PROCEEDINGS

OF THE MERCHANT MARINE COUNCIL

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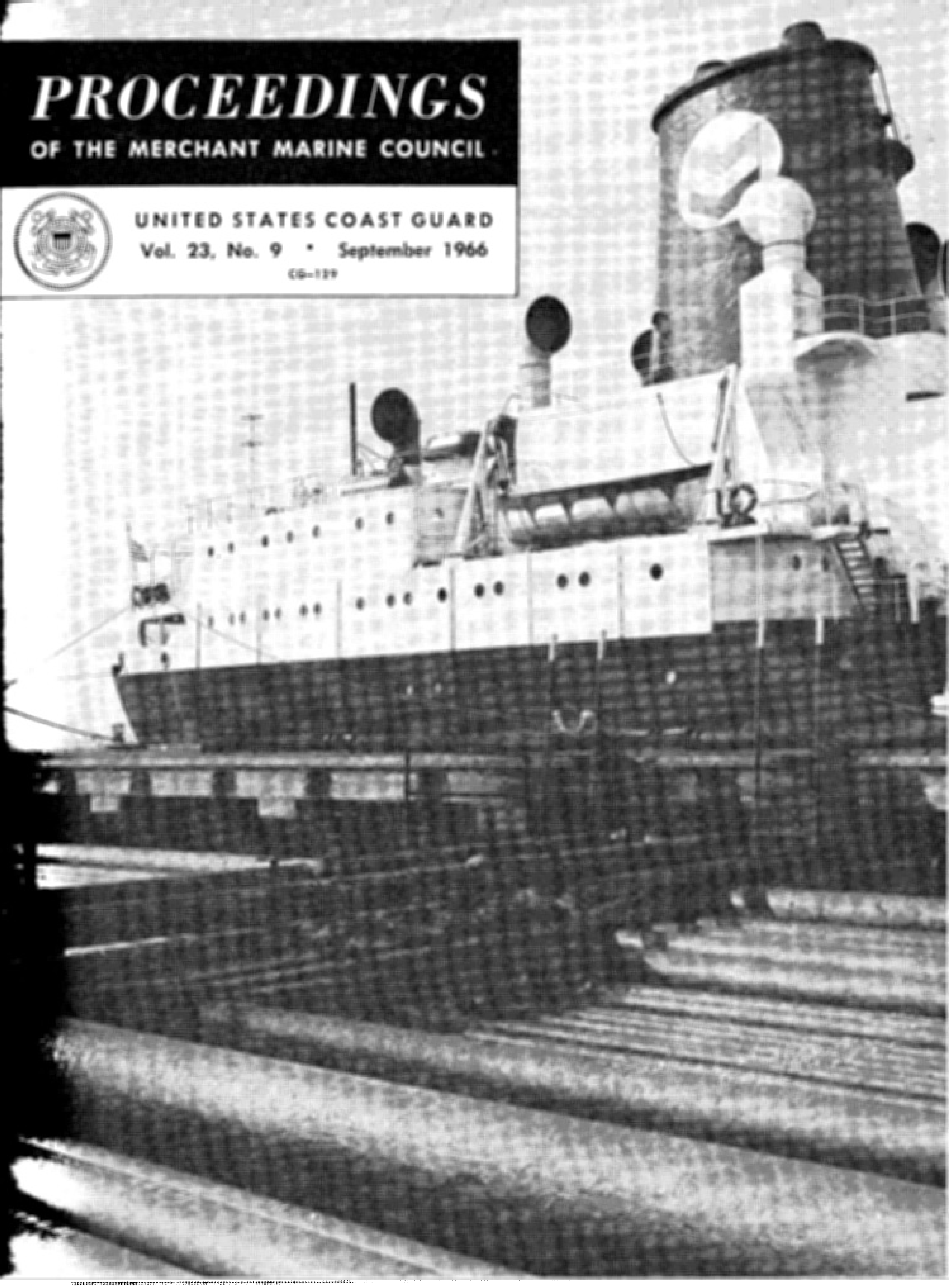

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COVERS

FRONT: The photograph shows the stack and after house of the SS *R.C. Stoner*. Courtesy Chevron Shipping Co.

BACK: A U.S. Coast Guard helicopter hovers over the stern of the Italian liner *Michelangelo* in the Atlantic Ocean to evacuate an injured crewman on April 15, 1966.

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PROCEEDINGS

OF THE

MERCHANT MARINE COUNCIL

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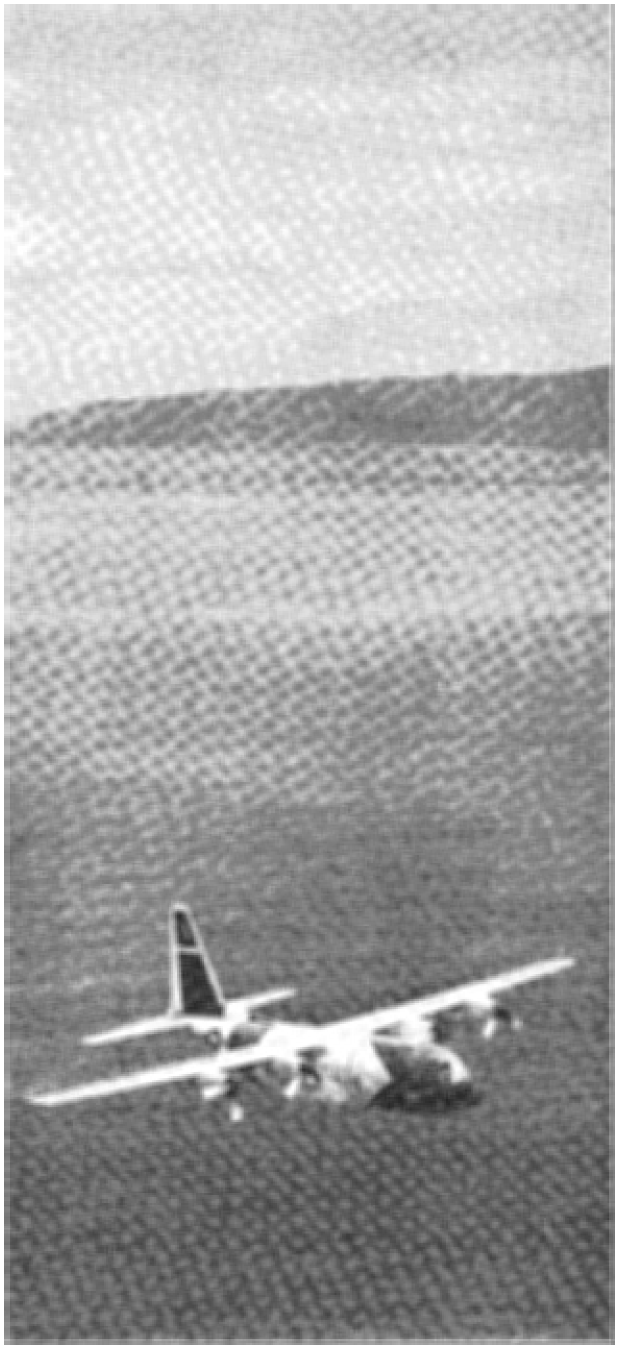
Half a Century of Coast Guard Wings

Hymen R. Kaplan



Coast Guard aviators have flown millions of miles, often in weather when other aircraft were grounded, to aid mariners in distress.

THE AGE OF flight was just 13 years old when President Woodrow Wilson, on August 29, 1916, signed into law an act establishing an "Aerial Coast Patrol." That was the beginning of a half century of Coast Guard aviation.

Since 1916, Coast Guard aviators have flown millions of miles on search and rescue missions, often in weather when other aircraft were grounded. Thousands of hazardous open-sea landings have been made to aid mariners in distress. Coast Guard aviation has been directly responsible for saving over 10,000 lives at sea.

The Coast Guard air arm owes its beginning to two young officers, Second Lieutenant Norman B. Hall and Third Lieutenant Elmer F. Stone. Assigned to the cutter *Onondaga*, they convinced their commanding officer, Captain B. M. Chiswell, that what the Coast Guard needed was a "flying surfboat." After "selling" Coast Guard officials in Washington on the idea, Captain Chiswell contacted the pioneer airplane designer, Glenn H. Curtiss, and persuaded him to design a suitable aircraft for rescue work at sea. The result was a triplane flying boat with short boatlike hull and with the control surfaces mounted high on the tail booms. This became the forerunner for the famed NC-4.

The aviation facilities provided for in the act of 1916 were modest. They consisted of ten air stations along the Atlantic and Pacific coasts, the Great Lakes, and the Gulf of Mexico. The Coast Guard was authorized to train its aviators at the Naval Air Station, Pensacola, Fla. That arrangement still exists and hundreds of Coast Guard fliers have received their wings at this facility.

