

Vol. 25, No. 11

# Review of Marine Casualties . . Marine Casualty Statistics . . .

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#### COVERS

- FRONT COVER: The newly christened Alaskan Mail slips down the ways in a ceremony last spring. The 605-foot general cargo vessel is one of five being built for American Mail Line by Newport News Shipbuilding and Dry Dock Co.
- BACK COVER: A safety reminder illustrates an easy way to become a casualty. Courtesy National Safety Council.

#### CENTER FOLD

The Reader's Questionnaire, found between pages 214 and 215, is concerned with the "Proceedings of the Merchant Marine Council." It would be appreciated if you would fill out the questionnaire and return it by December 15, 1968. The form can be easily detached, folded, and stapled. The address is printed on the form, and no postage is necessary.

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## PROCEEDINGS

#### OF THE

MERCHANT MARINE COUNCIL

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The Merchant Marine Council of The United States Coast Guard

Admiral W. J. Smith, USCG Commandant

Page

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November 1968

# A REVIEW OF MARINE CASUALTIES 1968

Captain Winford W. Barrow USCG Chief, Merchant Vessel Inspection Division, Headquarters

ONE OF THE vital tools of efficient management, both in marine transportation and in other industries, is an established set of criteria for measuring the results of the effort being expended. One criterion measures things accomplished or produced. These are the successes of a project. In the administration of the maritime safety laws of the United States one useful criterion is the measurement of the failures instead of successes. The safe, accident free passages go unreported. Only the failures in the form of reportable marine casualties are received, investigated, and analyzed for information from which vital guidance and evidence of the success of the program may be assessed. Although this process has an aspect of negativism, it can be a vital and constructive management tool if prudently interpreted and properly used. It was a wise ancient who said, "The past is prologue."

As you may note during the presentation of each of the following casualties, some of the accidents occurred during previous years but the need for careful review hy all elements involved has delayed the final From an address before the 1968 Marine Section, of the National Safety Congress and Exposition.

determination of the cause of the casualty.

The marine casualties investigated and acted upon during this past fiscal year have been both varied and unique as to the type of casualty, the type of vessel, and its location. From the sinking of the *Daniel J. Morrel* in Lake Huron, to the breaking up of the Liberian *Ocean Eagle* in the Caribbean, to the continuing casualties on the inland waterways of the country, and reaching to the far Pacific every body of water has contributed to the casualties reported.

#### POLLUTION AGAIN

Memories of the Torrey Canyon disaster were revived in San Juan Harbor in March of this year, when the Liberian tanker, SS Ocean Eagle, laden with a cargo of 19,000 tons of crude oil, broke in two at the harbor entrance, and spewed 3.5 million gallons of its cargo into the harbor and adjacent beaches. As the ship ap-

proached the harbor entrance buoys, the pilot made several attempts to board her but was unsuccessful hecause of the high following sea and way on the vessel estimated at 4 knots.

After the master had anchored the vessel, which continued to rise and fall in the sea, the pilot was able to board her on the port side. During this period the vessel struck bottom probably three times in quick succession. On the third occasion the vessel sagged amidships and oil began to flow from the deck in the vicinity of the aft cargo tanks. After an unsuccessful attempt to ground the vessel and with the anchor still down, the master gave the order to abandon ship. The vessel rapidly settled on a northerly heading into the sea, while oil poured out of the hull as the deck rose and fell. Within 3 hours, the two sections of the Ocean Eagle parted. The stern section drifted southerly toward shore and foundered. The bow section remained anchored. After several unsuccessful attempts both sections were towed to sea and sunk after salvage of about 2.2 million gallons of cargo.

The pollution from this casualty spread oil a distance of 16 miles along San Juan Harbor and caused millions of dollars in lost tourist revenue.

The Pacific Ocean took its toll of casualties, with the flooding and sinking of the SS *Panoceanic Faith* on October 9, 1967, with the loss of 36 lives and the grounding and subsequent stranding of the tankship  $R. \ C. \ Stoner$ , while attempting to moor to offshore buoys at the entrance to the Wake Island small-craft harbor.

Before attempting to moor, the Stoner-an 11,600-ton tanker-hove to off Wake Island for 3 days, waiting for favorable weather. On the morning of September 5, with a 10- to 12knot onshore wind, seas of 1 to 2 feet and swells of about 3 feet in height, the master felt that he could make the moor safely. The starboard anchor was dropped, a how wire made fast to the mooring buoy forward, and an LCM proceeded to the after mooring buoy with a stern wire. Upon reaching the buoy the wire was lost. The stern wire was then retrieved aboard the ship, payed out to the LCM, and again run to the stern buoy. By the time it was secured the stern was drifting to shore and inshore of the line of mooring buoys. The stern winch was unable to take up on the wire in order to move the stern away from shore and closer to the stern buoy despite the small craft pushing on the port quarter. It was decided that a second stern wire to an additional stern winch was needed. The first stern line was slackened to bring the mooring buoy above the water, and the second wire was connected to a different winch. Both stern lines were taken up but the port quarter continued to drift to the reef. With the engine on full ahead and with full left rudder the starboard anchor chain parted and the bow of the vessel set toward shore riding over the bow buoy. The vessel could not be maneuvered clear, so she grounded and subsequently stranded.

Capt. Winford W. Barrow, Chief, of the Merchant Vessel Inspection Division, at U.S. Coast Guard Headquarters, is a 1945 graduate of the U.S. Coast Guard Academy.

Captain Barrow's marine inspection career began in 1950 at the port of Baltimore and continued at various other ports including Jacksonville and Tampa until in August 1965 he was assigned as Assistant Chief, Merchant Vessel Inspection Division at Coast Guard Headquarters. He was promoted to his present position in July of 1967.

The pollution resulting from the subsequent spillage of JP-4 diesel oil and aviation fuel taxed the facilities of the island personnel. The pollution cleanup was assisted considerably by the passage of typhoon Sarah directly over the island about 10 days after the stranding. The report indicates that the effect of the typhoon was literally a scouring of the shoreline, cleaning it of an estimated 95 percent of the pollution. Both of these casualties have spurred the intensive study of water pollution already underway following the Torrey Canyon disaster.

We in the Coast Guard are actively working with the Federal Water Pollution and Control Administration in developing contingency plans covering all aspects of possible future water pollution. In the interim the Secretary of the Interior has asked the Coast Guard to serve as the onscene control authority in all spills that precede the final plans.

#### 36 MEN LOST

The other vessel claimed by the Pacific Ocean this year was the 8,000ton C2-type SS *Panoceanic Faith*, proceeding from San Francisco to Bombay, India, via Yokohama, Japan, loaded with 10,200 tons of bulk ammonium sulphate. On October 4, 1967, the master radioed the owners that the vessel was encountering heavy weather and the average speed since departure was only 8 knots. It was reported that the

forward spaces were flooding and weathertight doors and portholes in the forward part of the midship house were leaking. By October 6, the vessel was shipping heavy seas forward. In the early afternoon of the seventh the tarpaulin on the starboard forward corner of No. 1 hatch was adrift and the corner of the hatch pontoon was exposed. On October 8, the vessel was down by the head and a starboard list was developing. As the weather did not improve a shortage of fuel and water developed. Advice concerning a bunkering port was requested from the owners as the vessel's speed made good was only about 4 knots. There is no information that the master came about to ease the strain on the vessel, or to provide a lee in order to check the condition of the forward spaces, or secure No. 1 hatch until the early morning hours of October 9. Then, approximately 5 days after first reporting to the owners that the vessel was encountering beavy seas and high winds several attempts were made to bring the vessel about. These attempts failed as wind and sea conditions forced the ship back to a westerly heading. At 0618 the Panoceanic Faith requested any ships in the area to stand by for assistance. By 0820 she reported that immediate assistance was required; by 0905 that the seas and swells were intensifying, that she was developing a heavy starboard list and was unable to maintain lube oil suction or increase speed due to boiler trouble. When aircraft arrived shortly thereafter they found the vessel listing with the forward deck awash. A 0958 the vessel sent her first S O S. The master ordered the vessel abandoned and the engineroom evacuated soon after 1415, October 9. Unfortunately, the vessel was listing to the windward side. The lifeboats on the low side could not be released due to sea and swell and the lifeboats on the port or high side could not be lowered due to the list. As a result of of the casualty 36 of the 41 crewmem-



The stranded tanker R. C. Stoner, as seen from the closest point of land on Wake Island. Blackened stack is the result of wind-blown pollution, which is also noticeable in the water.

points on its starboard bow 6 miles off

and correctly assessed the situation as

bers on board were lost. The report of the Marine Board of Investigation is under review at this time.

