures sometime in the future.

7. (a) Item PH 9b–69 proposed to amend §§ 25.05–15 and 184.15–5 to make it clear that the definition of light intensity in terms of candlepower, as published in the FEDERAL REGISTER of December 27, 1967 (32 F.R. 20812), will apply only to new navigation lights installed on or after January 1, 1971. In response to comments received the Council recommended a minor change to the proposed amendments to ensure that the existing navigation lights on uninspected vessels and small passenger vessels under 100 gross tons will continue to be evaluated on the same basis as they were prior to the adoption of the intensity definition. (b) Item PH 10–69 proposed to amend Parts 42 and 45 to revise, in the light of current conditions, certain prescribed fees for the assignment of vessel load lines. No comments were received on this item and the Council recommended that the proposed amendments be adopted without change.

8. Accordingly, after due consideration of all the relevant matter including the comments of the interested persons and the recommendations of the Merchant Marine Council, the Commandant U.S. Coast Guard has approved the amendments set forth below.

The complete text of these amendments is published in the Federal Register of October 29, 1969 Part II.

Approved Equipment

Commandant Issues Equipment Approvals Terminates Others

U.S. Coast Guard approval was granted to certain items of lifesaving, and other miscellaneous equipment and materials. At the same time the Coast Guard terminated certain items of lifesaving, and other miscellaneous equipment and materials.

Those interested in these approvals should consult the "Federal Registers" of October 10, 11, 22, and 31, 1969, for detailed itemization and identification.

AFFIDAVITS

The following affidavit was accepted during the period from September 15 to October 15, 1969: *Dyna-Quip Division, Stile-Craft Manufacturers, Inc.*, 1801 Lilly, St. Louis, Mo. 63110 VALVES [1]

[1] Resilient-scated category "B" ball valves only.

MERCHANT MARINE SAFETY PUBLICATIONS

The following publications of marine safety rules and regulations may be obtained from the nearest marine inspection office of the U.S. Coast Guard. Because changes to the rules and regulations are made from time to time, these publications, between revisions, must be kept current by the individual consulting the latest applicable Federal Register. (Official changes to all Federal rules and regulations are published in the Federal Register, printed daily except Sunday, Monday, and days following holidays.) The date of each Coast Guard publication in the table below is indicated in parentheses following its title. The dates of the Federal Registers affecting each publication are noted after the date of each edition.

The Federal Register will be furnished by mail to subscribers, free of postage, for $2.50 per month or $25 per year, payable in advance. The charge for individual copies is 20 cents for each issue, or 20 cents for each group of pages as actually bound. Remit check or money order, made payable to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Regulations for Dangerous Cargoes, 46 CFR 146 and 147 (Subchapter N), dated January 1, 1969 are now available from the Superintendent of Documents, price: $3.75.

CG No.	TITLE OF PUBLICATION
101	Specimen Examination for Merchant Marine Deck Officers (7–1–63).
108	Rules and Regulations for Military Explosives and Hazardous Munitions (5–1–68).
115	Marine Engineering Regulations and Material Specifications (3–1–66). F.R. 12–18–68.
123	Rules and Regulations for Tank Vessels (5–1–69). F.R. 10–29–69.
129	Proceedings of the Merchant Marine Council (Monthly).
169	Rules of the Road—International—Inland (9–1–65). F.R. 12–8–65, 12–22–65, 2–5–66, 3–15–66, 7–30–66, 8–2–66, 9–7–66, 10–22–66, 12–23–67, 6–4–68, 10–29–69.
172	Rules of the Road—Great Lakes (9–1–66). F.R. 7–4–69.
174	A Manual for the Safe Handling of Inflammable and Combustible Liquids (3–2–64).
175	Manual for Lifeboatmen, Able Seamen, and Qualified Members of Engine Department (3–1–65).
176	Load Line Regulations (1–3–66). F.R. 12–6–66, 1–6–67, 9–27–67, 7–12–68, 6–5–69, 7–26–69, 10–29–69.
182	Specimen Examinations for Merchant Marine Engineer Licenses (7–1–63).
184	Rules of the Road—Western Rivers (9–1–66). F.R. 9–7–66, 5–11–67, 12–23–67, 6–4–68
190	Equipment Lists (8–1–68). F.R. 11–7–68, 11–8–68, 11–16–68, 11–19–68, 11–20–68, 12–11–68, 12–18–68, 2–11–69, 2–18–69, 2–21–69, 2–26–69, 3–15–69, 3–27–69, 4–4–69, 4–12–69 4–19–69, 4–25–69, 4–26–69, 4–28–69, 5–3–69, 5–9–69, 6–18–69, 6–19–69, 7–1–69, 7–15–69, 7–17–69, 9–12–69, 9–25–69, 10–10–69, 10–11–69, 10–22–69, 10–31–69.
191	Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel (5–1–68). F.R. 11–28–68.
200	Marine Investigation Regulations and Suspension and Revocation Proceedings (5–1–67). F.R. 3–30–68.
220	Specimen Examination Questions for Licenses as Master, Mate, and Pilot of Central Western Rivers Vessels (4–1–57).
227	Laws Governing Marine Inspection (3–1–65).
239	Security of Vessels and Waterfront Facilities (5–1–68). F.R. 10–29–69.
249	Merchant Marine Council Public Hearing Agenda (Annually).
256	Rules and Regulations for Passenger Vessels (5–1–69). F.R. 10–29–69.
257	Rules and Regulations for Cargo and Miscellaneous Vessels (1–3–66). F.R. 4–16–66, 12–6–66, 1–13–67, 12–9–67, 1–26–68, 1–27–68, 2–10–68, 4–12–68, 6–1–68, 10–2–68, 12–18–68, 12–28–68, 7–4–69, 10–29–69.
258	Rules and Regulations for Uninspected Vessels (3–1–67). F.R. 12–27–67, 1–27–68, 4–12–68, 12–28–68, 3–27–69, 10–29–69.
259	Electrical Engineering Regulations (3–1–67). F.R. 12–20–67, 12–27–67, 1–27–68, 4–12–68, 12–18–68, 12–28–68, 10–29–69.
266	Rules and Regulations for Bulk Grain Cargoes (5–1–68).
268	Rules and Regulations for Manning of Vessels (5–1–67). F.R. 4–12–68.
293	Miscellaneous Electrical Equipment List (9–3–68).
320	Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf (11–1–68). F.R. 12–17–68, 10–29–69.
323	Rules and Regulations for Small Passenger Vessels (Under 100 Gross Tons) (July 1, 1969) F.R. 10–29–69.
329	Fire Fighting Manual for Tank Vessels (7–1–68).