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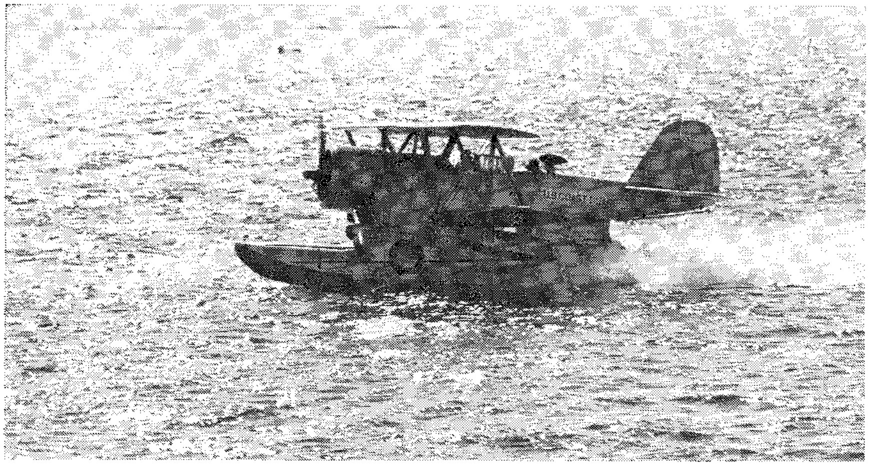
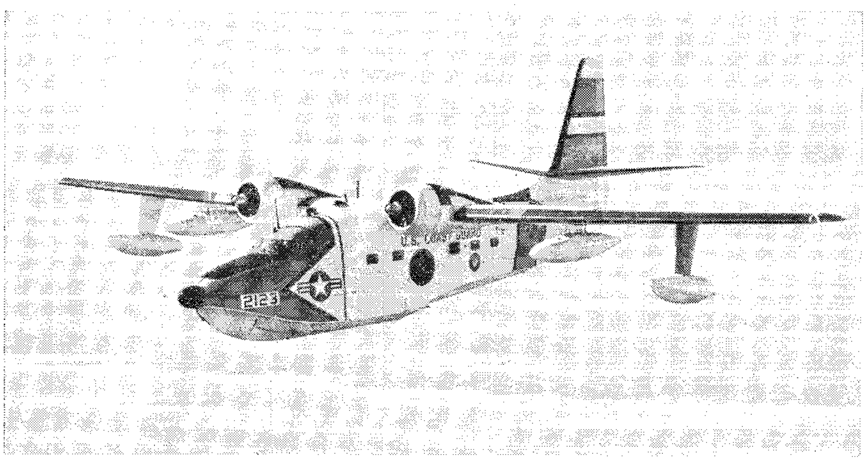
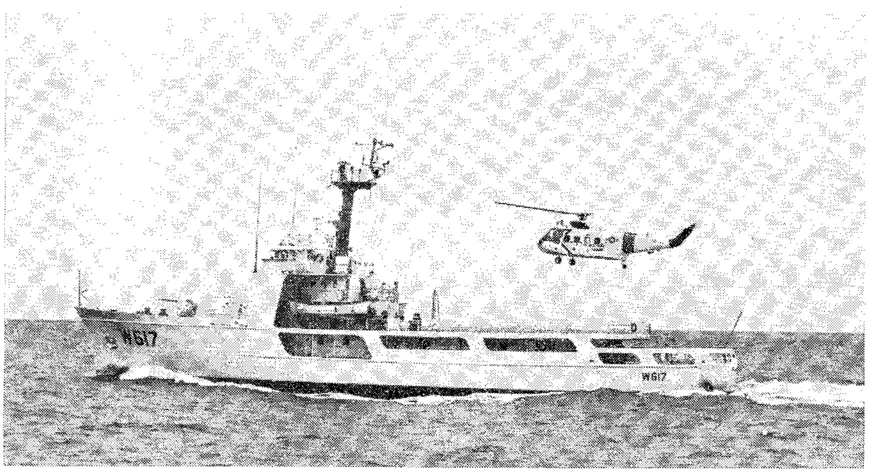


The Grumman J2F Amphibian was used by the Coast Guard during World War II for patrol duties. This type of plane was landed by Lieutenant John Pritchard on a Greenland glacier to rescue downed Army fliers.



One of the Coast Guard's most widely used aircraft is the Grumman Albatross. The 70-odd Amphibians now in service are essential to the Coast Guard's patrol and reconnaissance work.



The new 210-foot cutter Reliance *with amphibious–turbo helicopter coming in for a landing*

The first two Coast Guard graduates at Pensacola were Second Lieutenant Charles E. Sugden and Third Lieutenant Elmer F. Stone. Second Lieutenant Hall, because of his professional training as a naval architect, was ordered to the Curtiss Aeroplane and Motor Company's factory at Hammondsport, N.Y., to study aircraft engineering and construction.

The year 1916, although important for Coast Guard aviation, was an ominous one for the country and for the world. On the continent of Europe, the German and Allied armies were locked in combat on the bloody battlefield of Verdun. The first Coast Guard aviators received their wings in time to serve with the American forces in Europe. One, Lieutenant Sugden, served as Commanding Officer of the Naval Air Station, Ile Tudy, France. He was awarded the Legion of Honor by the French Government.

The years immediately following World War I were lean ones for Coast Guard aviation. One major event stands out, the race to win the "Atlantic Blue Ribbon." The war had spurred the development of aviation, and the idea of an aerial crossing of the Atlantic did not seem as improbable as before.

An intense rivalry had developed between the United States and England to make the first transatlantic crossing by air. Early in 1919, Lloyds of London was quoting 4 to 1 odds against any crossing in April, and 2 to 1 against any in May.

On May 17th, Americans reading their morning papers were electrified by headlines that three U.S. Navy flying-boats, the NC–1, NC–3, and NC–4, were winging their way across the Atlantic. Of the three, only the NC–4 completed the journey—the first aircraft to fly the Atlantic. The copilot was Lieutenant Elmer F. Stone of the U.S. Coast Guard. The United States had won the coveted "Blue Ribbon of the Air," and the Coast Guard had helped to win it.

The "Rum War" of the mid-1920's again brought Coast Guard aviation into the headlines—the turbulent prohibition era when rumrunners with their swift, powerful boats challenged the authority of the Federal Government. Coast Guard surface craft were no match for the smuggler's fast boats. It soon became apparent that aircraft would have to be brought into the effort. Again Congress came to the rescue by providing $152,000 for the purchase of five aircraft. Suddenly, Coast Guard aviation found itself with three new Loening OL–5 amphibians, and two Chance Vought UO–4s, flying from bases at Cape May, N.J., and Ten Pound Island, near

Gloucester, Mass. They were the first aircraft that the Coast Guard could call its own, all previous equipment having been borrowed from the U.S. Navy.

By 1940, the uphill fight for recognition had at last been won. The Coast Guard had a total of 50 aircraft operating from 28 stations in the continental United States, Alaska, and Hawaii.

Before the United States officially entered World War II, Coast Guard aircraft were operating as part of the U.S. Neutrality Patrol. The mission was two-fold—to protect U.S. shipping lanes from U-boats, and strategic Greenland from invasion. In this North Atlantic region are found the world's worst flying conditions. Pilots had to contend with continuous gales, low visibility, and Greenland's mountainous terrain.

Once war was declared, Coast Guard aircraft were engaged in convoy coverage, antisubmarine warfare, and patrol and rescue activities. From Pearl Harbor to the end of World War II, Coast Guard aircraft delivered 61 bombing attacks on enemy submarines, located some 1,000 survivors of downed aircraft and torpedoed surface craft, and directly participated in the rescue of 65. Ensign H. C. White of Patrol Squadron 212 is credited with sinking U-boat U–166 in the Gulf of Mexico in August 1942.

One of the most daring, but little publicized, rescues of the war, was carried out by a 29-year-old Coast Guard aviator, Lieutenant John A. Pritchard, of Burbank, Calif. In late November 1942, the Coast Guard Cutter *Northland,* to which Pritchard was attached, received word that communications had been established with an Army Flying Fortress which had crashed on the Greenland icecap 2 weeks before. The Fortress's crew had been badly injured. The *Northland* was ordered to proceed at full speed to the assistance of the fliers, but many miles of icepack lay ahead and time was running out.

Lieutenant Pritchard suggested to his commanding officer, Commander Francis C. Pollard of New Bedford, Mass., that he could save many hours by making a wheels-up landing on the glacier using the pontoons for skis.

Because of the risk involved, Commander Pollard hesitated, but finally granted permission for the rescue attempt. Before making the attempt, it was necessary to strip the small Grumman amphibian of all equipment not absolutely vital to flight. This was done to increase the plane's load-carrying capacity for the rescue.

The *Northland's* crew lowered the light J2F, containing Pritchard and his radioman, Benjamin A. Bottoms of Salem, Mass., into an ice-free stretch of water. Skillfully lifting the plane into the arctic air, the Coast Guardsmen headed North. Once above the 2,000-foot glacier, the two airmen scanned mile after mile of white waste for the downed B–17. Finally, it was sighted. The nearest stretch of smooth ice for a landing was 4 miles away, but Pritchard had no other choice. After the amphibian had finally slid to a stop, Pritchard left his radioman to keep contact with the *Northland* and set out on foot.

He found the survivors in great pain, starved, and half frozen. After administering first aid, he led and half carried three survivors back to the amphibian. Because of the Grumman's load limitation he could only take the two more seriously injured airmen on the first trip. He left the other airman for a return trip.

The takeoff down the icy slope was as hazardous as the landing. Gunning the motor, the amphibian shot forward, bouncing along until it had finally attained enough air speed to become airborne. This was the first time that a flier had been able to land and take off from the Greenland icecap.

It was nightfall by the time the plane reached the *Northland.* Guided by a narrow searchlight beam, Pritchard landed on the black water. His shipmates cheered as he taxied alongside.

The next day, despite radio warnings of an approaching storm out of the north, Pritchard and Bottoms again took off.

Once again Pritchard landed the amphibian on the icecap, picked up the remaining survivor, and managed to clear the ice. En route to the *Northland* the tiny plane flew into a raging storm. Shipmates lined the rail straining to hear the hum of the returning plane—without success. The plane had apparently lost its way and crashed. For their heroism, both Coast Guardsmen received a posthumous award of the Distinguished Flying Cross.

The years since World War II have seen a steady growth of Coast Guard aviation. Today its preeminence in the field of search and rescue is unchallenged. The techniques used are the most advanced in the world and serve as a guide for other countries. The planes used are no longer the wood-and-wire crates of aviation's early days. In the amphibious turbine-powered helicopter, the Coast Guard has at last realized its long dream of a "flying surfboat."

It is in the use of the helicopter that the Coast Guard is making some of its greatest advances. The "whirlybird" with its capability of hovering over targets and its all-around versatility is ideally suited for search and rescue. This was dramatically illustrated in 1965 when Hurricane Betsy wrought havoc in the southeast United States. Flying around the clock Coast Guardsmen rescued hundreds of stranded men, women, and

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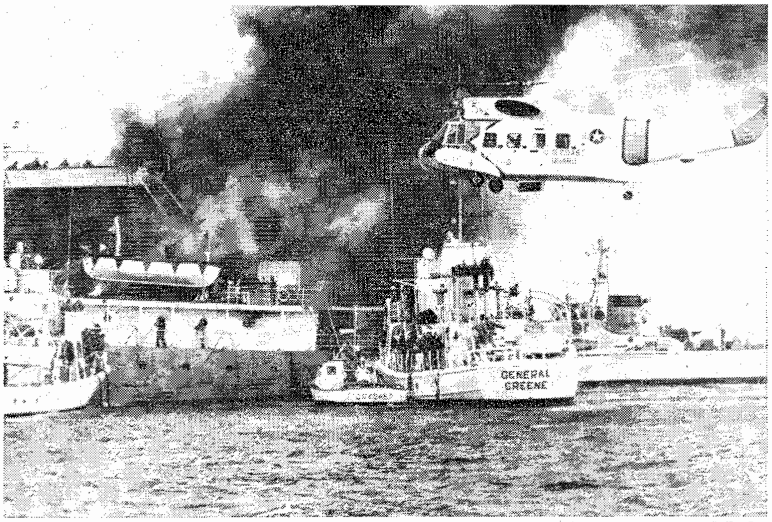


Courtesy New Bedford Standard Times and Ronald Rolo.

Coast Guard rescue team of cutters and helicopter in action following a fiery tanker collision.

Courtesy Cities Service Co.

Motives Behind Safety Work

Captain A. H. Stephens
California Shipping Co.

IN SOME CIRCLES there is a tendency to regard organized safety work carried out by corporations as sort of a welfare program, a part of the benefit package, something which the employer does to keep everyone happy.