#### COLLISIONS AND RADAR

The year's toll of serious casualties included several low-visibility collision cases involving radar. It is regrettable and disturbing that the false sense of security afforded by radar is emboldening masters and pilots to proceed at excess speed during periods of reduced visibility. Many times, excess speed is coupled with the failure to adequately plot the targets that appear on the radar scope. One such casualty occurred under a shroud of fog that reduced visibility to about one-half mile. Two radarequipped oceangoing freight vessels collided at a closing speed estimated at 26 knots. The SS Silver Shelton observed the SS Fairland on radar 2

a seagoing vessel on an approximately reciprocal course. Without benefit of radar plotting, the Silver Shelton pilot decided to cross the other vessel's bow and effect a port-to-port passage. Successive course changes to the right from the base course of 160° failed to effect the maneuver and at collision the vessel was heading 198° True. The Fairland, which had maintained a steady course until seconds before the collision, struck the port side of the Silver Shelton at an angle of about 30°. The Silver Shelton, in light condition and flooding in No. 1 hold, assumed a 20° list and was subsequently beached. It is an ironic fact-but not an infrequent occurrence in such cases-that the investigating officer concluded that had the Silver Shelton maintained her

original course of 160° both vessels would have safely met starboard-tostarboard at a distance of one-half mile. The intent of avoiding a close quarters situation which precipitated the Silver Shelton's course change to the right actually created a collision situation that did not originally exist but was created and tragically completed moments later. The Commandant dealt with a similar problem in his action disposing of a recent casualty wherein the U.S. freighter SS Arizona collided with the Japanese coastal tanker Meiko Maru.

That casualty occurred during the early hours of August 2, 1965, when the U.S.-flag SS *Arizona*, a marinertype freight vessel, while traveling at 17 knots in visibility described as ranging from zero to several hundred yards collided with an object that was not identified on radar. While damage



Evidence of fire damage is apparent on the SS Gulfsupreme's hull following a collision with barges in tow of the tug Kate Malloy.

to the Arizona was considered moderate, it was determined that she had collided with a 995-gross-ton Japanese coastal tankship which apparently was one of a number of targets in the area. All but one of the crew of 19 lost their lives on the Japanese vessel. The investigation concluded that neither vessel was proceeding at moderate speed considering the conditions of reduced visibility and the darkness of night in a heavily trafficked area.

The Commandant in his action made the following comments: "Reliance upon radar in periods of reduced visibility in areas of heavy traffic to the exclusion of the statutory Rules of the Road and the Radar Annex of those Rules cannot be condoned. The recommendations in the Radar Annex clearly caution the prudent mariner that the statutory requirement for proceeding at moderate speed may mean that where there are radar indications of one or more vessels in the vicinity, 'moderate speed' should be slower than a mariner without radar might consider moderate under the circumstances. The mariner who fails to properly utilize radar can expect to be held accountable for this failure in the same manner as for any other neglect or disregard of the requirements of good seamanship. This proper utilization may, in certain instances, call for plotting targets, analyzing the information, and taking prompt, early positive action as recommended in the Radar Annex to the International Rules of the Road."

This means that in the investigation of a radar-equipped vessel collision, the Coast Guard will more carefully and critically evaluate the use or nonuse of radar as the anticollision aid for which it was primarily designed. In addition, other steps appear warranted and are being given consideration.

The Coast Guard for a number of years required that the licensed officer serving on inspected radar-equipped vessels of 300 gross tons and over in ocean and coastwise service be<sup>\*</sup> a qualified radar observer. However, persons who do not raise their licenses and who serve on uninspected vessels do not require a radar observer endorsement. The continuing number of radar-involved low-visibility collisions has required a reappraisal of this policy. It would appear proper that the Coast Guard take whatever steps are within the limit of present statutory authority in order to insure that as many personnel as possible be examined and found qualified. Accordingly, there are under consideration, at this time, additional regulations to require licensed officers to successfully complete a radar observer exercise upon renewal of their licenses. It is strongly hoped and urgently recommended that all segments of the industry will give these proposals their fullest cooperation and support.

#### THE MORRELL CASE

The Great Lakes was the scene of a tragic marine casualty, when the 60-year-old SS Daniel J. Morrell, en route from Buffalo, N.Y., to Taconite, Minn., in ballast, broke up and sank at the height of a storm, reported to have been unusual in its severity and intensity. The sinking was so sudden that a distress message could not be transmitted due to the failure of electrical power, and neither lifehoat could be launched. Of the 29 crewmembers on board at the time, only one person survived. The wreck was located in 200 feet of water. The Board found it necessary, to aid in determining the cause of the casualty, to use underwater diving and television picture relays of the sunken stern section. In addition, a large section of the sheerstrake and a small section of deck plate were recovered and subjected to metallurgical study. This enabled the Board to determine that the fracture sustained was "Brittle fracture typical of many prior ship fractures in pre-1948 steel." The loss of the Morrell triggered a number of actions not only to prevent a

recurrence but also to minimize the loss of life should another such casualty occur. The Commandant, in commenting on the report of the Marine Board of Investigation, called attention to the fact that the average age of the Great Lakes bulk carrier fleet is about 45 years. There are more vessels in the 50- to 60-year age group than any other 10-year period. While it is true that corrosion of steel under the fresh water conditions of the Great Lakes is minimal, fatigue as a result of repeated stress cycling over a long period of years can and does result in local structural deterioration in the form of fatigue cracks. This type of deterioration may be difficult to detect despite diligent inspection. Because of these conditions it must be recognized that the remedial steps necessary to reduce the possibility of recurrence of this tragedy must involve all groups concerned. The vessel's loading, discharging, and ballasting must be such as to minimize stress. Full allowance and consideration must be given to the restrictions that adverse weather will place upon the vessel. The operation, maintenance, and husbanding of the vessel must at all times give full recognition to these factors and therefrom result in prudent, careful operating procedures and practices. Safe operation of the present Great Lakes fleet will require the efforts of all groups and individuals involved.

#### FIRE ABOARD

Fire on a vessel at sea is a deadly and fearful experience. When that vessel is a tanker which contains the fuel for a holocaust the potential for disaster is ever present. In October 1966 the SS *Gulfstag*, a jumboized T-2, suffered a fire and explosion while carrying a cargo of gasoline, diesel oil, and solvent and subsequently was abandoned and thereafter capsized. The casualty claimed eight lives and injured two other members of the crew.

After completion of cargo loading operations, several inches of liquid

gasoline and water remained in the after pumproom bilges. This was not removed before sailing. The pumproom doors and power ventilation blowers were secured. It was concluded that the probable cause of the casualty was an explosion of gasoline. vapors in either the after pumproom or the engineroom spaces. The source of ignition could not be determined. Review of the record indicated that there were two distinct explosions. The initial explosion also caused an electrical power failure which prevented the use of the vessel's electrically driven fire pumps. The second explosion blew off the top of the pumproom. The fire prevented anyone from reaching and activating the remote release of the fixed carbon dioxide extinguishing systems for the engineroom and after pumproom. The fire continued to burn in the after part of the ship until the stern settled and the vessel capsized.

#### TOWING MISHAPS

The mystery of the sea and the many vessels that have disappeared without a trace even in these modern times are legion. One such case involved the disappearance of the uninspected towing vessel M/V Southern Cities in the Gulf of Mexico with the loss of her entire six-man crew.

The Southern Cities, towing a Coast Guard-inspected seagoing barge was en route from Freeport, Tex., to Tuxpan, Mexico. The last communication from the vessel in the Gulf of Mexico was on November 1, 1966, when other vessels in the same area were reporting winds from the northwest at 30 to 40 knots with seas of  $9\frac{1}{2}$  to 13 feet. The owners requested Coast Guard assistance in locating and establishing communication with the vessel after the vessel failed to make two scheduled daily reports.

A search covering 84,600 square miles was conducted, and the barge was located drifting 105 miles off Tuxpan, undamaged and with her cargo intact and towline still made

fast. Other than a life preserver, part of her nameboard and a lifering, no other debris or equipment of the Southern Cities was located. The lost vessel was an uninspected, welded steel, single screw, diesel-propelled unit of 85 gross tons built in 1942. It had never been in class with any classification society, nor were any of the crewinembers required by law to be licensed or certificated by the Coast Guard. However, the 27-year-old master did hold a license for inland vessels under 100 gross tons. There was no evidence that the Southern Cities had ever engaged in other than inland service until July 1966. The Southern Cities had experienced difficulty on three of her first four seagoing voyages before heing lost on the fifth. One voyage encountered heavy weather, and, despite newly installed rubber gaskets, the deck doors admitted great quantities of water to the engineroom. Some water also leaked into the engineroom through faulty electrical fixtures on the main deck astern, where freeboard was about 3 inches. On this fourth voyage the master, who was not aboard on the ill-fated final voyage, exhibited fear of losing his tow and capsizing. It is reported that the superstructure, which provided a large amount of sail area, coupled with the light draft of the vessel underlay these fears, especially when the vessel attempted to turn in heavy seas. Speculation by the Marine Board of Investigation included several possible reasons for her disappearance; all pointed to an unseaworthy vessel designed for inland towing and not suited by size, freeboard, or seaworthiness for the service in which she was engaged. The case added strong impetus to towboat legislation now before Congress requiring licensing of personnel and inspection of towing vessels.

