PROCEEDINGS OF THE
MERCHANT MARINE COUNCIL
UNITED STATES COAST GUARD

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This copy for not less than 20 readers.
PASS IT ALONG

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The Merchant Marine Council of the United States Coast Guard

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"The sailor is safer when the decks are dry; the decks are safer when the sailor is dry."

If just one reminder helps you avoid just one accident to just one worker it will have done its job well

"When painting over the side on a staging, don't step back to admire your work."

YOUR LANTERN—NOT YOU

A hush was over the courtroom. The prosecuting attorney was cross-examining the witness.

"Will you please tell the court your name and occupation?" asked the attorney.

"My name is John Smith, and I work as a crossing tender for the XYZ Railroad."

"Now, Mr. Smith, will you tell in your own words exactly what happened on the night of the fatal automobile crash on June 14, 1952."

"Well," began the witness, "it was about 10:30 at night. It was raining cats and dogs and you couldn't see very far off. The 10:32 freight train from New York was due and I had lowered the gate. Just as the train was approaching, I saw the headlights of a car in the distance, so I signalled it to stop."

"And how did you signal it to stop?" interrupted the prosecuting attorney.

"I waved my railroad lantern at it," replied the witness.

"And then what happened, Mr. Smith?"

"The car kept coming, and I kept waving my lantern," was the curt reply.

"How many times did you wave your lantern, Mr. Smith?" pressed the attorney.

"Oh, about 30 or 40; and then when I saw the automobile wasn't going to stop, I got out of the way and the automobile plowed right smack into the freight train."

This testimony won the case for the railroad, because the prosecuting attorney could not prove that the railroad company was negligent in taking the proper safeguards to prevent the accident.

After the trial, the company officials were commending the witness, John Smith, on the splendid way he gave his testimony.

"It was nothing," replied John, "but that lawyer sure had me scared. I thought for a minute he was going to ask me if the lantern was lit!"

And so it is with personal accidents. Some place along the sequence of an accident a safety precaution is neglected, and someone is injured. BE SURE YOUR LANTERN IS LIT!

COLOR AND SAFETY

MARINE SAFE PRACTICES PAMPHLET 76, WHICH IS REPRINTED BELOW THROUGH THE COURTESY OF THE ACCIDENT PREVENTION BUREAU, PROVIDES CONSIDERABLE FOOD FOR THOUGHT AND DISCUSSION.

Aboard ship color has long been used with distinctive meanings as in running lights, stack insignia and the overall paint jobs which are characteristic of many lines. More recently the attention drawing power of color has been applied in industry to accident prevention. Hazards must be seen to be avoided, and color makes them more easily seen. It is just the opposite of the principle of camouflage.

In July 1945, the American Standards Association published a color code for the "Marking of Physical Hazards and the Identification of Certain Equipment." This code used four colors: Red, Green, Yellow, and White. In 1953, this code was revised to include seven colors: Red, Green, Yellow, White, Blue, Orange, and Purple. In this system Red is used for identification of fire-fighting facilities. Green is used to indicate safety and first aid equipment. Yellow is used to mark hazards which would cause a man to stumble, trip, or strike against, or be struck by something. Blue is also used to symbolize caution. White is used to mark traffic lanes and house-keeping facilities. Orange is used to call attention to unsafe conditions. Purple is used to mark radiation hazards.

This color code has many applications aboard ship where it could be used to good advantage.

The following code with some suggested uses should be of value aboard ship.

1. RED Red is the basic color for identification of:

(*a*) Fire protection equipment and apparatus,

(*b*) Danger, and

(*c*) Stop.

Aboard ship Red is recommended for marking such things as:

(*a*) Fire protection equipment and apparatus.

(*1*) Fire exit signs.

(*2*) Red background area on bulkhead at location of fire extinguishers and fire hose racks or reels.

(*3*) Hose connections.

(*4*) Fire alarm stations.

(*5*) Fire main valves.