Let us peer behind the veil and see what are the motives back of safety work; something which everyone in an administrative position should understand clearly. There are three mainsprings back of safety work: humanitarian, legal, and economic.

The appeal to humanitarian feeling is a powerful one. No supervisor wants to see his men getting hurt. No man wants to see a shipmate injured. When the full story of the pain and suffering that is a product of accidents is fully known, it becomes a strong argument for organized safety work.

The humanitarian motive brings better public relations and better employee relations. The value of these relationships may likewise be expressed in economic terms although its precise evaluation is difficult. It is well recognized that these relationships, if poor, can place innumerable difficulties in the path of any business.

The ordinary practice of seamen, in the language of the Rules of the Road, has established safe operating procedures of which observance is the price of survival. Many of these practices, with safety as a basic reason, have been formulated into laws and regulations. Hence, a second mainspring of safety work is legal. You strive to operate in a safe manner because there are laws requiring it.

Would that it were that simple. We have an abundance of regulations prohibiting accidents.

We come then to that third mainspring back of organized safety work: economic. Stated briefly, accidents cost money and organized safety work prevents accidents and this saves money.

Let us examine both parts of this

statement. What do accidents cost? The direct cost of accidents is represented by compensation payments, including legal fees, plus medical expenses. These can run to sizable sums.

While people are sensitive to discussing their own costs, I can say that in one representative American-flag fleet, the average annual direct cost of personal injury accidents was the equivalent of the cost of letting a T–2 sit at a dock idle for 37 days.

Expressed in another way, this cost would have paid the base wages of all hands on a T–2 for 6 months. Related to cost of operating, the average yearly injury cost is equivalent to the cost of operating a T–2 for over 2½ round trips in the U.S. Gulf/USNH trade.

What does the individual accident cost? This, of course, will vary widely. We believe that the run-of-the-mill lost time injury costs about $1.000. A man steps on a line and twists his ankle. He has a painful injury but nothing serious. He cannot, however, go to sea with the ship so he goes on industrial injury leave.

No discussion of costs would be realistic without reference to legal costs. Seamen are becoming increasingly sophisticated as to recovery by legal means, actively aided by a group of attorneys specializing in this field. In addition, the courts have become more and more liberal in interpreting the law in favor of seamen in injury cases.

Ships have been declared unseaworthy, thus removing the limit of liability, for a variety of reasons, many of which, to quote Professor Seward, "are puzzling to engineers, scientists, and experienced seamen." Not too long ago a ship was declared unseaworthy because some beans spilled out of a bag that had been unloaded from the vessel.

While the layman may have trouble following the legal thinking that reaches such conclusions, he will have no difficulty recognizing the awards, as they are often quite costly. The legal aspects of accidents provide sound economic reasons for accident prevention programs.

We have been talking about personal injury accidents. What about accidents in which no one is injured? Because of the high unit cost of marine equipment, these tend to be even more costly. For the same fleet mentioned earlier, the bill for marine hull and machinery and property damage came to $190,000 per year averaged out over a 5-year period. This loss is equivalent to tying up a T–2 for 64 days.

Occasionally, you will encounter an individual who will say, "Well, it's too bad about the accident but it's covered by insurance." The implication is that the insurance charges must be paid anyway and that therefore the accident doesn't really cost anyone any money, that is, except the insurance company.

Nothing can be further from the truth. In commercial insurance your premium is a direct reflection of your accident record for the preceding year. If you have a good record your premium will be less, if you have a bad record your premium will be more. Many insurance companies offer a client an organized safety program as a service. They want him to stay in business so that he can pay them premiums. These are the economic facts of life.

Many large companies are self-insured. Here, any savings coming from a reduction in accidents are clear profit.

The direct costs to industry of accidents run into billions of dollars a year. Now the important thing is that the direct costs are but a small part of the entire cost.

Research has shown that the indirect or hidden costs are four times as great as the direct costs of compensation and medical payments. This is a conservative figure; in some industries it is probably higher.

We do not contend that the 4-to-1 ratio holds true for every industrial injury, but it has been adequately tested to enable us to say that it provides an approximate proportion.

It can also be shown in extreme cases that the ratio of hidden costs can be extremely high. We had one case where this ratio was about 350 to 1.

Accident costs have been likened to icebergs where a small part of the berg is above the water and by far the larger part is below the water. The direct cost, medical and compensation, is that part above the water, whereas the part below the water is the hidden cost. Let us take a look at some of these hidden costs.

1. Cost of lost time of injured man over and above compensation.
2. Cost of time lost by other men who stop work:
    a. Out of curiosity.
    b. Out of sympathy.
    c. To assist injured man.
    d. For other reasons.
3. Cost of time lost by ship's officers, supervisors, or other executives as follows:
    a. Assisting injured man.
    b. Investigating the cause of the accident.
    c. Arranging for the injured man's work to be continued by some other person.
    d. Selecting, training, or breaking in a new man to replace the injured man.
    e. Preparing accident reports, or attending hearings before officials.
4. Cost due to injury to the machine, tools, or other property or to the spoilage of material such as a mixed cargo.
5. Incidental cost due to interference with production, failure to deliver cargoes on time, loss of bonuses, payment of forfeits, and other similar causes.
6. Cost to employer under employee welfare and benefit systems over and above legal compensation.
7. Cost to employer in continuing the wages of the injured man in full, after his return—even though the services of the man (who is not yet fully recovered) may for a time be worth only about half of their normal value.
8. Cost due to the loss of profit on the injured man's productivity, and on idle machines.
9. Cost of subsequent injuries that occur in consequence of the excitement or weakened morale due to the original accident.
10. Overhead cost—the expense of light, heat, rent, and other such items, which continues while work is disrupted.

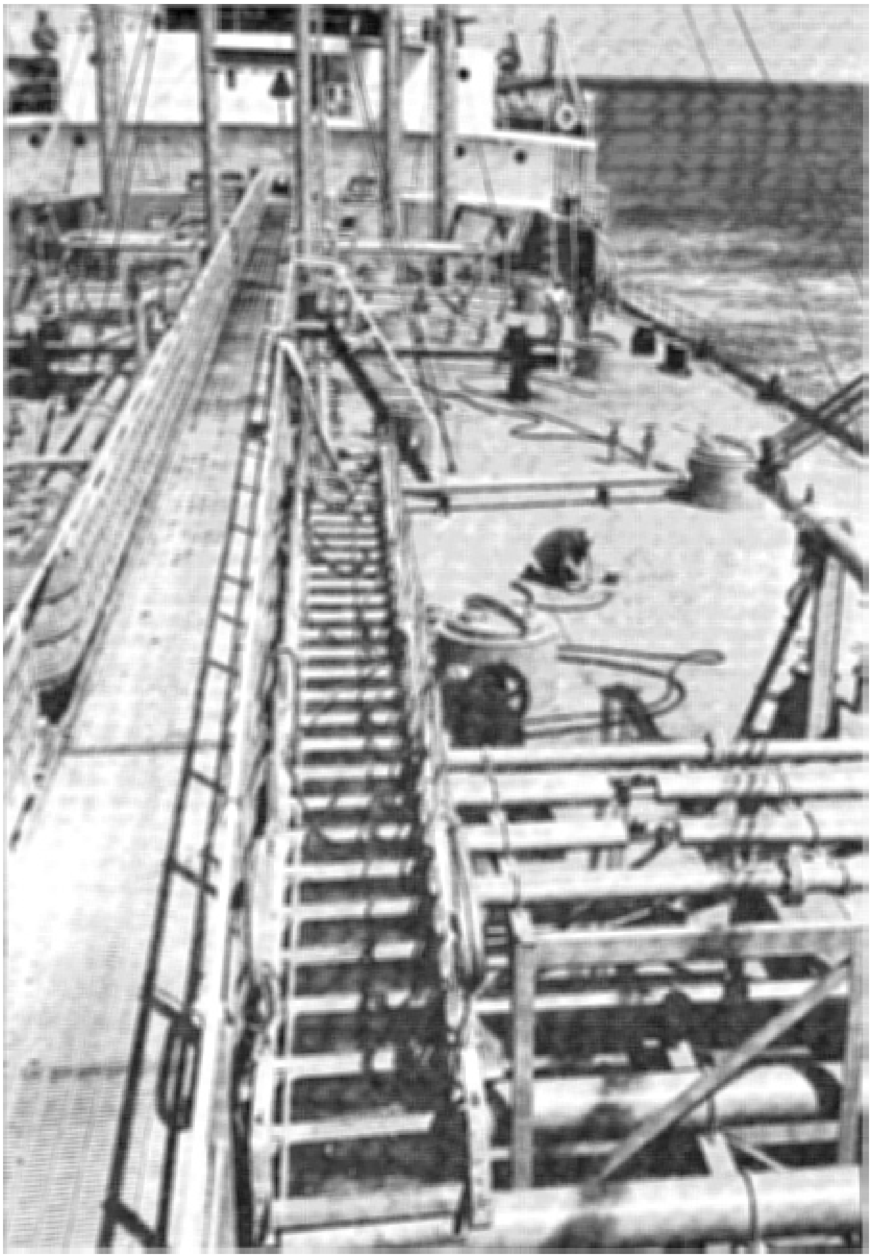
This list does not include all points that could be considered. One investigator has said that there are at least 100 other items of cost that appear one or more times with every accident.

The cost of accidents may well mean the difference between the success of a firm and its failure.

At this point, it seems timely to emphasize that organized safety programs work; that is, these programs reduce the number of accidents. Occasionally you will run into an old-timer, a skipper or chief engineer, who will say: "I don't remember any more accidents occurring in the old days and we didn't have to wet nurse the hired help."

Well, memory is not always reliable. I had occasion to review the industrial fatalities record of our organization running back almost 50 years. In the early years one or two fatalities a year seemed to be the average. A couple of years there were four or five deaths. Then the number of deaths started lessening and the picture was completely reversed.

Today it is almost unheard of to have an industrial fatality on one of our vessels. In the past 20 years, there has been only one industrial fatality on our vessels. This one was where a pumpman went down into



Courtesy Atlantic Marine News

the pumproom at sea without anyone's knowledge and took a valve out of a line. The line was full of gasoline and the man got gassed. When found, he was revived but later died.

Likewise, with lesser injuries, we can say that they have decreased over the years.

We ascribe this long-term favorable trend to the emphasis that has been put upon safe operations. The corporation has placed upon the subsidiaries the charge to establish and maintain such working conditions and practices that injury to employees and others and damage to company property and that of others, will not occur.

This responsibility is placed directly upon our management, on the ships' Masters and Chief Engineers and upon our licensed officers. To assist these individuals to discharge their responsibility, we have an organized safety program.