On the early morning of Christmas Day last year, the tug Kate Malloy, while attempting to make up a tow of two loaded tank barges allowed the lead barge to collide with the anchored SS Gulfsupreme off Bursa, La., in the Mississippi River. There was no appreciable wind at the time of the casualty and estimates of the current in the river range from 31/2 to 6 m.p.h. After the barges had been loaded at a terminal at Ortrica, La., (about 11/2 miles north of the Gulfsupreme anchorage), the master of the Kate Malloy instructed his mate to back the doubled-up barges out into the river and string them out for the trip to Port Arthur, an operation which had been performed several times before. While backing down against the current, one barge was allowed to drift around to the stern of the other by pivoting on one securing line. As the tug backed against the swift current and while moving down and across the river, the mate on the Kate Malloy realized he was unable to control the downstream movement of the tow. The current caught the tow abeam and drove it downstream into the Gulfsupreme's extended port anchor chain and bow. The ensuing fire involving the crude oil cargo on the tank barges caused threequarters of a million dollars damage to the tanker and the two barges and serious burns to nine crewmembers aboard the Gulfsupreme. More than 3 hours were required to bring the fire under control. As the fire advanced to engulf the Gulfsupreme, the master of the tanker got his vessel underway and separated from the source of the fire on the barge within 4 minutes. This quick action probably saved the ship and averted a possible explosion. The Coast Guard investigation found evidence of negligent operation on the part of the unlicensed operator of the tug.

On January 16, 1968, the shock of exploding gasoline turned a section of the 25-mile Houston Ship Channel—one of the Nation's busiest such waterways—into a mass of floating flame. A Liberian freighter, the M/V *Christianne*, was underway when it struck the first and second barges of a tow being pushed by the uninspected tugboat *Barbara Waxler* shortly after midnight. The lead tank barge was empty of cargo but was not gas free while the second and third barges in

the tow carried 30,000 barrels of gasoline. After the collision two of the barges broke loose, wrapped around the bow of the Christianne and exploded and burned, throwing sheets of fire and debris upon the deck of the freighter. Most of the crew was forced to abandon by lifeboat while flame and debris from the exploding barge were strewn across the channel, blocking navigation. A fortuitous coincidence accounted for rapid response of firefighting equipment to the scene of this fire. Some 2 hours before the collision an explosion had rocked a chemical plant 40 miles away. The facilities of the Houston Coast Guard Captain of the Port and the Channel Industries Mutual Association were already on the scene for this incident and were quickly dispatched to the scene of the channel collision. Within 7 hours, all fires had been extinguished with the assistance of waterborne firefighting equipment.

#### LEGISLATION NEEDED

I have presented here a summary of some of the significant marine casualties that have been published by the Coast Guard during the year. Some are single incidents that point to remedial steps in the narrow field of the specific casualty. In my treatment of individual casualties. I have indicated steps that the Coast Guard has taken to help reduce the possibility of similar accidents. This is, after all, our primary reason for the investigation of these casualties. We are fortunate that in many cases we are able to take positive action. But not all such corrective action is within the present statutory authority of the Coast Guard, and unfortunately the year has not been productive in implementing some remedial steps necessitated by casualties which point to broad patterns of problem areas.

For example, our proposals for VHF Bridge-to-Bridge Radiotelephone and unified Rules of the Road have not been enacted. Problems associated with agency review of these proposals delayed their submission to Congress until late in the session. The first measure would provide a clear, rapid communications capability to assist vessel operators in reaching meeting and passing agreements before the risk of collision developed, while the latter measure would coordinate and unify the various Rules of the Road which have in the past been separately enacted and were each applicable to different bodies of water. This unification will clarify and simplify universal understanding of the rules while retaining safeguards addressed to operations peculiar to specific local areas.

Most disturbing, however, is the fact that another year has passed with the inequity of towboat hazards on our waterways going uncorrected. Lack of statutory authority has been the reason diesel towboats are subject to neither inspection nor licensing of operators. This contrasts unfavorably with other safety regulations where, in the air, all aircraft are inspected and all pilots are licensed. Similarly on our highways all vehicle operators are licensed, and vehicle safety inspection is widely accepted. The towboat legislation under consideration by the Congress is in two parts. One statute under consideration would provide for licensing of towboat operators and the other would provide for an inspection program which, among other things would prevent vessels such as the Southern Cities from operating on waters for which they were not designed.

It is hoped that the next session of Gongress will give active and favorable consideration to the safety legislation proposals that I have mentioned. Given this, together with continued goodwill and cooperation of all elements of the industry, it can be expected that maritime safety, conservatively and wisely administered. can fully meet the public interest, while at the same time recognizing the economic and operational realities of each contributing element of the industry. The Coast Guard, as in the past, is dedicated to that philosophy. Ł

## Safety Awards



The SS Stella Lykes was awarded the National Safety Council's Award of Merit and Jones F. Devlin Award in July. The ship was honored for completing 362,736 man-hours without a disabling injury during a period from January 1, 1965, to December 31, 1967. Shown here is Edward N. Lennox, First Vice President of the Metropolitan New Orleans Safety Council (right) presenting the awards on behalf of the National Safety Council to R. T. Reckling, Vice President of Lykes Bros. Steamship Co., Inc. A total of 14 Lykes ships won recognition for outstanding safety records in 1967, 13 of them receiving Certificates of Commendation. All the vessels were free of lost-time injuries in 1967.

#### November 1968

## maritime sidelights

### Booklet Released

The Inter-Governmental Maritime Consultative Organization (IMCO) has issued a booklet called "Servicing Stations for Life-Rafts," reports from London say.

It is based on information provided by IMCO member countries and lists stations set up to repair inflatable liferafts and, in addition, carry out periodic surveys of these craft.

The station operators' names, addresses and telephone numbers are given, together with details of the types of liferafts handled. The stations are listed in geographic areas, which, says IMCO, broadly correspond to the oceans and large sea areas. A map permits easy reference, and there is also an alphabetical index covering towns. **‡** 

#### Marine Safety

A new program of research for improving safety in maritime industry operations has been set by the marine section of the National Safety Council. According to an announcement by section general chairman Joseph Andreae, the program will include research on safety problems and practices in cargo containerization, oil pollution and off-the-job accidents among marine personnel.

A new section committee on research and development was created by the group with Capt. Hewlett R. Bishop, executive vice president of the National Cargo Bureau, as chairman.

£

### nautical queries

#### DECK

Q. What measures should be taken after washing dishes and eating utensils to ensure that they are in a sanitary condition?

A. After a thorough washing, eating and drinking utensils should be subjected to an effective bactericidal treatment, by one or more of the following methods:

(a) By immersing the utensil or equipment for at least 2 minutes in clean hot water at a temperature of at least  $170^{\circ}$  F., or for one-half minute in boiling water (212° F.).

(b) By immersing utensils or equipment for at least 2 minutes in a lukewarm chlorine bath containing at least 50 ppm of available chlorine.

Note: ppm=parts per million.

Q. Where would it be dangerous to use the flame safety lamp?

A. Do not use the flame safety lamp in any place containing acetylene or hydrogen gas.

#### ENGINE

Q. Explain the pop action of the huddling chamber type safety valve and how the blow-down is set.

A. The face of the valve is extended by a projecting lip giving the escaping steam an increased area upon which to act as soon as the valve begins to open, and the resulting increase in the total pressure on the face of the valve overcomes the increased resistance of the spring. The valve, therefore, pops open quickly, and is held open until the pressure has dropped below that at which the valve opened. If the adjusting ring is screwed up to its highest point, the opening for the escape of steam is restricted, causing the pressure under the lip to be nearly equal to that in the boiler, with the result that the valve remains open until the pressure in the boiler has dropped well below the popping pressure. Conversely, if the adjusting ring is screwed down, the opening is made larger and the steam escapes more freely, with the result that the valve reseats as soon as the boiler pressure has dropped only a small amount below the opening pressure.

Q. What is a "flare-back" in an oil-fired boiler? What safety precautions must be observed to prevent "flare-backs"? What is the correct procedure when a "flare-back" occurs?

A. Flare-backs are the result of oil leaking or passing through an unlighted burner to the hot furnace walls, where it gasifies. Often, lighted torches have been carelessly applied to furnaces where such condition existed, and the resulting explosion has seriously injured personnel and done damage to the boilers. When ignited, the gas expands very rapidly and occupies such large volume that the escape which gives least resistance is back through the furnace fronts; hence the term "flare-back."

To prevent flare-backs, the fuel valves should be maintained in good condition, exercise care in closing the valves when cutting out fires, check valves to see that they are closed before applying torch. See that the furnace is ventilated before lighting fires when any doubt exists. When it is known that oil has leaked into the furnace, the blowers should be speeded up to clear boiler of gases, the front opened up and the oil cleaned out thoroughly before replacing the furnace in use.

When a flare-back occurs, the fuel valve should be closed immediately. The chances are that the explosion would have put the fire out; if not, it should be extinguished, the boiler well ventilated and any remaining fuel oil in the furnace should be cleaned up.