(*b*) Danger

(1) Safety cans or other portable equipment for flammable liquids.

(2) Danger signs.

(*c*) Stop

(1) Stop buttons for electrical switches used for emergency stopping of machinery.

2. ORANGE. Orange should be used as the basic color for designating dangerous parts of machines or energized equipment which may cut, crush, shock or otherwise injure a person. Orange is also used to emphasize such hazards when enclosure doors are opened or when gear, belt, or other guards around moving equipment are open or removed, exposing unguarded hazards.

Orange can be used aboard ship to mark such hazards as:

(*a*) Interior surface of switch box covers, fuse panels, and removable guards on machinery.

(*b*) Hand cranks and exposed shaft ends on lifeboat windlasses.

(*c*) Edges of gypsy heads to warn against holding lines too close to gypsy.

(*d*) Bottom of snatch block to warn against standing in bight.

(*e*) Hazardous moving parts of machinery.

3. YELLOW. Yellow is the basic color for designating caution and for marking such physical hazards as: striking against, stumbling, falling, tripping, and "caught between." Solid yellow, yellow and black stripes, yellow and black checkers (or yellow with a contrasting background) should be used interchangeably, using the combination which will create the best attention in the particular environment.

The following shipboard applications of yellow paint are suggested by accident reports:

(*a*) Gangway—bottom step and edge of platform.

(*b*) Deck load lashings where they cross walkways.

(*c*) Padeyes and other tripping and stumbling hazards on deck.

(*d*) Sills and overheads of doors.

(*e*) Bottom steps of ladders and edge of deck at heads of ladders.

(*f*) Control boxes, ventilators, and other projections into passageways.

(*g*) Cargo hooks.

(*h*) Edge of coaming in T/D.

(*i*) Edge of hawse pipe.

(*j*) Valve wheels and other projections through floor plates.

(*k*) Hand rails, guard rails.

(*l*) Caution signs.

(*m*) Inside edge of door jamb for foot or so about eye level to warn against resting hands and fingers in way of door.

4. GREEN. Green can be used to indicate the location of safety and first-aid devices. A green cross can be used to indicate the location of:

(*a*) First-aid supplies.

(*b*) Life rings.

(*c*) Hospital.

(*d*) Stretchers.

(*e*) Cabinets for respirators and gas masks (containers themselves may be green).

(*f*) Life boat stations.

(*g*) Safety bulletin boards.

5. BLUE. Blue is used to indicate the need for caution. The use of this color is limited to using it as a tag to place on equipment which should not be used, moved, or started while repairs are being made or for some other reason. For example, a tag on whistle valve while men are painting around or working on whistle, tag on steering wheel while working on steering engine, tag on engine controls while men are working around propeller, etc. Blue may also be used on deck to paint the outside of control boxes of electric davits, winches and windlasses to caution operators to be sure that all is clear before starting.

6. PURPLE. Purple is the basic color used to designate radiation hazards. (As used in this code, purple is used to indicate such radiation types as X-ray, alpha, beta, gamma, neutron, proton, deuteron and meson.) This color is used to mark storage areas disposal areas, containers, etc. At the present time this is not a shipboard problem.

7. WHITE. White (and black) or a combination of these two are the basic colors for traffic controls and housekeeping markings. Solid white, solid black, single color striping, alternate stripes of black and white or black, and white checkers should be used in accordance with local conditions.

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Courtesy Maritime Reporter

PREVENTION OF HEAT SICKNESS

At times the conditions under which men must work on board merchant vessels are unpleasant because of the extreme heat found in the engine-room, galley, holds, or on deck in hot weather. There is a greater problem presented by this heat which is more than just unpleasant, however. This, of course, is the physical effect on the body resulting from a person becoming overheated, known as heat sickness.