Our program is basically a long-range, low-pressure, educational one.

It is built around safety committees on ship and ashore. These committees meet monthly to consider problems connected with accident prevention and report directly to the management through their minutes.

In our opinion, these committees are very important. They provide a mechanism for the education of the junior officers and others and also a means of obtaining the opinions of the men who must personally solve the problems of operation and accident prevention.

The program revolves around communications. Not just communications from shore to ship but most importantly from ship to shore.

This program is serviced by two safety engineers. High on their list of duties is that of going to sea with the ships on short trips. During these trips a safety and sanitary inspection is made of the vessel. We are presently experimenting with an inspection checkoff list to aid in the inspections and to form a record of practices and conditions that may require correction. Our goal is to see that each company vessel has a safety engineer aboard for a voyage at least once a year.

An important part of our communications with the ships is our marine Safety Bulletin. It is published monthly and is a most useful means of promoting safety. It contains material calculated to contribute to the morale of the men, points out lessons to be learned from the experience of other tanker seamen, provides the Ship Safety Committees with topics for discussion (an essential point toward maintaining interest) and it emphasizes safe procedures learned in years of operating tank vessels—particularly as these procedures are set forth in our operating regulations.

An important part of our accident prevention program is the report required on every accident which involves lost time or requires a visit to the doctor. This report must be filled out by the officer in charge of the person injured. The report supplies essential data, indicates how similar accidents may be avoided and impresses the officer with his responsibility for prevention of accidents.

In our handling of injured personnel, we emphasize first, sympathy and care of the man, second, development of facts about the accident which will aid us in preventing similar accidents and develoment of facts which will protect the company's interests.

Within our organized safety program we have subprograms. One such is the program for providing seagoing personnel with prescription-ground safety glasses where a man wears such glasses at work. The individual is required to furnish the prescription at his own expense and the company pays the entire cost of

(Continued on page 185)

The Weak Link

Lt. Donald S. Krug, USCG

THE BIENNIAL inspection of an 18,610-ton tank vessel was progressing on schedule and No. 3 lifeboat was being prepared for the weight test required by the U.S. Coast Guard. The vessel's crew had followed a strict maintenance procedure, inspecting and lubricating the lifeboat falls frequently, therefore no trouble was anticipated. As a matter of fact, all four of the vessel's lifeboat falls were renewed about 2 years ago.

The boat was lowered to about 15 feet from the water and loaded with the correct amount of deadweight material. Suddenly, the forward wire rope fall "let go" suspending the boat momentarily by the after boat fall which also parted dropping the boat into the water in a capsized position. Fortunately no injuries to personnel were sustained and there was no apparent damage to the boat.

What happened? Had the falls parted at a portion of the rope weakened by corrosion, perhaps in an area "hidden" by the sheaves on the davit arms? Experience shows that these areas are often corroded due to being neglected when the falls are lubricated with the boat rigged in a stowed position. The wire behind the cheek plates of the sheaves cannot be reached with a brush or swab unless the boats are lowered, thus exposing the portions of wire on the sheaves. Investigation showed however that such was not the case on this vessel.

Further examination revealed that the bitter end of the falls had "pulled loose" from the "fiege" type wire rope sockets attached to the davits. Upon disassembly of the sockets attached to No. 1 lifeboat falls, it was found that the bitter end of the wire rope was not assembled correctly to the "socket," in that the wire strand ends were not extended beyond the tapered "plug" and were not visible in the inspection hole of the completed assembly (figs. Nos. 1 and 2). This condition was found to exist on all lifeboat falls, thus creating a potential danger to all members of the crew.

An examination of the vessel's work log reveals that all of the vessel's lifeboat falls were renewed approximately 2 years prior to the casualty. It is apparent, therefore, that the cause of this casualty was the incorrect assembly of the wire rope to the "fiege" type socket when the wire rope was renewed.

A chain (or wire rope) is only as strong as its weakest link!

In this case, where does the weakest link lie? In the wire rope socket? Possibly. But the chances are the weakest link here, we believe, is more than likely the human element. The cause of this casualty can probably be traced to inadequate training and experience as well as improper supervision.

A "Fiege" type socket is a compact assembly of three simple units:

(a) A "sleeve" which slips over the end of the wire rope.

(b) A "plug" which is inserted to separate and hold the strands of the wire in the sleeve.

(c) A covering "socket."

This combination, if assembled correctly, locks the wire rope to make a strong flexible connection that will develop 100 percent of the strength of the rope. (Figures No. 3 & 4.) Note the qualifying phrase "if assembled correctly." In this case the wire rope in four sets of lifeboat falls was as-

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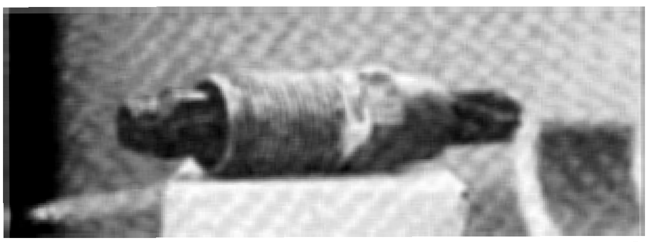


Figure 1. This "sleeve" with the fluted "plug" and portion of wire rope still intact was removed from the "fiege" type socket installed on one of the four lifeboat falls. Note that the strand ends of the cable are not even visible on the plug end of the assembly. It appears that the only thing holding the wire rope to the fitting is friction—as the "plug" wedges the strand ends against the inside wall of the "sleeve."

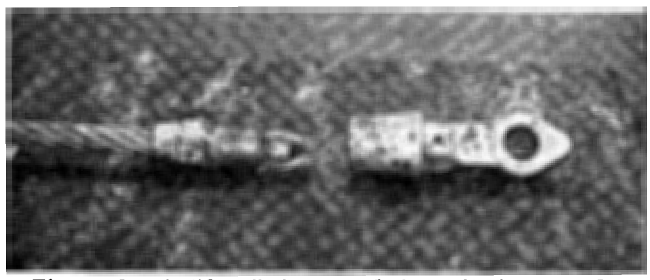


Figure 3. A "fiege" type socket partially assembled in the correct manner except that one of the strands is cut away to show the fluted "plug." Notice that the wire strand ends are grouped together beyond the head of the tapered "plug." When the covering "socket" is installed the wire rope will be "locked" to the socket assembly.

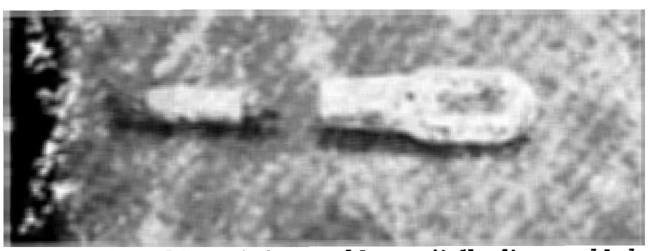


Figure 2. This socket assembly, partially disassembled, shows the wire strand ends just visible in the grooves of the "plug." Note the inspection hole in the covering "socket."

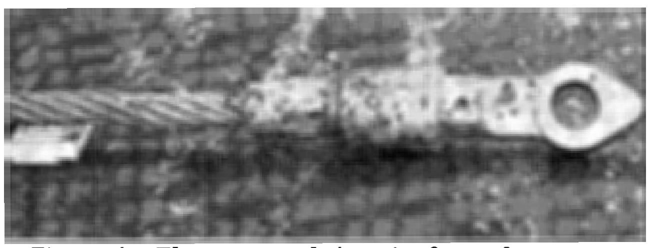


Figure 4. The same socket as in figure 3, now completely assembled. The wire strand ends are visible in the inspection hole, thus indicating that the socket is assembled in the correct manner.

227-344—66——2

MARITIME SIDELIGHTS

JAPAN BEAR AWARDED GALLANT SHIP HONORS

The coveted "Gallant Ship Award" has been presented to the *Japan Bear.*

The award was accepted by the ship's master, Captain Kenneth A. Shannon. In addition to the "Gallant Ship" Designation Captain Shannon accepted on behalf of the five members of the lifeboat crew Merchant Marine Meritorious Service Medals, and a letter of Commendation for the Radio Officer.

Japan Bear owned by Pacific Far East Lines, of San Francisco became the 18th ship to be designated a "Gallant Ship," for her rescue of 9 survivors from the sinking Chinese Nationalist ship *Grand.*

During the early morning of January 13, 1965, while en route from San Francisco, Calif., to Yokohama, Japan, the *Japan Bear* received a distress call from the *Grand* and immediately altered course and raced to intercept the distressed vessel.

Late that afternoon, in heavy seas, rendezvous was made with the stricken ship. The vessel had broken in two. Only the stern section remained afloat, and that was settling rapidly. *Grand's* remaining lifeboats were damaged and the survivors were huddled on deck.

Captain Shannon, relief master of *Japan Bear,* immediately assumed on-scene-command and ordered other arriving vessels to strategic positions about the stricken ship. A lifeboat was launched in an attempt to remove the survivors, but the wind and waves made this impossible, and it was only with a supreme effort that the lifeboat and its crew were recovered.

In a display of skillful seamanship, an unmanned lifeboat was towed to a position where it would drift alongside the wreck. Ten survivors jumped into the boat; however, one missed and was not seen again. When the lifeboat floated clear of the wreck, *Japan Bear* maneuvered alongside and hauled the survivors safely on board.

The citation for *Japan Bear* concludes: "The courage, resourcefulness, expert seamanship and teamwork of her master, officers, and crew in successfully effecting the rescue of survivors from a sinking ship have caused the name of the *Japan Bear* to be perpetuated as a Gallant Ship."

The Gallant Ship awards were authorized by the 84th Congress under Public Law 759, introduced by Senator Warren Magnuson of Washington. The awards may be made to any vessel which participates in outstanding or gallant action in maritime disasters or other emergencies for the purpose of saving life or property. The concurrence of the Secretary of Commerce and Secretary of the Treasury is required for an award to be made on the basis of a recommendation by the Maritime Administrator.

Japan Bear joins a select company of 18 ships. Nine ships have been cited for actions in which they participated during World War II, three for their part in the *Andrea Doria* rescue, one for a mass rescue of 14,000 civilians during the Korean conflict, one for a rescue off Alaska in 1959, one for the rescue of all 47 crewmen of a sinking Japanese ship on the edge of a typhoon, one for the rescue of 9 survivors of a Chinese ship off Formosa in 1963, and one for the rescue of 18 survivors of a Liberian ship off the Japanese coast in 1964.