#### AIR EJECTOR

Q. Draw a diagrammatic sketch showing the flow-diagram through a two-stage air ejector and all attendant condensers.



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# **READER'S QUESTIONNAIRE**

# On Possible Changes to This Magazine

#### TO THE READERS:

The purpose of this questionnaire is to obtain opinions regarding the "Proceedings of the Merchant Marine Council." This magazine has been published by the Coast Guard for 24 years and distributed free of charge to interested parties in the maritime industrics. At the present time, we are evaluating the performance of the "Proceedings" and considering possible changes to the magazine. Your responses to the questions that follow will be of great value in helping us determine the best path for the Proceedings to take in the future.

The Proceedings has been published on a monthly basis throughout its history. Now, however, it may be necessary to reduce the frequency of publication, in the interest of economy. Consideration is being given to publishing the magazine every other month or quarterly, and the decision will be strongly influenced by the results of this questionnaire.

The Proceedings is devoted to the promotion of maritime safety, and it publishes a variety of material to achieve this goal. Among the most important content items of the magazine are notices of changes to Federal Regulations affecting the maritime industry. These notices are published on a regular basis following the appearance of changes to Regulations in the Federal Register. Other technical items regularly published include the following: Approved Equipment, Stores and Supplies, Affidavits, and summaries of Navigation and Vessel Inspection Circulars. All of this material comprises the latter part of each issue of the Proceedings. In addition, the magazine publishes news and notices pertinent to the activities of the Merchant Marine Council.

In recent years, much of the Proceedings has been de-

voted to lengthy feature articles on subjects related to marine safety. One regular feature is the publication of the National Transportation Safety Board and Commandant's action on significant maritime casualties involving American-flag vessels. These reports indicate the causes of accidents, in the hope that similar mishaps may be avoided in the future. Similarly, a regular department, Lessons from Casualties, briefly describes casualties and suggests ways to improve safety. Other regular departments include Nautical Queries, which provides sample questions for licensing examinations, and Maritime Sidelights, which carries short news and safety items.

This questionnaire has been prepared in two main sections. The first deals with the question of changing the publication schedule of the Proceedings. The second section, which is of a more general nature, is concerned with the contents of the magazine, as outlined above. The first section will tell us how often you—the readers—wish to receive the Proceedings and guide us in making a reasonable decision regarding the publication schedule. The second section will tell us how you feel about the contents of the Proceedings and help us produce a magazine which will suit your needs regardless of the number of issues published each year.

In order for a project such as this to give valid results, a large percentage of the questionnaires must be returned and the results tabulated. The questionnaire has been designed so as to require a minimum of your time in its completion. In order that we may complete our survey promptly, please fill out the questionnaire, detach it, and return it by DECEMBER 15, 1968. Your assistance will be much appreciated.

#### Section A

- 1. If the frequency of publication of the Proceedings were to be reduced, how adversely would you be affected by this?
  - 🗋 Not at all.
  - Little.
  - Quite a lot.
- 2. If it were necessary to reduce the frequency of publication, which of these publication schedules would be most agreeable to you?
  - Every other month.
  - Quarterly.

#### Section B

Following is a list of the various content items regularly published in the Proceedings. After each item, check the phrase that most nearly describes that item's usefulness to you.

-state

- 1. Notices of changes to Federal Regulations:
  - Very useful.
  - Moderately useful.
  - Of little use.
- 2. Activities of the Merchant Marine Council:
  - Very useful.
  - Moderately useful.
  - Of little use.
- 3. Summaries of Navigation and Vessel Inspection Circulars:
  - Very useful.
  - Moderately useful.
  - Of little use.
- 4. Approved Equipment, Stores and Supplies, and Affidavits:
  - Very useful.
  - Moderately useful.
  - Of little use.

#### 5. Feature articles:

- Very useful.
- Moderately useful.
- Of little use.

- 6. NTSB and Commandant's action on maritime casualties:
  - Very useful.
  - Moderately useful.
  - □ Of little use.
- 7. "Lessons From Casualties":
  - 🗌 Very useful.
  - Moderately useful.
  - 🗌 Of little use.
- 8. "Nautical Queries":
  - Very useful.
  - Moderately useful.
  - Of little use.
- 9. "Maritime Sidelights":
  - Very useful.
  - Moderately useful.
  - Of little use.
- 10. If you have further comments regarding any of the above items or on the "Proceedings of the Merchant Marine Council" in general, please state them in the space provided below.

Submitted by:

121

a pile

FOLD, STAPLE, AND RETURN TO:

DEPARTMENT OF TRANSPORTATION

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. 199.1

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STATION 4-8

### safety as others see it

# Climbing Ladders

Fear is a perfectly natural reaction to a dangerous situation or one that seems dangerous. It gives a person the extra strength and energy he needs to meet an emergency. If a person isn't capable of fear, he's abnormal something is wrong with him. The thing to be ashamed of is losing your head—losing self-control—from fear. Brave men get scared just like anyone else, but they keep their heads.

What does all this have to do with climbing ladders? Plenty. When you climb ladders, you should experience a degree of fear to make you careful. There are only a few things to be careful about, but you must never neglect any of them. Remember, a fall from a high ladder can easily be fatal.

Look the ladder over well before you start up. See anything wrong? Bent or missing rungs? Grease or heavy rust on rungs or rails? Any places where there isn't plenty of clearance? In below-freezing weather, check for ice.

After you've checked the ladder, you're ready to start up. Give it a good shake to make sure it's well secured, and look out for any looseness at each point of support as you come to it. In climbing, set your foot on the rung so that your heel is snug against it and close to the rail unless the ladder is too wide for that much spread to be comfortable. Don't crowd on ladders. They were not designed to carry everyone in the gang at one time. Grasp the rails. If you hold onto the rungs and a loose rung pulls out, you're probably a goner. Even if it turns a little, you may miss your grip. But if you have a good hold on a rail, a rung can let go under your foot and still not throw you. Always be sure you have a good grip with one hand and are solid with one foot before you take a new hold for the next rung. That goes for climbing either up or down.

Finally, when you hit the top, be sure of your footing when you step from the ladder to the deck.

In climbing down, be sure you have your foot placed securely on the rung below before you change your handhold. And *never* hurry on a ladder.

Courtesy of Lykes Lines

# Play It Cool!

There are probably as many methods of cleaning the fire sides of oil-fired watertube boilers as there are Chief Engineers. Existing conditions will dictate the best method to be followed; however, the final determination rests with the Chief Engineer who is always responsible for the maintenance and general condition of the boilers.

Recently a number of lost time accidents have been reported during various phases of boiler cleaning, usually attributed to burns, asphyxiation from gas fumes or heat prostration.

In all oil-burning boilers, accumu-

lation of slag, sulphates, soot, and carbon deposits must be periodically removed from the fire sides of the tubes for efficient operation and to prolong their life. The degree of accumulation and its nature will depend on the type of fuel burned, the nature of steaming and the maintenance of the boiler during the voyage.

Tubes located nearest the furnace generally require more attention than tubes in other locations although in some of the newer types of boilers superheater tubes and economizer elements are very susceptible to soot and slag build up, due to their being subject to high gas temperatures and less accessible to the built-in soot blowers.

The usual methods of cleaning are:

1-By manual hand scraping and brush.

2-By means of steam lancing.

3-By means of water washing.

There is a certain amount of hazard involved regardless of which method is used; therefore, it is imperative that men engaged in this work he protected by use of hard hats, goggles, respirators, gloves, and long sleeve shirts.

Whenever possible a boiler should be allowed to cool down for at least 24 hours after being taken off the line and care exercised to make sure that the fire side is free of gas fumes before sending men inside. An engineering officer should be first in to check conditions.

The majority of Chief Engineers prefer steam lancing over water washing, although either method is effective and hoth require identical safety precautions to be observed.

1—Fittings on either steam or water hose should be kept to a mini-\* = (Continued on page 222)