There are several classes or degrees of heat sickness found among workmen who are exposed to unusual heat conditions. *Heat cramps,* probably the most common type of heat sickness, consists of severe and painful contractions of the muscles of the legs, arms, and stomach. If just for this reason everything should be done to prevent it. However, heat cramps may lead to or be accompanied by *heat exhaustion* or *heat fatigue,* a condition wherein the person becomes dizzy, weak, and eventually is unable to stand. When the patient falls, he usually is not unconscious and may be rather easily aroused. The skin is usually cool and wet with profuse perspiration. The temperature is normal, or more commonly subnormal. The pulse is weak, sometimes almost imperceptible, and the respirations are shallow.

The most serious, and sometimes fatal, type of heat sickness is *heat stroke* or *sunstroke.* The same set of circumstances which causes heat cramps or heat exhaustion causes both heat stroke and sunstroke, with the exception that sunstroke results from too long an exposure to the hot sun, while heat stroke is the result of exposure to excessive heat indoors. The difference between the two terms therefore refers to the source of the heat which causes the illness. For this reason both will be referred to herein as heat stroke, inasmuch as the symptoms and treatments for each are identical.

It is extremely important, however, that *heat stroke* and *heat exhaustion* be distinguished from each other. The symptoms of each are different, and the treatments for each are different as will be seen later.

The symptoms of heat stroke are headache, dizziness, irritability, and seeing objects through a purplish haze. The temperature of the victim is high, and the skin dry, which is just the opposite from the conditions found where heat exhaustion is present. The temperature of the victim of heat stroke may rise to 110° or higher. If unconsciousness and high temperatures last any length of time, the danger is very great. In extreme cases, the victim collapses suddenly and dies within a few minutes.

Fortunately, these forms of heat sickness may be easily prevented on board ship by taking simple precautions to guard against them. We have heard over and over again that one must drink plenty of water and take salt in hot weather and while working in areas of extreme heat. This is the proper remedy for preventing heat sickness, but why is this so?

In order to answer this question it is necessary to understand some of the functions of how our body temperatures are regulated. We all know that the normal body temperature is 98.6°, and that this temperature is maintained unless something goes wrong, whereupon, the temperature rises or falls, and we are ill. Generally, however, the body maintains an even temperature by releasing heat by radiation, conduction, and convection from the skin, evaporation from the skin, vaporization from the lungs, and a certain amount by expired air. When the temperature of the air around us rises to a point near or above our body temperature, the evaporation process becomes all important. This is so because at these temperatures the body is no longer cooled by contact with the air, and relies on the evaporation process to maintain the proper temperature.

The evaporation process is the final step in the process of removing heat from the body by means of perspiration. Moisture is brought to the surface of the body as we perspire, and as it evaporates it cools the body inside and out.

Something else happens to the body besides being cooled in this process. That is, hot water and sodium chloride (common salt) are taken from the body. The amount of water removed depends upon how high the temperature and how much exercise we are doing. Proportionately as a larger amount of water is removed, so also is a larger amount of salt taken from the system. These losses must be replaced if the body is to function properly.

Under normal conditions we undoubtedly drink sufficient water and get enough salt in our diets to replace what is lost by perspiration. However, working on the simmering platforms of the engine spaces, over a hot galley stove, or on a blistering hot deck are not normal conditions. Under abnormal conditions such as these a considerable amount of water is used, and therefore if the body is to function properly it must be replaced. The same goes for salt, which if not replaced will cause heat sickness.

The replacement of water is of course a simple matter. Plenty of good cool water is always available on the ship, and should be consumed at frequent intervals. When a person has been doing hard work under extreme heat conditions it is not advisable to drink water containing ice. Such a practice may cause cramps or other illnesses where the person drinking it is overheated. Generally the amount of water required by the body is pretty well regulated by desire.