The "Gallant Ship" award itself is a bronze medallion designed by artist Jo Davidson. It depicts a ship steaming full speed ahead. Below the ship is a bronze plate relating the action for which the presentation was made. All 60 members of the crew will receive Gallant Ship Unit Citation bars for their part in the rescue. ⚓

The master of the Pacific Far East cargo liner, S.S. Japan Bear, *receiving the Ship Safety Achievement Award for an outstanding rescue feat in the stormy Pacific seas. The award was presented to Captain Kenneth A. Shannon (left), Master of the ship, by Rear Admiral C. C. Knapp (right) U.S. Coast Guard, then Commander, 12th Coast Guard District, at San Francisco.*

VADM P. E. TRIMBLE

On July 13, 1966, President Johnson named Rear Admiral Trimble to the post of Assistant Commandant of the U.S. Coast Guard, which carries with it the rank of Vice Admiral (succeeding retiring Vice Admiral William D. Shields). He was sworn into office on July 27, 1966, by Assistant Secretary of the Treasury, the Honorable True Davis.

His military career began with his appointment as cadet to the U.S. Coast Guard Academy at New London, Connecticut, on August 13, 1932. He was graduated and commissioned on June 8, 1936.

After the Academy he served in various assignments for 6 years, under the Commander, First Coast Guard District, Boston, Mass. These respectively included duties aboard the Cutters, *Mojave, Algonquin, Chelan, Tahoe,* and *Cayuga* until August 1940. He was then selected for a postgraduate training course at the Harvard School of Business Administration where he graduated with a master's degree (MBA) with distinction in June 1942.

During World War II he commanded the patrol frigates U.S.S. *Hoquiam* (PF–5) and the S.S. *Sausalito* (PF–4) in the Pacific theater. Later he commanded the Coast Guard Cutter *Storis* (WAG–38), a multi-function (search and rescue, logistics, law enforcement, buoy tending, icebreaking) vessel then stationed at Juneau, Alaska, and the 327-foot Coast Guard Cutter *Duane,* an Ocean Station vessel out of Boston, Mass.

By nomination of the President (in January 1964) and confirmation of the Senate (February 10, 1964), the then Captain Trimble was appointed permanent Rear Admiral to rank as such from July 1, 1964.

Vice Admiral Trimble's World War II campaign and service medals and ribbons include the American Defense Service Medal, American Area, European-African-Middle Eastern Area, Asiatic-Pacific Area and the World War II Victory. ⚓

CAPT R. Y. EDWARDS

Captain Roderick Y. Edwards has been assigned to Headquarters as Deputy Chief, Office of Merchant Marine Safety.

Captain Edwards a former merchant marine officer served at sea from 1928 to 1941 in all grades including master. He joined the Bureau of Marine Inspection and Navigation as an inspector of hulls in 1941. Commissioned as a lieutenant commander in the Coast Guard in 1943, he went overseas as Officer in Charge, Bristol Channel and Southampton, England, in the first of many assignments which have given him direct experience in merchant marine safety work. While in Europe, he aided in the establishment of the Coast Guard Rescue Flotilla which participated in the Normandy invasion, and after organizing the port of Antwerp, Belgium, served at that post as executive officer to the Navy's "Com Belgium" for which Adm. R. Stark, USN, awarded him the Navy Commendation Ribbon.

After a brief tour in the New York Merchant Marine Hearing Unit, Captain Edwards was assigned to Coast Guard Headquarters in the Program Planning Division where he remained from 1945 until he was transferred as Officer in Charge, Marine Inspection, and Captain of the Port, in Philadelphia, in 1949.

Early in 1957, he was assigned as Assistant Chief, Merchant Vessel Inspection Division, Coast Guard Headquarters, where he served until his promotion to Chief, Merchant Vessel Personnel.

In July 1963, he was assigned as Chief of Merchant Marine Safety Division for the Twelfth Coast Guard District until he was recalled to Headquarters for his present assignment. ⚓

CAPT A. J. GROGARD

Captain Andrew J. Grogard assumes the duties of Chief, Merchant Vessel Personnel, and member of the Merchant Marine Council.

A former merchant marine officer, Captain Grogard started to sea in 1932 and obtained his master's license during 1944, and served as master from 1944 to 1949.

Captain Grogard was commissioned in the Coast Guard in 1949, and served on the Coast Guard Cutters *Ingham* and *Klamath* and in marine inspection assignments at St. Louis, New York, Yokohama, Japan, and Seattle.

During September 1965, he was assigned as Assistant Chief, Merchant Vessel Personnel Division, Coast Guard Headquarters, where he served until his present position. ⚓

PROFESSOR SEWARD TANKER HAZARDS CHAIRMAN DIES

Herbert Lee Seward, professor emeritus of mechanical and marine engineering at Yale University, died on July 14, 1966.

Professor Seward served on the Yale faculty for 42 years. He retired in 1950. He was also for many years, during his career and after his retirement, an adviser to governmental agencies. In World War II he served the Secretary of the Navy as consultant.

He graduated from Yale in 1906, became a lieutenant commander in the Navy during World War I, and was appointed a full professor at his alma mater in 1928.

Professor Seward was often involved in inquiries of marine disasters. He took part in the investigations following the burning and sinking of the French liner *Normandie* in the Hudson River in 1942, the collision of the *Andrea Doria* and the *Stockholm* in 1956 and the burning of the *Yarmouth Castle* last year. He also participated in the trial runs of many famous ships, including the *Leviathan*, the *Conte de Savoia* and the *America*.

For many years, Professor Seward was chairman of the advisory board of the U.S. Coast Guard Academy at New London. He directed the school's curriculum toward the present extensive 4-year course.

In 1962, Professor Seward headed the Secretary of the Treasury's Committee on Tanker Hazards, and was chairman of the committee that made an intensive study of ship construction subsidies for the Federal Maritime Board.

Professor Seward was a fellow of the American Society of Mechanical Engineers and an honorary vice president of the Society of Naval Architects and Marine Engineers.

MOORE-McCORMACK SAFETY SCHOOL

While classrooms were closing for the summer all over the country, Moore-McCormack Lines was opening a new school, perhaps the first of its kind along the waterfront.

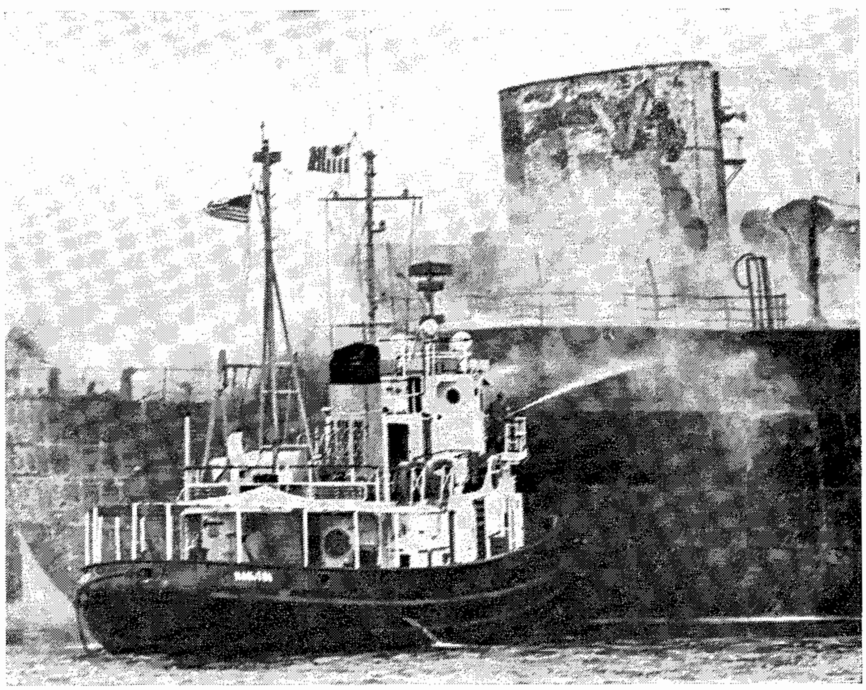
Since early in June, every time a Mooremack ship touches home port, men of the sea file into a classroom at the lines' 23d Street Terminal in Brooklyn to begin lessons in a subject of personal importance to all of them: safety.

The safety lectures are part of an intensified program developed by Capt. Harold R. Rosengren, safety director of the line.

The lectures were begun because ships are not industrial plants and safety conditions aboard them are always changing. Prior to the new program, each of the department heads met with the seamen on board ship. Now each man attending the lectures has the benefit of movies, slides, displays, and soon a skeleton-type model of the human body showing the best methods of lifting and moving.

While the lectures are now geared for unlicensed personnel, a series aimed at the officers is planned in order that they will be even more prepared to do "a little missionary work in safety."

The expanded emphasis on safety, it is hoped, will serve to reduce the accident frequency rate, the severity of injury, and minimize pain, suffering and the cost. Also being prepared for the program is a brochure of the lines' safety regulations to be distributed to each of the new crewmembers joining Mooremack ships.



Coast Guard tugs with New York City police and fire department units, battle flames aboard the 546-foot British tanker M.V. Alva Cape, *after the vessel collided with the 604-foot American tanker S.S.* Texaco Massachusetts *in the Kill Van Kull between Bayonne, N.J., and Staten Island, N.Y., on June 16, 1966. The* Alva Cape *was carrying a cargo of naphtha and the* Texaco Massachusetts *was in ballast.*

TRAFFIC ROUTING IN THE DOVER STRAIT

The Inter-Governmental Maritime Consultative Organization (I.M.C.O.) has recently announced that a one-way system for shipping using the Strait of Dover is likely to be operational late in 1966. Under the proposed scheme traffic moving northwards will keep to the French side of the Strait, while southbound ships will keep to the British side; in other words, a keep-right policy will be implemented.

It is believed that the limiting factor in the time schedule for the introduction of the one-way system is the allocation by the French Government of sufficient finance to allow buoyage of the channel off the French coast. On the British side only a few additional buoys will be required, though the position of a number of existing buoys would have to be changed. It has been estimated by Trinity House that they could complete their part of the work in something like 6 months.

The yearly total of vessels passing through the Strait of Dover is of the order of 300,000, making it the busiest stretch of open water in the world.

(More on this subject is to be found in the July 1965 *Proceedings* in an article on sealanes by Admiral Roland.)

From *Journal of the Honourable Company of Master Mariners*

nautical queries

DECK

Q. What are meridional parts?

A. Meridional parts are the length of the arc of a meridian between the equator and a given parallel on a mercator chart, expressed in units of 1 minute of longitude at the equator.

Q. What is the equation of time?

A. The equation of time is the difference between mean time and apparent time, usually labeled + or — as it is to be applied to mean time to obtain apparent time.

Q. What is a meridian transit?

A. A meridian transit is the passage of a celestial body across a celestial meridian. Upper transit, the crossing of the upper branch of the celestial meridian, is understood unless lower transit, the crossing of the lower branch, is specified. Also called transit, Meridian Passage, Culmination.