### STATISTICAL SUMMARY OF CASUALTIES TO COMMERCIAL VESSELS

	Nature of casualty																	
July 1, 1967, to June 30, 1968 Fiscal year 1968	Collisions; crossing, meeting, and over- taking	Collisions, while anchored, docking, or undocking	Collisions, tog	Collisions with plars and bridges	Collisions, all others	Explosions and/or fires- cargo	Explosions and/or fires- vessel's fuel	Explosions and/or fire- boilers, pressure vessel	Explosions and/or fire- structure, equipment- all others	Grounding with damage	Grounding without damage	Founderings, capsiz- ings, and floodings	Heavy weather damage	Cargo damage	Material failuro- structure and equipment	Material failure— machinery and en- gineering equipment	Casualty not otherwise classified	Total
Number of casualties Number of vessels involved Number of inspected vessels involved Number uninspected vessels involved	227 686 216 470	$     \begin{array}{r}       165 \\       422 \\       156 \\       266     \end{array} $	26 62 23 39	383 680 280 400	246 371 158 213	25 31 23 8	32 32 6 26	12 12 9 3	122 125 26 99	300 390 130 260	225 236 155 111	260 325 37 288	164 175 81 94	9 11 8 3	94 101 83 18	243 244 157 87	37 78 29 49	2, 570 4, 011 1, 577 2, 434
PRIMARY CAUSE	128				2			]	Numbe	r of ve	ssels							•
Personnel fault: Pilots—State. Pilots—Federal. Licensed officer—documented sea- man. Unlicensed—undocumented persons. All others. Error in judgement—calculated risk. Restricted maneuvering room. Storms—adverse weather. Unusual currents. Sheer, suction, bank cushion Depth of water less than expected. Failure of equipment. Unseaworthy—lack of maintenance Floating debris—submerged object Inadequate tug assistance Fault on part of other vessel or person. Unknown—insufficient information	24 5 69 149 24 3 12 12 19 19 11 351	3 4 9 35 12 14 4 45 7 3 8 45 7 3 22 10 222	1 18 13 3 3 	1 16 24 9 167 21 92 366 5 4 399 1 11 15 2322 1	3 2 20 41 12 42 5 23 4 1 34 1 34 1 34 1 8 2 70 2 90 2	4 1 11 3 3	2 4 	3 	1 12 10  1  1  	8 6 72 103 7 11 4 42 4 4 2 7 19 2 3 1 80 80 1	11 8 30 47 11 25 6 16 4 4 40 14 4 39 2 4 39 9 2	1 12 43 111 6 1 1 43 11 43 5 333 90 8 8 8 1 48 17	1 1 1 1 66 	22 	2 1 1 8 1 4 	222 1 2206 7 2 1 3 3	2 1 2 9 9 2 1 2 2 20  26 2	52 38 283 128 307 50 446 70 34 110 135 97 34 1,142 62
ADDITIONAL CONTRIBUTING FACTORS TO CAUSE OF CASUALTY	10)										100	1		1				
Hull and associated parts: Plates and framing—steel Planks and framing—wood Tanks Holds and hatches. Superstructure—bulkheads, decks Ladders, gangways, rails and guards. Masts, booms, and eargo gear Rudder and stern tube. Watertight closures. Quarters and living spaces Navigation and safety: Lackert	58 12 5	72 11 3 	34	60 3 6 1 4 1 1	39 23 3 2 10	78			1 3 7 7 1 5	46 17 4 1 	5	41 64 3 12 12 5 18	28 1 1 12 1 4 1 1 1 1	1	20 6 4 3 1 12 2 	1 1 1 2	18 2  1 	387 140 28 16 51 3 22 33 19 7
Docks-piers-congested area. Channels-restricted areas. Buoys-aids to navigation. Excessive speed. Poor visibility. Steering gear. Radar. Fathometer-depth of water. Engine order telegraph. Navigation equipment-other. Navigation signals. Weather (generally). Currents and tides. Lifesaving equipment. Firefighting equipment. Miscellaneous:	10 11 151 164 41 322 22 10 19 146 8 31 5	18 50 43 1 33 8 9 1 3 7 12 25 29 3	26 30 14 2 6 3	11 179 91 2 23 21 12 2 2 4 6 3 48 111 1	14 11 60 29 10 8 8 5 2 27 30	2	1		1	16 12 83 27 7 34 16 28 7 7 37 2 21 13	5 8 100 20 1 228 5 10 10 1 1 15 222	57 72 99 26 22 6 2 2 3 	2 1  1  4 	1	2 1 4 1 3 15	8		140 278 % 543 82 186 175 107 96 15 8 8 78 48 48 163 170 253 170 253 40 7 7
Tard repairs. Improper loading or stowage Tug assisting Anchor equipment. Towing equipment. Fishing equipment. Deck equipment.all other	66 1 6 1 3	36 5 12 12	1	1 99 5 12 35	2 36 3 15 7	11 	1		4 1 1	30 22 19 1 3	13 2 10 3	2 37 26 5 3 8 3	25 1 4 4 4	71	1 6 3 22 2 2	1 1 4 1	2 1 4 33	11 98 314 74 89 106 10
Engineering: Main propulsion machinery. Boiler parts and accessories. Machinery—all other. Tools and working spaces. Generators and other electrical	1	22 4		35 2	66 1 1		21 5	1 10	26 20 15	40	10	20 19 10 5	3	1	41	153 88 1	2	405 152 10 23
equipment. Wiring, lights, controls. Steward's department: Galley and steward's department equipment.	1					1 4	2 5 1	1	12 30 11	31	1	1			12	25 6	1	45 52 13

See footnote at end of table.

# STATISTICAL SUMMARY OF CASUALTIES TO COMMERCIAL VESSELS 1-Continued

									Nat	ture of	casualt	y		5 -	-	144	-	
July 1, 1967, to June 30, 1968 Fiscal year 1968	Collisions; crossings, meeting, and over-	taking Collisions, while anchored, docking, or	undecking Collisions, for	Collisions with piers	and bridges Collisions, all others	Explosions and/or fires-	Explosions and/or fires-	vessel's fuel Explosions and/or fire-	Explosions and/or fire-	all others Grounding with	damage Grounding without	damage Founderings, capsiz-	Heavy weather damma	Carro damasa	Material failure-	equipment Material failure—	gineering equipment Casualty not otherwise	classified
TYPE OF VESSEL							-					-	-					
Inspected vessels: Passenger and ferry—large Preight Cargo barge Tankbips. Tank barge. Publie. Miscellaneous. Cargo barge. Fishing. Tugs Cargo barge. Foreign Miscellaneous.		1 2 7 1 3 1 1 2 7 3 1 1 2 7 1 3 1 1 2 7 1 3 1 1 1 7 3 1 1 1 7 1 3 1 1 1 7 1 3 1 1 1 1	1 6 8 1 9 9 9 5 5 7 7 5 4 1 1 9 9 2 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1 3 1 7 5 3 1 9 3 5 2 1 1 1 7 5 2 1 1 1 7 5 2 1 9 3 5 2 1 1 9 3 5 2 1 1 9 3 5 2 1 1 9 3 5 2 1 1 9 3 5 2 1 1 9 3 5 2 1 1 9 3 5 2 1 1 9 3 5 2 1 1 9 3 5 2 1 1 1 1 1 1 1 1 1 1 1 1 1	4 4 1 1 5 4 9 1  9 2 8	1 2 1 9  2 1 2 1 2	2 3 1 3 8	8	1 4 14 1 2 1 3 45 1 23 8 3 3	4 7 42 8 42 8 42 8 14 1 25 3 35 1 35 1 12 4 82 3 15 1 34 1		8 11 4 3 2 7 7 5 7 8 0 1 8 	2 1 9 8 3 2 9 9 9 9  2	1 7 6 1 2	2 2 30 11 4 4 4 5 5 8 5 2 4	9 2 0 1 1 8 2 1 4 2 2 1 2 2 1	1 43 - 61 7 71( 2 96 3 227 5 351 1 64 7 672 8 850 2 170
GROSS TONNAGE					= = 3		3	5		20 1		2 3	3	4	-	2	2	7 271
300 tons or less Over 300 to 1,000 tons Over 1,000 to 10,000 tons Over 10,000 tons	325 158 151 52	194 67 119 42		1 199 3 230 3 209 1 46	0 17 0 7 5 8 3 38		4 2	8	3 9 5 2	00 20 9 6 1 9 5 3	00 8 16 3 13 8 11 6	7 24 5 6 3 1		3		5 91 6 10	2 22 3 28 3 25	1, 789 772 1, 051
LENGTH	-			-	=	-	1						=		s 20		====	399
Less than 100 feet. 100 to less than 300 feet	269 312 44 61	154 135 73 60	20 18 12 12	160 335 92 87	5 147 5 134 40 50		2	3 5 3 1	3 7 5 1 4	9 17 3 13 6 4 7 4	4 8 2 4 1 6 3 6		2 80 2 20 6 34				7 18 38 15	1, 537 1, 341 600
AGE	1								-				==		=	) 5( =	5 7	533
Less than 10 years 10 to less than 20 years 20 to less than 30 years 30 years and over	- 315 209 105 57	159 119 98 46	22 9 22 9	250 188 147 95	128 97 93 53	10 7 11 3		6 5 1 5	2 2 0 4 1	4 11 9 9 5 11 7 6	8 80 6 45 2 108 9 33	0 70 10 66 79	3 57 1 47 9 64 9 7			4( ) 4( 124) 2(	) 22 3 20 4 24 5 12	1, 346 1, 042 1, 103 520
LOCATION OF CASUALITY						20			Numb	er of C	asualtie	S	31				-	1
Inland—Atlantic	28 96 10 15 19 7 34 1 7	25 48 14 2 6 5 12 19 1 33	4 4 2 3 3 3 2 3 3 2 3 3 2 3 3 3 2 3 3 3 2 3 3 3 3 3 2 3	59 109 37 6 3 72 71 1 25	51 160 27 17 25 12 19 21 5 9	10 7 2 1 1 3 	5 8 10 5 5 5		$   \begin{array}{c}     3 & 20 \\     2 & 20 \\     1 & 20 \\     1 & 12 \\     1 & 11 \\     - & 14 \\     - & 17 \\     - & 1 \\     4 \\   \end{array} $	) 77 3 44 ) 57 9 32 20 1 19 27 6 11	$     \begin{array}{c}       3 & 59 \\       5 & 49 \\       7 & 44 \\       9 & 6 \\       3 & 7 \\       9 & 8 \\       7 & 19 \\       5 & 6 \\       22 \\       \hline       7 & 22 \\       \hline       7 & 22 \\      7 & 22 \\   $	34 71 34 19 31 24 8 42 1 1	2 80 2 33 3 28 4 4 8		8 99 44 6 23 11 4 11 13	20 13 28 40 52 54 13 1 8 14	3 6 3 1 1 4 6 13	407 630 302 154 206 217 191 253 45 165
TWE OF DAY Daylight Nighttime Twilight	95 127 5	96 61 8	14 12	214 146 23	135 99 12	10 13 2	20 11 1	84	67 47 8	146 144 10	127 78 20	132 118 10	86 72 6	5 3 1	68 24 2	147 80 16	23 11 3	1, 393 1, 050 127
Vessel	5, 650 407 138	9, 990 298 318	1,840 74 2	3, 064 228 5, 861	2, 592, 30 1, 314	1, 229 743 109	2, 414 1, 003 4	529	6, 775 15 4, 108	9, 664 252 271	95 13 23	11, 917 1, 217 374	2, 167 584 24	13 203 1	586 7 11	3, 612 98 3	1, 069 14 115	63, 206 5, 186 12, 676
Inspected	2 20	6	<u>-</u> 1	9	21	3 1		2	3 44	5 34		10 127	1 28		1		7	24 317