CHANGES PUBLISHED DURING OCTOBER 1969

The following have been modified by Federal Registers:

CG–190, Federal Registers, October 10, 11, 22, and 31, 1969.

CG–123, CG–169, CG–176, CG–239, CG–256, CG–257, CG–258, CG–259, CG–320, CG–323. Dangerous Cargoes, Specification, Nautical Schools and Oceanographic Vessels. Federal Register, October 29, 1969, Part II.

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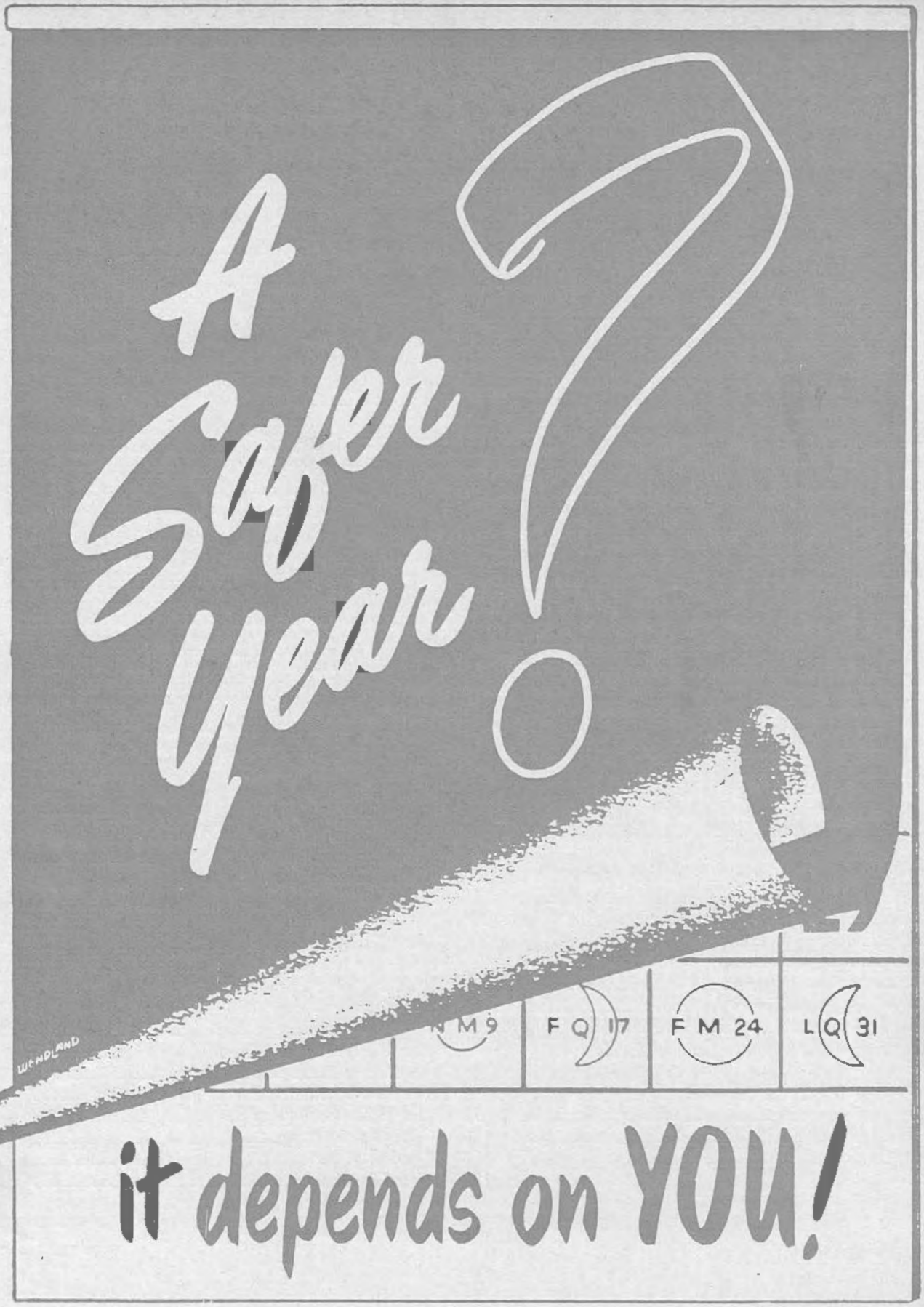
A Safer Year?
WENDLAND
N M 9
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it depends on YOU!