Q. Describe what is meant by the point of tangency on a gnomonic chart.

A. The point of tangency is that point on the earth at which the plane of the gnomonic chart is assumed to be tangent.

Q. A vessel makes a speed of 15 knots. What would be her speed in statute miles per hour?

A. 15 nautical mi./hr.

$$\times \frac{6080 \text{ ft./nautical mile}}{5280 \text{ ft./statute mile}} = 17.3 \text{ statute mi./hr.}$$

Q. When starting a refrigeration unit, you would assure that the water side of the condenser unit:

(a) Was secured
(b) Was vented
(c) Was bypassed
(d) None of the above

A. (b) Was vented

Q. A class "B" bulkhead is so constructed that, if subject to the standard fire test, they will prevent passage of flame for 60 minutes.

(a) True
(b) False

A. (b) False

Q. Which of the following is within the explosive range of most gasoline vapor-air mixture by volume:

(a) 0.1% to 1%
(b) 1% to 6%
(c) 6% to 25%
(d) 0.1% to 100%

A. (b) 1% to 6%

ENGINE

Q. Explain the advantage gained by multiple staging in turbines.

A. All other things being equal, the efficiency of any turbine depends on the blade speed-steam speed ratio. Multiple staging permits a relatively low pressure drop in each set of nozzles and therefore a relatively low steam entrance velocity for each stage. With a sufficient number of pressure stages the ideal blade velocity can be obtained for best efficiency, and the stresses will be well within the strength limitations of the practical blade. In marine practice it is not usually desirable to add sufficient stages in one casing to attain a workable blade speed as this would make the turbine unduly long. Instead, two or more turbines are used. Multiple-stage turbines can be built of much smaller diameter and size than required of impulse turbines for the same power.

Q. Explain the elementary thermodynamic principle of the steam turbine.

A. A steam turbine may be considered as a form of heat engine in which the thermal (heat) energy of the steam is converted into kinetic energy (energy of motion) by the expansion of the steam from a high-pressure to a low-pressure region as it passes through a restricted channel or nozzle. The decrease in thermal energy is equivalent to its gain in kinetic energy, which is directly proportional to the square of the steam velocity as it leaves the nozzle. The kinetic energy of the steam is then imparted to the moving blades as the steam passes through the turbine.

Q. Why is it important to maintain a high vacuum when running a turbine unit astern?

A. When running astern it is very important to maintain high vacuum as the heating due to astern rotation of the ahead blading is nearly proportional to the density of the atmosphere in which it rotates. Therefore if the vacuum is below normal the astern operating speed should be reduced in accordance with good judgment and special care should be taken to note at once any evidence of distress in either turbine unit.

SAFETY WORK

(*Continued from page 180*)

the glasses. They then become the man's private property. Shoreside employees who have occasion to visit or travel on the ships are also extended this benefit.

The program serves two purposes. Primarily, it affords eye protection. Secondly, it is a symbol, always before the man's eyes, of the company's interest in protecting his well-being. Since safety is largely a frame of mind, this is important.

To assist in producing this frame of mind, we have found the publication of the National Safety Council, "Family Safety," a most useful tool. This is a magazine devoted, as the title implies, to family safety. We send this magazine to the homes of all of our men who have been with us a year or more.

Another subprogram is that of providing the men with safety shoes at manufacturer's cost.

The trend in shipbuilding is toward even larger vessels, operated with increasingly fewer men. This presents new safety problems. New automated vessels will require men to sail them who can deliver consistent high-quality performance. These men will require special training. Can we meet these new safety problems and deal with the old ones at the same time? The answer is a resounding "yes." ⚓

WEAK LINK

(*Continued from page 181*)

sembled incorrectly to the "fiege" type sockets.

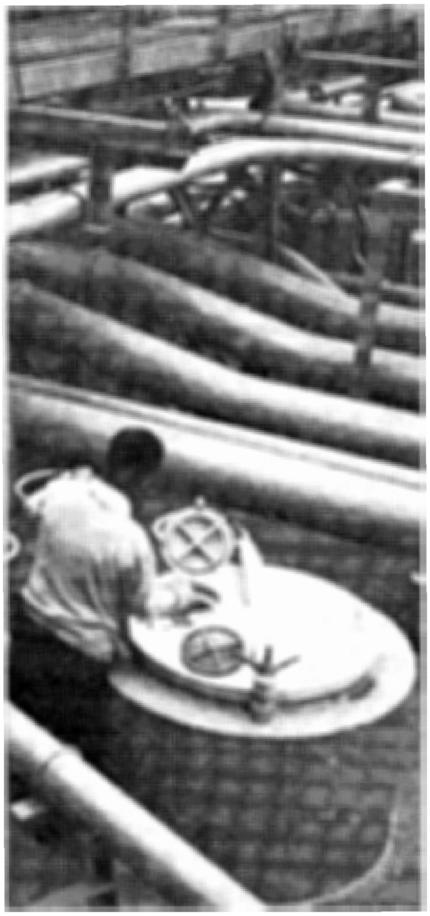
The lesson to be learned here is clear. When making repairs to machinery or renewing any piece of equipment it is important to review and follow the manufacturer's instructions. He has gone to great lengths to provide a reliable and trouble-free piece of machinery or equipment and he usually provides instructions outlining the best method of assembly and/or operation.

Secondly, it is important to provide proper supervision for the men doing the work. Not only will the supervisor be assured of getting the job done properly, but the men will do a better job knowing that their supervisor is taking an interest in them and their work.

What about the wire rope sockets on your vessel? Why not remove the paint obstructing the inspection hole on the socket and take a look inside. Are the wire strand ends visible? If not the socket is not assembled correctly. ⚓

A Question of Time

John L. Anderson



Courtesy Atlantic Marine News

Safety precautions tend to have universal application. Precautions necessary to the protection of life when cleaning land located inert gas tanks were set down a short while ago by a safety engineering officer of the U.S. Air Force in that service's Aerospace Maintenance Safety *magazine. In many regards his comments and recommendations reprinted below have marine utility as well.*

IS TIME THE only factor to be considered in the question of whether you can hold your breath in an atmosphere of inert gas, such as nitrogen?

While you ponder the answer to this question, let's assume a theoretical situation, just to impose a little urgency and complexity. This situation is not really so farfetched. It could happen to you.

You and your buddy (for the sake of a better name, we'll call him George) have been given the task of cleaning and decontaminating a welded seam inside a LOX storage tank. The tank has been nitrogen purged. Both of you have done similar jobs before, so you know exactly what to do. George will enter the manhole at the top of the tank, descend a ladder to the bottom, and accomplish the cleaning task. You will assist him and handle the lifeline.

George observes that the manhole is a little too small for him to squeeze through with his bulky air pack, so he evolves a simple plan and briefs you on it. He'll remove his air pack, take a deep breath and hold it, then descend the ladder through the manhole. You'll hand him his breathing apparatus, and he'll put his mask on. No sweat. The whole operation shouldn't take more than a minute or so, and anyone can hold his breath that long.

Once inside the tank, however, something goes wrong! While you're handing George his air pack, he either slips or falls from the ladder. Unconscious, he dangles some 10 or 15 feet below the manhole opening. You recall excitedly that lack of oxygen for 5 or 6 minutes can result in death. If George is to be saved, you must promptly retrieve him.

You call out an alarm to nearby workers, and begin hurriedly to hoist the lifeline. Help finally arrives, and together you pull George to the top of the tank. But, as you try to pull him through the manhole, you encounter trouble trying to aline his limp form with the narrow opening. After two more futile attempts, you begin to feel a little panic as you realize that at least 3 precious minutes have elapsed. Something must be done to get him through that manhole, and quickly! Out of desperation, a possible solution presents itself. If you fill your lungs with air, hold your breath, and descend the ladder, you can perhaps manipulate his body through that narrow opening.

Now, let's go back to our original question: "Can you hold your breath for a minute or so in a gaseous-nitrogen atmosphere?" Even though you could hold your breath underwater for three minutes when you were a kid, come from a long line of indestructible heroes, and carry a lucky rabbit's foot, please don't be too hasty in your answer to this question. Because if you can, and don't, then George's life is forfeited. Whereas, if you can't hold your breath, and attempt to do so, you will be needlessly committing suicide. So, before we undertake to answer this question, let's look at some of the variables that will influence the outcome:

First, how long can YOU hold your breath? Do you know precisely to the second, under all possible conditions of stress? The average person, under ideal conditions, could possibly hold his breath for a minute. But, when the elements of excitement and physical exertion are imposed, the length of time is decreased. So, if you are contemplating a rescue attempt, you'd better be absolutely certain of your capability.

Second, how long will it take to perform this particular task? If you have the time to "dry run" the problem, you can probably come up with a pretty close estimate. But you won't have the time, so a quick on-the-spot "guesstimate" will have to suffice. And, it had better be accurate, as we'll see in a minute.

Now, what happens if your estimate was slightly wrong, and the task requires even a single second longer than your breath-holding capacity? Or, if you involuntarily cough, choke, or gasp? You will inhale some nitrogen; and, as a result, the blood leaving the lungs will be loaded with nitrogen. Within 10 seconds, this oxygen deficient, nitrogen-laden blood will be passing through the brain. While the brain tissue represents only 2 percent of the body mass, it requires approximately 28 percent of the total oxygen intake. Since it is sensitive even to the slightest lack of oxygen, the nitrogen-laden blood will cause swift and certain unconsciousness. Should you gasp in a breath of nitrogen, your life will be strictly in the hands of your rescuers. And, if rescue is not effected within 5 or 6 minutes, you might as well forget it, because it really won't make much difference!

An example of how quickly an involuntary intake of nitrogen can affect a man is apparent in an accident that occurred some years ago. Both men involved were fully knowledgeable and well-equipped. Prearranged signals had been agreed upon, since the worker inside the tank would not always be in full view of the safety observer. Everything progressed normally until the safety observer's attention was distracted and he failed to observe and respond to a signal from the worker in the tank. Repeating the prearranged signal, and again failing to get a response, the worker in the tank decided to remove his air mask, and shout to get his buddy's attention. He did so, but in the process involuntarily inhaled some of the nitrogen. Fortunately, the safety observer's attention was no longer distracted. He noted that the tank worker was in trouble and withdrew him. Even so, in seconds he was unconscious. Fortunately, the prompt administration of oxygen revived the victim.

Because of the many variables involved, you just might be lucky enough to get by with a risky operation of this type. Maybe you even know of someone who has taken such a chance and lived to tell of it. But the law of probabilities is vastly opposed to your doing so, and the incidents in our official files should be sufficient to deter even the most foolhardy.