<sup>1</sup> Statistics concerning recreation and pleasure boating accidents are published in CG-357.



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

	-		-		Nat	ure of	casual	ty	-	2 1							L	
July 1, 1967, to June 30, 1968 Físcal year 1968	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, capsiz- ings, and floodings	Heavy weather damage	Cargo damage	Material failure	Material failure— machinery and engi- neering equipment	Casualty not otherwise classified	Total
Number of casualties	12	6	3		5	6	5	1	17	1		30			5	2	3	96
Number of deceased/injured-inspected vessels	/5	/10	/7			3/7	/1	/1	4/3	/1		38/			3/	/2		48/37
spected vessels	$\frac{22/2}{22/7}$	4/4 4/14	2/ 2/7		5/3 5/3	3/7	1/5 1/6	/1	$\frac{12/20}{16/23}$	/1		44/14 82/14			$-\frac{/92}{3/2}$	/2	$\frac{2/2}{2/2}$	92/52 140/89
PRIMARY CAUSE			7					N	umber	of cast	alties							
Personnel fault:	1/					1		1			1.1	1.25				03		1
Pilots—Federal																		
man Tiplicansed -undocumented persons	3 5	2	2		1	·····	1	1	5	1		8 5					1	12 23
All others	4	1			2	2			1			2			1		1	12 2
Restricted maneuvering room Storms_adverse weather												5						5
Unusual currents Sheer, suction, bank cushion												1					1	1
Depth of water less than expected Failure of equipment	1				11111	2	3		6			3			4	2		21
Unseaworthy—lack of maintenance Floating debris—submerged object												1						
Fault on part of other vessel or person		1				1			3									28
Unknown—insufficient information									0			2						
DEATH/INJURED BY VESSEL TYPE	12				-		Nı	imber (	of Pers	ons De	ceased/	Injured	-		-	1-	-	
Inspected vessels: Passenger and ferry—large Passenger and ferry—small Freight Cargo barge Tankships Tank barges	/5	/1	/6			/1 /1 /1 /1 /1	/1	4/2	/1	/1		2/ 36/			1/ 1/ 1/	/1		1/1 2/7 37/9 /1 1/11 3/6 4/2
Uninspected vessels:	1/		2/		3/2		/2		1/7			33/3					/1	40/15
Tugs	1/2						1/.		2/			3/3			/2		2/	9/5 17/5
Foreign Miscellaneous	8/	4/4			2/1		/3		4/10			8/8					/1	26/27
PARTICULARS OF FERSON DECEASED/INJURED			12								1			-		-		
Papers of deceased/injured: Licensed by Coast Guard Documented by Coast Guard No license or document	/1	/12 4/2	/1		1/1 3/2	1/2 2/5	1/	: ::/1	1/1 1/2 12/23	/1		16/3 66/11			3/	/2	2/	21/21 2/5 102/61 15/2
Status or capacity on vessel:	5/	12	/6		2/.					/1		4/						11/9
Longshoreman—harbor worker Crewmember. Other and unknown	15/7	-/12 4/	2/1		3/2 /1	2/4 1/3	1/6	/1	8/13 7/10			75/11 3/3			1/	/2	2/2	3/5 110/61 16/14
Off duty.	/1		1/1		/1	3/4	/2		5/2			2/3 46/4			2/_	/1	1/	9/8 65/29
Engine department duties	- 2/	/1					1/-	/1	1/4			1/1/1			1.1/	/1		5/8 2/6
Handling cargo		3/2							1/			20/			1/			1/1 24/2
Drills Passenger	4/	/1	/6.							/1		1/						5/8
Other and unknown Location of vessel:	- 4/1	1/1			5/2	/3	/3		. 8/11			. 11/ð					-/1	20/21
At dockAt anchor	-	/11			5 /0	- 8/7	/3	/1	- 3/4			3/1			1/	/9	2/1	7/16
Underway	- 22/7	4/3	2/1		5/3		1/8		- 1/12	/1		18/11			0/	/4	-/1	=
PART OF BODY INVOLVED	1/	1/5	12			1	/1	-	1/3			12					/1	2/1/
Back and lower limbs	/2	1/0	/-2		/2	2/5	1/8		2/15	/1		1/8				/2	/1	/18 6/56
Death-heart	- 8/	/-	- 2/		2/				1/			42/			1/			59/
Death-other	. 14/.				- 3/	1/			. 11/.			. 39/			- 3/		2/	73/

<sup>1</sup> Statistics concerning recreational boating accidents are published in CG-357.



. Aster.

# STATISTICAL SUMMARY OF DEATHS ON BOARD COMMERCIAL VESSELS 1

### (Not Involving a Vessel Casualty)

		_				16						1	Nati	tre o	f dea	ath							1		10	
	July 1, 1967, to June 30, 1968 Fiscal year 1968	Natural cause	Haminida		Surcide	Disappearance	Slips and falls-ladders	Slips and fails-gangways	Slips and falls-on deck	Slips and falls-other	Falls from vessel—into water	Falls into holds or tanks	Struck by objects; falling.	Exposure and asnhvyla.	tion Struck anginst emished	bumped into objects	tools	than electrical)	Electrical shock and burns	Caught in lines, chains, or wire ropes	Phnching and crushing	Heavy weather	Overexertion, sprains, and	Cuts, lacerations, bruises,	Altercations and miscon-	Unknown or insufficient information
Tota 43	CAUSE OF DEATH	21	3 3	2	7	3	9	1	2	13	125	8	25		6	2		2	1	1	_		-			
1 21 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	9       Intoxication         9       Physical deficiency or handicap         9       Unsafe movement or posture         2       Psychologicalimmaturity, insanity         4       Unsafe practice         4       Violation of law or regulation         4       Human errors         5       Decks-slippery or cluttered         9       Weather conditions         9       Poor maintenance or housekceping         1       Inadequate lighting         1       Inadequate supervision         1       Inadequate lighting         1       Inadequate lighting     <	20	8 7 1 1 1 2 2 1 1 1 2 1 1 1 2 1 1 1 1 2 1		2	2	1 3	1	1	3 1 7 1 1 1 1	11 10 9 23 4 1 42 1 8 2 2 6 6 1	3		2				1	1	1	1					
49 18 159 33 4 18 55 43 20 35 248 160 26	TYPES OF VESSELS INVOLVED Inspected vessels: Passenger and ferry—large Passenger and ferry—small. Freight ships and barges. Tankships and barges. Public Miscellaneous. Fishing Foreign. Miscellaneous. TIME OF DAY Daytime Twilight	36 12 100 16 3 9 18 11 4 4 4 128 75 10	1			2	1 - 4	1	2	7 7 3 1 2 9 4	9 23 10 4 81 22 5 19 50 59 7	4 22 2 3 4 1	1 9 2 1 1 2 5 7 20 5 3	3 1 2 4 2	1			2		1	1 .				1	1 1 2 1 5 1
60 145 224 5 40 295 42 295 42 167 87 21 13 13 25 26 26 43 176 29 229	PARTICULARS OF DECEASED Papers of deceased: Licensed by Coast Guard. Documented by Coast Guard No license or document. Other—unknown—foreign Status capacity on vessel: Passenger Longshoreman—Harbor worker Crewmennber Other. Activity engaged in: Off duty Deck department duties Engine department duties Itandling cargo. Fishing Drills Passenger Other and unknown Location of vessel: At ack At anchor. Underway PART OF BODY INVOLVED	52 82 78 1 1 44 5 5 56 9 1 11 1 23 13 6 3 8 8 41 8 68 10 135	2 1 1 2 2	1 4 2 5 3 3 2 1 1 1 5	1 2 1 2 1					5 5 3 3 3 2 7 1	5 33 85 2 7 10 89 19 41 35 3 8 6 14 7 17 48 11 	2 5 1 2 5 1 1 7 7	5 22 1 12 9 6 1 11 12 9 6 1 1 1 1 8 22 1 5	1 2 3 3 3 3 3 1 1 1 1 1 1 1 2 3 3 1 2	2 1 1 2 2 1 1 1			1		i						
29 3 33 194 128 47	Head and upper limbs Back and lower limbs Multiple injuries (internal-external) Death—heart. Death—drowning Death—other	189 24	1	1	3	6 2 1	1	1	6 5 1 1	1	1 4 16 4	3 1	3	24	2		1	1	1	22		-				1

 $^1$ Statistics concerning recreation and pleasure boating accidents are published in CG-357.