An effective accident prevention program for entering tanks and enclosed spaces requires a recognition that responsibility for safety, both at the time of entry and during the entire operation, rests with the SUPERVISOR. He must make sure that adequate steps have been taken to identify and eliminate or control the many hazards associated with the operation. Additionally, he must assure that all personnel understand the nature of hazards and the precautions to be taken. The hazards inherent in tank entry can be avoided or overcome if the following principles are applied each and every time a tank is entered:

Establish a definite system of preplanning for tank entry by physically isolating it, cleaning it to remove harmful contaminants, and testing it to insure absence of such contaminants.

Protective clothing and respiratory equipment should not be used as a substitute for cleanliness and ventilation.

Use a formal permit system, requiring written authorization for entry. Such authorization should be given only after the supervisor in charge is satisfied personally with tank preparation, precautions to be taken, personal protective equipment to be used, and specific procedures to be followed.

You've heard the expression, "The best laid plans of mice and men . . ." Well, it applies here, too. Just in case something goes wrong, you must be prepared to rescue the worker promptly. He should be equipped with respiratory equipment, body harness, and a lifeline. The size, shape, and location of the entryway must be considered in selecting the proper equipment. In some cases, it may be desirable to have a block and tackle positioned on a tripod, or otherwise fastened above the manhole. For obvious reasons, the manhole should be large enough to accommodate the man and his equipment. But, when the manhole is too small to accommodate the fully clothed and protected man, specific procedures must be developed in the preplanning phase and made a part of the tank entry permit. The outside safety observer must never be distracted from his "life guard" duties. He must never enter the tank until he is relieved of his post, and then only if he is properly equipped for tank entry and assured that outside assistance is adequate.

Proper supervision, careful preplanning, and preparation to cope with a mishap, should it occur, will go a long way in guaranteeing that you are never faced with the dilemma described at the beginning of this article. ⚓

WINGS

(*Continued from page 177*)

children from the rooftops of flooded buildings.

In one instance, a Coast Guard helicopter pilot, Lieutenant Roderick Martin of Glen Ridge, N.J., made a dangerous rooftop landing to rescue 14 blind persons. As he later described his experience: "The courage of this little group struck me because of the sharp contrast in the orderliness and patience as we lifted these blind individuals by basket into the helicopter. They were the easiest load that we picked up that entire day. It is difficult for me to place myself in their position, having been exposed to terrifying elements for about 24 hours, and then to have the thunderous noise of a helicopter descend on them for their rescue."

With the construction of the two most modern classes of cutters, the 210-foot *Reliance* class, and the 378-foot *Hamilton* class, both with helicopter landing pads, has developed one of the most successful operational units in the Coast Guard—the cutter-helicopter team. Now in both ice breaking and in patrol operations the helicopters serve as the "eyes" of the surface craft.

Another Coast Guard operation which has been radically changed by increased use of aircraft is the International Ice Patrol. Originally a surface surveillance of North Atlantic shipping lanes, the patrol is now carried out with long-range C-130 Hercules patrol planes operating out of Argentia, with cutters held in standby status.

In 1956, the Coast Guard's traditional responsibility for the safety of travel on and over the water was recognized in the National Search and Rescue Plan promulgated by the Department of Defense. In the plan the Coast Guard was assigned exclusive jurisdiction as Regional Search and Rescue Coordinator for the Maritime Region.

Altogether, it has been an eventful half century for the Coast Guard's air arm. But, as successful as it has been, experiments and tests are continually in progress to improve equipment and operations. The odds are that the next half century also will be filled with accomplishments. ⚓

False Sense of Security

The captains of two small inland vessels rudely learned that their sense of security was woefully false when they collided in fog while navigating heavily traversed waters. Both vessels were equipped with radar which was in operation and being used at the time of collision.

Although the visibility was becoming progressively limited, one of the vessels was proceeding without any apparent problems. The master was maintaining his speed and navigating from buoy to buoy by radar, relying as it were, upon his extremely limited radar experience. He had no difficulty hearing the gongs or bells on the buoys, and occasionally, he could visually sight them. Shortly after the last buoy was visually sighted, the visibility decreased to 100 feet. The master, however, did not reduce his speed or sound any fog signals because he did not detect any pips on the radar which appeared to be vessels. Then suddenly out of the fog loomed another vessel. He put his vessel full astern, but, too late.

The interrogation which followed the collision revealed that the master of the vessel had not, at any time, considered slowing down since the radar appeared to be working satisfactorily and since he had not identified any pips as vessels. He further stated that his experience with radar was limited to a couple of months, his only instruction coming from the person who had installed the radar. Last but not least, he testified that at no time did he record his position while underway. Why? Very simple, he had no adequate chart of the area!

The master of the other vessel was also navigating from buoy to buoy and he, too, was proceeding without incident. When the visibility decreased to 400 feet, the course was changed in order to visually sight a buoy and to more positively establish the vessel's position. This was the only buoy which this vessel visually sighted prior to the collision. After passing the buoy which was kept visually sighted over the stern, a target was observed on radar at an approximate range of 1 mile. The master did not, however, take any bearings of the target. The course was then changed slightly to enable the vessel to pass close aboard the next buoy. The radar was again checked, and the target was found to be about ½-mile distant. Although he did not take a bearing, the master "felt" that the target was not on collision course. At a distance of one-quarter of a mile, a fog signal was sounded as the target disappeared from the radar-scope. The captain, although not unduly concerned, continued to blow fog signals and attempted to relocate the target while proceeding without reducing speed. The target suddenly appeared out of the fog and evasive maneuvers were of no avail.

The investigation revealed that the second master's radar experience was also meager, and he had never received instruction in plotting targets on radar. Both of these inland masters now know that: SECURITY IS KNOWING HOW TO USE YOUR RADAR, SECURITY IS HAVING A CHART OF THE AREA, SECURITY IS RECORDING YOUR POSITIONS AND PLOTTING YOUR TARGETS, SECURITY IS REDUCING SPEED IN FOG, SECURITY IS SOUNDING FOG SIGNALS.

EDITORS NOTE: Although neither of the operators involved in the collision described above had been formally trained in the use of radar, the radar schools of the Maritime Administration were available to them. These schools are located at 45 Broadway, New York City; 180 New Montgomery St., San Francisco; and at 333 St. Charles St., New Orleans.

Falls

MR. A'S FALL

Mr. A's cargo vessel had docked to unload lubricating oil from the No. 4 'tween deck forward deep tanks.

During the afternoon Mr. A, a wiper, was assisting an engineer in the installation of a section of ballast line in the starboard tank. The tank cover was removed and placed on the 'tween deck; the port tank cover was in place, but the manhole was open. The dry cargo hatch beams and hatch boards were removed and stowed on the 'tween deck. The wiper and the engineer worked continuously, stopping only to rig lights and to allow the deck seamen to rig a hatch tent. About 2030, the pair took a coffee break.

At about 2055, the two men returned from the crew's messroom. The engineer had a small number of nuts and bolts wrapped in a rag which were to be used to blank off the ballast line. He arrived at the starboard side of No. 4 hatch, and pulled back the hatch tent in order that the wiper could descend to the 'tween deck. Upon reaching the 'tween deck, Mr. A received the nuts and bolts from the engineer. The engineer then turned his back to raise the edge of the hatch tent and began his descent. When he reached the 'tween deck, he noticed that it was not too well lighted, and he could not see his helper. The engineer called but received no answer. He then turned on his flashlight and directed it around the 'tween deck and finally made a search of the oil tanks which revealed nothing.

Upon shining his light into the cargo hatch, he saw Mr. A lying on the bottom of the hold. He was removed from the hold and taken to the hospital where he was pronounced dead on arrival.

This wiper could probably be alive today if better lighting had been provided or if he had used a flashlight to direct his own movements in a poorly lighted area.

MR. X'S FALL

Mr. X, aboard a vessel en route to take on grain, was directed by the chief mate on the day prior to the casualty to have the 'tween deck swept down before the ship reached port. At this time Mr. A, the boatswain, had gone over the 'tween deck and holds with the chief mate, and they noted that one hatch board was open on the after starboard section of the lower 'tween deck level as well as one in the after port section.

The next morning, the boatswain directed three seamen to sweep the 'tween deck area. The seamen arrived with their equipment in the early afternoon. However, before they commenced work, they heard someone fall. Upon checking, they found the boatswain dead on the bottom of No. 2 lower hold. After his removal from the hold, the chief mate investigated the area, looking for possible oil or water on which the boatswain might have slipped. The search proved negative, and, too, it was further determined that the area was adequately lighted. Mr. X had apparently been careless in his movements about the hatch opening—an area he had found only the day before to be unsafe due to the absence of two hatch boards.

Seeing the World From the End of a Towline

A T-2 tanker departed from a shipyard, took on a part cargo, and proceeded in a southerly direction. But not for long. The 8-12 oiler making his rounds, before relieving the 4-8 oiler, discovered that the casing of the main motor was so hot that you could not hold your hand on it for any length of time.

The turbine was slowed down but the motor started arcing and squealing at dead slow, so it was shut down.

The vessel was anchored about 5 miles offshore in a smooth sea with gentle westerly wind to await a tow back to port.

Meanwhile, back in the engineroom, the engineers were trying to find out what had happened and why.

The best guess is that the cooling system for the main propulsion motor stopped working for some reason such as loss of forced air circulation or inadequate flow of cooling water.

Briefly, in the motor casing, there is a heat exchanger that works like an automobile's radiator. Sea water is pumped through the heat exchanger—no water, no cooling. Fans circulate the air through the heat exchanger and thus cool the propulsion motor.

The ship had been on slow speed for about 3 hours because of boiler trouble. On slow speed the valve on the cooling water supply would be practically closed. The trouble on the boiler corrected, the engine was put back on full speed. We strongly suspect that the cooling water valve was not opened up to compensate for the change in speed.

After about an hour at full speed, things came to a screeching halt. The heat warped the rotor rim so that the rotor rubbed against the stator. This produced arcing and other signs that something was wrong.

Embedded in the stator (i.e., the stationary part of the propulsion motor) are a number of remote reading thermometers. To read these you must turn a selector switch on the face of the control board. These would have shown that the motor was heating up and the trouble could have been found before instead of afterward. One chief requires that these readings be taken every time an oiler makes a round.

The lesson here is a general one, that after maneuvering or making a speed change all equipment is to be watched carefully until the plant is settled down and all temperatures of all equipment are holding steady at their normal levels for the speed setting.

There is no substitute for alert watch standing.

From Safety Bulletin, California Shipping Co.

Take Ten!