November 1968

## STATISTICAL SUMMARY OF PERSONNEL INJURIES ON BOARD COMMERCIAL VESSELS<sup>1</sup>

(Not Involving a Vessel Casualty)

				24	16				1	Natu	ire of	inju	y		1			130		
	July 1, 1967, to June 30, 1968 Fiscal year 1968	Slips and falls-ladders	Slips and falls-gangways	Slips and falls-on deck	Slips and falls-other	Fails from vessel—into water	Falls into holds or tanks	Struck by objects; falling, dropped, or moving	Exposure and asphyxiation	Struck against, crushed, hummed into chiects	Operating machinery and tools	Burns and scalds (other than electrical)	Electrical shock and burns	Caught in lines, chains, or wire ropes	Finching and crushing	Heavy weather	Overexertion, sprains, and strains	Cuts, lacerations, bruises, and punctures	Altercations and misconduct	Unknown or insufficient information
Total 2167 43 500 2400 6 957 113 142 200 6 13 65 28 12 33 50 21	CAUSE OF INJURY Intoxication	6 8 16 23 140 0 0 4 3 3 1 1 1 1 1 1	4 2 25 3 3 	12 5 18 135 700 21 5 1 	7 3 43 2 29 102 15 5 22 22 102 16 6 6 6 6 6 8 8 3 4 1	3 32 2 6	2	1 6 6 2 47 155 1 21 21 21 5 1 42 9 2 10 11 12	3	1 4 29 2 6 6 7 20 3 1 1 1 1 2 2	1 11 11 1 1 4 2 3 3 3 2 13	1 6 21 1 39 32 1 2 4 2 2 2 2 3 3 2 4 2 2 2 3 3 2 3 2 3 2 3 3 2 3 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3	2		3 2 17 68 17 1 1 1 2 2	1 1 8	1 16 103 10 63 1 7 7 1 1 1 1	2 1 7 4 13 56 1 5 5 11 1 1	6	1 5 3 2 3 9 11 10 10 10 11 3 3 4 2 11
239 15 1556 158 16 30 80 51 1 21	TYPES OF VESSELS INVOLVED Inspected vessels: Passenger and ferry—large. Passenger and forry—small. Freight ships and barges. Public. Miscellaneous. Uninspected vessels: Fishing. Tugs. Foreign. Miscellaneous.	31 169 11 3 2 2 1	42 1	39 5 207 19 1 1 8 5	223 3 181 27 2 4 6 4	1 1 7 4 3	10  	31 2 227 17 2 9 20 16 1 6	1 3 	13 1 106 2 2 2 5 4	4 37 5 1 11 1 1 2	8 70 7 1 2 1	2	1 20 3 14 2	11 2 83 6 2 5 4	5 1	28 150 15 2 3 2 2 2	9 1 85 8 3 3	20 98 22 3 2 1	21 56 7 1 2 2
1, 513 557 98	TIME OF DAY Daytime Nighttime PARTICILLARS OF PERSON INHERED	145 63 11	20 23	187 89 10	177 65 7	8 8	7 4	249 69 13	4	99 33 8	55 5 1	72 15 2	3	29 10 1	83 24 7	4 2	170 30 5	72 29 11	56 78 13	73 10 8
166 1,825 176	Papers of person injured: Licensed by Coast Guard Documented by Coast Guard No license or document. Other-unknown-foreign. Status or cupacity on vessel:	12 200 7	1 42	16 252 18	84 200 15	3 8 5	2 8 1	22 259 50	3	8 123 9	9 40 12	18 67 4	12	2 20 18	6 96 12	42	12 189 4	7 96 9	7 133 8	1 85 4
17 13 2, 118 19	rassenger Longshoreman—harbor worker Crewmember Other Activity ongaged in:	1 218	43	7 276 3	3 1 245	2 14	11	3 8 315 5	4	2 1 135 2	60 1	89	3	39 1	1 111 2	6	1 203 1	112	145 3	89 1
846 471 355 7 37 19 15 26 898 115	Deck department duties. Engine department duties. Stewards department duties. Handling cargo. Fishing. Drilis. Passenger Other and unknown. Location of vessel: At dock. At anchor.	51 62 54 50 1 1 1 79 5	34 7 2  34 7	48 118 44 61 2 7 2 111 13	40 119 63 14 1 3 4 3 2 92	7 7 2 10	10 1 	16 209 52 27 4 11 6 2 4 172 16	4	35 42 34 21 2 1 2 3 50 6	26 29 4 1 1 16	7 16 49 15 2 36	3	28 3 7 2 19	18 37 24 29 1 3 2 47 47	3	18 90 61 33 1 1 3 1 2 76	14 50 35 11 2 85	95 13 9 29 29 29 29 29 29 29 29 29 29 29 29	10 8 7 63 1 1 24
1,154	Underway	135	2	162	143	2	3	143	4	84	42	47 -	2	21	60	6	122	70	46	60

See footnote at end of table.

" Alegar

# STATISTICAL SUMMARY OF PERSONNEL INJURIES ON BOARD COMMERCIAL VESSELS'-Continued

#### (Not Involving a Vessel Causalty)

		14	1	1.25	211				1	Natu	re ol	inju	ry						1	
Total	July 1, 1967, to June 30, 1968 Fiscal year 1968	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	Altereations and inisconduct	Unknown or insufficient information
115 97 160 431 262 308 285 98 74 24 291 22	Part of body injured: Head and neck Eye and face Arm and shoulder Hand Leg and hip Feet Back Body—external Body—internal Hermia. Multiple body injuries. All other injuries.	12 1 23 12 25 31 44 8 10 1 1 49 3	4 1 5 11 7 4 3 2 6	18 11 33 24 38 32 66 12 20 2 29 1	12 4 20 11 34 44 35 16 15 54 4	2 1 1 1 2 1 1 1 3 3 8	1 1 1 1 1 7	29 30 22 59 56 63 5 12 7 47 1	1	18 2 8 15 37 27 15 3 5 1 9	7 1 40 5 4 1 1 1 1 1	$1\\4\\8\\17\\3\\20\\3\\13\\13\\18\\2$	1	2 28 4 2 1 3	4 89 5 12 1 1 3	1 1 1 2  1	10 8 19 38 96 8 1 19 6	2 5 9 65 10 14 1 3	16 29 13 14 6 2 6 11 7 43 1	1 3 4 41 7 7 6 4 4 1 8 4
431 104 68 27 10 12 27 55 10 12 27 55 328 105 328 105 328 105 306 146 107 1388 41 11 12 11 12 11 12 12 20 175 109 109 12 12 75 10 12 12 75 10 12 12 75 10 12 12 75 10 12 12 75 10 12 12 75 10 12 12 75 10 12 12 75 10 12 12 75 10 12 12 75 10 12 12 75 10 10 12 12 75 10 12 12 75 10 12 12 12 12 12 12 12 12 12 12 12 12 12	ADDITIONAL CONTRIBUTING FACTORS TO CAUSE OF INJURY Human element	23 4 9 1 3 3 1 1 2 25 100 1800 8 7 9 2 2 1 1 1 1 1 3 3 1 17 1 17 16 3 3	7 1 2 1 1  9 9 34  1 2 	50 64 13 9 7 1 2 4 2 1 1 11 5 5 15 15 15 15 15 15 12 4 4 4 4 7 7 2 2 7 7 2 1 3 5 5 1 1 2 4 2 9 7 7 1 2 2 4 2 2 1 2 1 2 4 2 3 5 7 7 7 1 2 2 4 2 2 1 2 1 2 2 4 2 1 1 2 2 4 2 1 1 2 2 4 2 1 1 2 2 4 2 1 1 2 2 4 2 1 1 2 2 4 2 1 1 2 2 4 2 1 1 2 2 4 2 1 1 2 2 4 2 1 1 1 2 2 4 2 1 1 1 2 2 4 2 1 1 1 2 2 4 2 1 1 1 1	$\begin{array}{c} 34\\ 18\\ 10\\ 6\\ 7\\ 5\\ 3\\ 10\\ 1\\ 2\\ 2\\ 2\\ 2\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\ 9\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 1\\ 2\\ 1\\ 2\\ 2\\ 6\\ 4\\ 4\\ 9\\ 9\\ 6\\ 6\end{array}$	4 2 1 1 1 2 1 7 7 7 1 1 1 1 1 1 1 1 1 1 1 1 1	3 10 1 1 1 1 1 1	47 6 4 1 26 33 11 9 9 55 55 13 4 5 5 5 13 4 5 5 5 11 11 10 9 9 55 13 13 4 1 11 11 19 9 55 55 13 13 4 5 5 5 5 5 5 5 5 5 5 5 5 5	3	$\begin{array}{c} 28\\7\\4\\3\\\\\hline\\3\\4\\1\\1\\4\\8\\7\\1\\7\\28\\\\\hline\\1\\4\\3\\1\\1\\4\\3\\1\\1\\4\\3\\8\\\\\hline\\7\\28\\\\10\\8\end{array}$	$ \begin{array}{c} 15 \\ 1 \\ 2 \\ 2 \\ 1 \\ 2 \\ 1 \\ 2 \\ 1 \\ 2 \\ 5 \\ 1 \\ 2 \\ 6 \\ 6 \\ - \\ - \\ 1 \\ 2 \\ 6 \\ 6 \\ - \\ - \\ 1 \end{array} $	18       1       2       4       3       4       1       2       4       1       1       2       3       1    <		2 2 2 3 3 6  1 1 4 4 4 4 4 1 	22 1 10 10 2 2 5 8 7 7 46 10 2 2 5 8 7 7 46 10 10 10 10 10 10 10 10 10 10	1 1 1 1 3 3	$\begin{array}{c} 32\\ 2\\ 3\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 2\\ 6\\ 3\\ 10\\ 1\\ 1\\ 2\\ 6\\ 3\\ 1\\ 3\\ 1\\ 3\\ 1\\ 3\\ 1\\ 3\\ 1\\ 3\\ 1\\ 3\\ 1\\ 3\\ 1\\ 3\\ 1\\ 3\\ 1\\ 3\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\$	111 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	107 	21 32 21 32 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 1 2 3 - - - - - - - - - - - - -