(Ten things to know about ladders)

1. *TAKE* into consideration the slant of the deck.
2. *TAKE* into consideration the motion of the ship. Is she rolling? Is she pitching? Then lash the ladder down.
3. *TAKE* a glance at the safety angle of the ladder—does it rest against a mast, bulkhead, or any fixed part of the structure? The mathematical formula is 4×1: that is, the horizontal distance from the upright position should be one-quarter the length of the ladder.
4. *TAKE* a look at the ladder's shoes. See that they are not worn, uneven, loose, or greasy.
5. *TAKE* a look at your own shoes. Any oil or grease on the soles? If so, you could come down faster than you went up.
6. *TAKE* extra precautions if you attempt to lug tools aloft. Have them hoisted by line, bag, or bucket. Your hands will be occupied elsewhere.
7. *TAKE* one step at a time.
8. *TAKE* a bearing on the top rung—you can work up to two rungs lower, but if you go any higher, you are a candidate for reentry into the deck atmosphere—and in the hard way.
9. *TAKE* the right manner in ascending and descending a ladder—BY ALWAYS FACING IT.
10. *TAKE* an extra good look if your ladder is aluminum. Examine the rivets. They have been known to come adrift due to strain—and when they do—the ladder folds up like an accordion, and quite suddenly.

Courtesy Pacific Maritime Association

Oxygen Is Not Air

Air is a mixture of gases, mostly nitrogen and oxygen. The presence of oxygen in the air sustains human life. However, keep in mind that pure oxygen is a hazardous substance.

Air supports combustion because it contains about 20 percent oxygen. When the percentage of oxygen is increased, the rate of burning becomes more rapid; and when something burns in almost 100 percent oxygen (such as industrial oxygen), the rate of burning is extremely rapid—almost explosive.

The rapid combustion of flammable materials in oxygen has been the cause of numerous serious and fatal burns. One case involved a man working in an area where he was required to wear a supplied-air respirator. However, instead of connecting the respirator to a supply of air, he deliberately connected it to an oxygen line. While he was using the respirator, his shirt, the respirator, and the hose were ignited. He received burns of the hands, arms, face, and abdomen.

In another case, an aircraft carrier was in a shipyard for repairs. Two pipefitter helpers were cleaning the suction lines to the chain locker and lower deck of the bos'n's stores by disconnecting a manifold and blowing out the lines with air.

At the same time three laborers were cleaning out the sump below the chain locker grating. About 60 percent of the material in the sump consisted of drippings from a coal tar coating. Suddenly there was a "whoosh" followed by fire and smoke. It took several hours to bring the fire under control and to recover the badly burned bodies of the five men.

Investigation revealed that the airhose used for blowing out the suction lines had been connected to an oxygen line by mistake. The source of ignition was not known; however, the accident occurred in an area where smoking was permitted. This case emphasizes the need for clearly identifying the contents of pipelines, particularly where they carry hazardous materials.

Courtesy Safety Bulletin, Bethlehem Steel Corp.

AMENDMENTS TO REGULATIONS

TITLE 33 CHANGES

MISCELLANEOUS AMENDMENTS PUBLISHED

The regulations and actions considered at the March 21, 1966 Public Hearing and Annual Session of the Merchant Marine Council, have been published in the Federal Register of July 30, 1966. This document contains the actions taken with respect to the following:

Item I—Recreational boating. Ia. Uniform State Waterway Marker System; private aids to navigation.

Item IX—Rules of the road. IXa. Marina del Rey, Calif., line of demarcation between Inland waters and International waters.

IXb. Posting pilot rules on Great Lakes vessels.

IXe. Distinctive blue lights authorized for use by law enforcement vessels.

Commandant's actions. The proposals designated IXa, IXb, and IXe, in the above list, are approved as published in the Agenda (CG–249) and the regulations are set forth in this document. The proposals designated Ia, as revised, are approved and set forth in this document. The actions of the Merchant Marine Council with respect to comments received regarding these proposals are approved.

The proposals regarding the Uniform State Waterway Marker System (Item Ia) were revised to clarify application or intent as suggested in some of the comments received. Where appropriate, changes have been incorporated into the regulations. The significant revisions are as follows:

A. With respect to Coast Guard-State agreements, the text of 33 CFR 66.05–20 was revised to agree with current policies followed and to reflect several changes set forth in comments received. When a waterway is located within the area of jurisdiction of more than one Coast Guard District, the District Commander in whose district the State capital is located will execute the agreement on behalf of the Coast Guard.

B. With respect to the proposed requirement for uniformity of size, shape, material and construction of markers or for the numbers, letters or words on markers to be uniform within a State, it was not adopted and has been deleted (33 CFR 66.10–20(a) and 66.10–25(a)).

C. The use of reflector materials on buoys was changed to permit use of reflectors or retroreflective material (33 CFR 66.05–20(c)(4) and 66.10–30(a)).

D. Regarding mooring (anchor) buoys and the regulatory markers, the proposed minimum requirements of 3 inch bands were deleted (33 CFR 66.10–45(a) and 66.10–5 (b) and (d)).

NVIC 3–66 EXPLAINS TONNAGE MARK

For many years both U.S. and foreign admeasurement laws and regulations have provided that shelter deck spaces would not be exempted from measurement unless there were "tonnage openings" into these spaces.

The Safety of Life at Sea Conference, 1960 recognized that these openings were detrimental to safety and recommended a study of this question. As a result, the Maritime Safety Committee of the Intergovernmental Maritime Consultative Organization (IMCO) agreed upon recommendations eliminating a need for such openings as a condition for exemption of shelter deck spaces. These recommendations, which were promulgated by the Secretary-General of IMCO in May 1964, provide for the marking of "tonnage marks" on vessels' sides and for the assignment of dual gross and net tonnages. For purposes, other than safety, the lower gross and net tonnages apply when the marks are not immersed and the upper values apply when they are immersed. Under certain circumstances, provision is made for the use of tonnage marks when only one set of tonnages is assigned.

Public Law 89–219, approved 29 September 1965 and part 2 of the Customs Regulations (19 CFR Part 2), as printed in the Federal Register, 11 March 1966, are based upon these IMCO recommendations and provide for the use of tonnage marks and for assignment of dual tonnages in the manner prescribed in the IMCO document. The tonnage mark is placed abaft the load line mark and consists of a horizontal line surmounted by an inverted equilateral triangle. In some cases, this horizontal line may be supplemented by an additional horizontal line extending aft from a vertical line at the aft end of the tonnage mark. This additional line applies to the determination of tonnage when the vessel is in fresh water.

For purposes of application of the marine inspection laws, laws relative to manning, and the load line acts, where two gross tonnages are assigned, the upper value is always applicable.

Tonnage marks are not to be construed as additional load line marks. Whether or not they are submerged has no effect on the application of the aforesaid laws and related regulations administered by the Coast Guard.

NVIC 3–66, may be obtained from the local marine inspection office or by writing Commandant (CHS), U.S. Coast Guard, Washington, D.C. 20226.

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., 20226.

STORES AND SUPPLIES

Articles of ships' stores and supplies certificated from July 1 to July 31, 1966, 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

The Perolin Co., Inc., 350 Fifth Ave., New York, N.Y. 10001, Certificate No. 676, dated July 12, 1966, PERO-KLEAN ELECTRICAL CLEANER NO. 857; Certificate No. 678, dated July 20, 1966, PERO-KLEAN MARINE CLEANER NO. 842.

Murd Co., 37 N. Mascher St., Philadelphia Pa. 19106, Certificate No. 677, dated July 18, 1966, ZURD HOUSEHOLD INSECT SPRAY.

AFFIDAVITS

The following affidavits were accepted during the period from June 15, to July 15, 1966:

Ladish Co., Kentucky Div., P.O. Box 159, Cynthiana, Ky. 41031, VALVES, FITTINGS AND FLANGES.[1]

Coen Co., Inc., 1510 Rolling Rd., Burlingame, Calif. 94010, VALVES AND FITTINGS.[1]

Hack Valve Co., 1759 Mariposa Rd., Stockton, Calif. 95206, VALVES.[1]

[1] Change of address.

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, 1966 and Supplement dated July 1, 1966 are now available from the Superintendent of Documents, price basic book: $2.50; supplement: 60 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 (8–1–62).
115	Marine Engineering Regulations and Material Specifications (9–1–64). F.R. 2–13–65, 8–18–65, 9–8–65.
123	Rules and Regulations for Tank Vessels (5–2–66).
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.
172	Rules of the Road—Great Lakes (6–1–62). F.R. 8–31–62, 5–11–63, 5–23–63, 5–29–63, 10–2–63, 10–15–63, 4–30–64, 11–5–64, 5–8–65, 7–3–65, 12–22–65, 7–30–66.
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).
182	Specimen Examinations for Merchant Marine Engineer Licenses (7–1–63).
184	Rules of the Road—Western Rivers (6–1–62). F.R. 1–18–63, 5–23–63, 5–29–63, 9–25–63, 10–2–63, 10–15–63, 11–5–64, 5–8–65, 7–3–65, 12–8–65, 12–22–65, 2–5–66, 3–15–66, 7–30–66.
190	Equipment lists (8–3–64). F.R. 10–21–64, 10–27–64, 3–2–65, 3–26-65, 4–21–65, 5–26–65, 7–10–65, 8–4–65, 10–22–65, 10–27–65, 1–27–66, 2–2–66, 2–5–66, 2–10–66, 3–15–66, 3–24–66, 4–15–66.
191	Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel (2–1–65). F.R. 2–13–65, 8–21–65, 3–17–66.
200	Marine Investigation Regulations and Suspension and Revocation Proceedings (10–1–63). F.R. 11–5–64, 5–18–65.
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 (7–1–64). F.R. 6–3–65, 7–10–65, 10–9–65, 10–13–65, 3–22–66, 7–30–66.
249	Merchant Marine Council Public Hearing Agenda (Annually).
256	Rules and Regulations for Passenger Vessels (4–1–64). F.R. 6–5–64, 8–21–65, 9–8–65.
257	Rules and Regulations for Cargo and Miscellaneous Vessels (1–3–66). F.R. 4–16–66.
258	Rules and Regulations for Uninspected Vessels (1–2–64). F.R. 6–5–64, 6–6–64, 9–1–64, 5–12–65, 8–18–65, 9–8–65.
259	Electrical Engineering Regulations (7–1–64). F.R. 2–13–65, 9–8–65.
266	Rules and Regulations for Bulk Grain Cargoes (7–1–64). F.R. 3–10–66.
268	Rules and Regulations for Manning of Vessels (2–1–63). F.R. 2–13–65, 8–21–65.
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, 4–10–62, 4–24–63, 10–27–64.
323	Rules and Regulations for Small Passenger Vessels (Under 100 Gross Tons) (1–3–66).
329	Fire Fighting Manual for Tank Vessels (4–1–58).

CHANGES PUBLISHED DURING JULY 1966

The following have been modified by Federal Registers:
CG–169, CG–172, CG–184, and CG–239, Federal Register, July 30, 1966.

U.S. GOVERNMENT PRINTING OFFICE:1966