<sup>1</sup> Statistics concerning recreational boating accidents are published in CG-357.

#### (Continued from page 215)

mum and must be thoroughly inspected prior to every use.

2—The steam lance or water nozzle should be fitted with a quickclosing cutoff valve so the man using it can close it if required. Also a man should be stationed outside at the boiler register to tend the root valve on the steam or water line and keep an eye on the man inside. If it is not possible for one man to do both, two men should be assigned. Steam or water pressure must be kept within safe limits.

3-All valves in cross-connected lines to steaming boilers should be closed, wired shut or locked, and tagged.

4—Regardless of the method of cleaning being used, effective supervision of this operation is the surest way to prevent an accident.

George W. Kroh, USP&I Agency

#### Circular

#### **NVIC 6-68**

"Recommendation on Intact Stability of Fishing Vessels" is derived from a document developed by the Intergovernmental Maritime Consultative Organization (IMCO) and is issued to provide guidance to naval architects, marine surveyors, and others involved in the safe design of fishing vessels. The lack of criteria on the intact stability of fishing vessels was recognized at the 1960 Safety of Life at Sea (SOLAS) Conference. For the past 4 years this question has been under deliberation by a Working Group in IMCO with some 20 countries taking part.

The material is not intended as regulation. It is being distributed as an advisory text in keeping with the Coast Guard's obligation to promote safety at sea.

Effective date—September 12, 1968.

Copies of this circular with enclosure (1) may be obtained at the local marine inspection office or by writing Gommandant (CAS-2), U.S. Coast Guard, Washington, D.C. 20591.

#### SOLAS 60 15-MINUTE ORANGE SMOKE SIGNAL APPROVED

A 15-minute orange smoke signal meeting the requirements of regulation No. 21 of SOLAS 60 and U.S.C.G. Specification Subpart 160.-057 has been approved. Certificate of Approval No. 160.057/1/0 has been issued to Superior Signal Co., Inc., West Greystone Rd., Spotswood, N.J. 08884, for its model OS-15, 15-minute signal. The required number of

#### ACCEPTABLE HYDRAULIC COMPONENTS

Nonductile hydraulic components which have passed high impact shock tests. Unless otherwise noted, the material is cast iron.

Manufacturer	Valve type	Identity	Maximum allowable pressure (p.s.i.)
Modernair Corp. 1105 Williams St. Angola, Ind. 46703	4-way valve.	5340-50-8.	200
Abex Corp. Denison Division 1160 Dublin Rd. Columbns, Ohio 43216	Relief unloading and sequence.	R1*-12-53.* R1*-24-53. R1*-32-53.*	5,000 5,000 3,000

#### NOTICE

REGULATIONS of the Congressional Joint Committee on Printing and Binding require annual verification of all mailing lists maintained for the purpose of free distribution of Government publications.

All addressees on the mailing list for the PROCEEDINGS have been sent a card requesting that an affirmative reply be returned to the Commandant (CMC), United States Coast Guard, Washington, D.C. 20591.

signals should be obtained and installed in accordance with the appropriate vessel regulations.

STORES AND SUPPLIES

Articles of ships' stores and supplies certificated from September 1 to September 30, 1968, inclusive, for use on board vessels in accordance with the provisions of part 147 of the regulations governing "Explosives or Other Dangerous Articles on Board Vessels" are as follows:

#### CERTIFIED

National Sales & Distributing Co., Post Office Box 8832, Baltimore, Md. 21224: Certificate No. 830, dated August 29, 1968, G. P. "66" COLD WASH.

Blankenship Marine Chemical Co., Inc., Post Office Box 590, Morristown, N.J. 07960: Certificate No. 831, dated September 3, 1968, RINSOL.

Drew Chemical Corp., 522 Fifth Ave., New York, N.Y.: Certificate No. 832, dated September 18, 1968, AMEROYAL.

#### AFFIDAVITS

The following affidavit was accepted during the period from August 15 to September 15, 1968:

A. O. Smith, Smith Plastics Division, 2700 West 65th St., Little Rock Ark. 72206, FITTINGS.<sup>1</sup>

<sup>1</sup>Limited to Green Thread Fittings for class II Piping with maximum allowable pressure of 130 p.s.i. at 225° F.

#### 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 may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Subscription rate is \$1.50 per month or \$15 per year, payable in advance. Individual copies may be purchased so long as they are available. The charge for individual copies of the Federal Register varies in proportion to the size of the issue but will be 15 cents unless otherwise noted in the table of changes below. Regulations for Dangerous Cargoes, 46 CFR 146 and 147 (Subchapter N), dated January 1, 1968 and Supplement dated July 1, 1968, are now available from the Superintendent of Documents, price: basic book \$2.50, Supplement: 20 cents.

#### 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. 12-6-66, 12-20-67, 6-1-68.
- 123 Rules and Regulations for Tank Vessels (5-2-66). F.R. 12-6-66, 12-9-67, 12-27-67, 1-26-68, 1-27-68, 2-10-68, 4-12-68, 6-1-68. 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.
- 172 Rules of the Road-Great Lakes (9-1-66).
- 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. 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, 12-23-67.
- 190 Equipment Lists (8-1-66). F.R. 9-8-66, 11-18-66, 2-9-67, 6-6-67, 6-14-67, 6-30-67, 8-29-67, 10-7-67, 4-16-68, 4-17-68.
- 191 Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel (5-1-68).
- 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).
- 249 Merchant Marine Council Public Hearing Agenda (Annually).
- 256 Rules and Regulations for Passenger Vessels (5-2-66). F.R. 12-6-66, 1-13-67, 4-25-67, 8-29-67, 12-20-67, 1-27-68, 4-12-68.
- 257 Rules and Regulations for Cargo and Miscellaneous Vessels (1-3-66). F.R. 4-16-66, 12-6-66, 12-13-67, 12-9-67, 1-26-68, 1-27-68, 2-10-68, 4-12-68, 6-1-68. 258
- Rules and Regulations for Uninspected Vessels (3-1-67). F.R. 12-27-67, 1-27-68, 4-12-68.
- 259 Electrical Engineering Regulations (3-1-67). F.R. 12-20-67, 12-27-67, 1-27-68, 4-12-68.
- 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.
- 270 Rules and Regulations for Marine Engineering Installations Contracted for Prior to July 1, 1935 (11-19-52). F.R. 12-5-53, 12-28-55, 6-20-59, 3-17-60, 9-8-65.
- 293 Miscellaneous Electrical Equipment List (4-1-66).
- 320 Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf (10-1-59). F.R. 10-25-60, 11-3-61, 12-28-61, 4-10-62, 10-13-62, 8-31-62, 4-24-63, 10-27-64, 7-29-65, 8-9-66. Rules and Regulations for Small Passenger Vessels (Under 100 Gross Tons) (1-3-66). F.R. 12-6-66, 1-13-67. 323
- 12-27-67, 1-27-68. 4-12-68.
- 329 Fire Fighting Manual for Tank Vessels (4-1-58).

#### CHANGES PUBLISHED DURING SEPTEMBER 1968

The following has been modified by Federal Register:

(No Change)

10

U.S. GOVERNMENT PRINTING OFFICE: 1968

Ρ.