Maintaining the proper amount of salt in the body requires a little more doing. It is true that salt tablets are available on board, but one must remember to take them. Salt is not stored in the body in reserve, like fat, but is used if required, otherwise passed off through the kidneys. For this reason a continuous supply in the proper amounts should be maintained in the system. To make this easy to accomplish, salt tablet dispensers should be kept full and accessible at every drinking fountain. Inasmuch as there are various types of tablets on the market, the manufacturers instructions on the dispenser should be followed with regard to the amount taken. Generally, however, the amount taken will depend upon the heat and the type of work being done. Where the work is hard and the heat excessive a salt tablet and water should be taken at frequent intervals.

Some individuals shy away from

salt tablets, maintaining that they make them sick to their stomachs. As in all types of industrial medicine, research is constantly being conducted to improve existing products, such is the case of the salt tablet, which has been improved to eliminate as much as possible any unpleasant temporary after effects of taking them. They have also been designed to provide all the required salts to the system within a short time after taking.

There are of course other means of taking salt for those who do not desire to use the salt tablets. For example more salt can be used on the food we eat. This is not the most satisfactory method in that all persons do not use the same amount of salt on their food, some may get enough in this manner and others not enough. Another disadvantage of taking salt with meals only is that it is not always available when needed, that is during the working period. As was mentioned above, salt must be supplied continuously, since the salt level in the blood may be at a normal level early in the day, but unless additional amounts of salt are supplied, may drop to a low level before the day's work is done. For this reason it does not appear too practical to rely on getting a sufficient amount of salt solely from what we get with meals when the weather is hot or when doing hard work where heat is extreme.

Another means of getting sufficient salt in the system as needed is to put a small amount of salt in the drinking water. On board ship this would have to be done by the individual himself. If not made too strong and if used with cool water it will be palatable and refreshing, and will not increase the sensation of thirst. This method replaces the salt and water in the body at approximately the same rate the loss is experienced through perspiration, and the normal chemical balance of the body is maintained. The body is about 80 percent water, and salt is important in helping to keep the necessary amount of water in various parts of the body.

There is no question about the effectiveness of salt in preventing heat cramps and heat exhaustion. This has been proved not only by medical science, but also by actual experience, particularly during World War II when vessels were sealed up on long, hot voyages.

Heat sickness is no respector of age, and hits primarily those who work hard while exposed to great heat. Persons who are in poor health, unacclimated, or who have suffered from heat sickness in the past are more susceptible to heat sickness. As was

(*Continued on page 113*)

Your Fact Forum

Q. What precautions should be noted in stretching tarpaulins in battening hatches?

A. Aside from tucking in corners tightly, tarpaulins should be so stretched that the successive cloths of the tarpaulin are with the upper strips forward, in order to prevent expected winds and seas from forward from opening the seams or further tearing existing openings.

Q. How are grommets installed on canvas work?

A. A hole of the proper diameter is first cut in the canvas, using a cutting punch if available. The grommet is then inserted in the hole, or arranged with its washer on one side and the grommet on the other, and secured by using a grommet inserting die.

Q. Why is it important that lifeboat sail dimensions and mast and yard specifications be adhered to as closely as possible?

A. It is important that the pertinent regulations be adhered to in order to provide a minimum of sail power. If the dimensions are exceeded there is danger of capsizing from too great a heeling moment.

Q. When running before a heavy sea in a lifeboat with sail set, what precautions should be taken to keep the boat from breaching to?

A. The weights in the boat should be so distributed that the stern is deeper in the water than the bow. The sail should be set as far forward in the boat as possible. And, if necessary, a drag, such as a sea anchor, a bucket on a line, or a rope in the water should be used over the stern.

Q. What is the usual amount of chain used by vessels when anchoring? What factors are considered in determining this amount?

A. The usual amount is 5 to 7 times the depth of water. However, the specific amount depends on such factors as the length of the anticipated stay at anchor, the nature of the bottom, the present and anticipated weather, tidal and current conditions, the state of readiness of the ship's powerplant, the draft, and the amount of exposed hull and superstructure.

Q. What precautions must be observed by a vessel anchored in an exposed roadstead?

A. A vessel anchored in an exposed roadstead, in addition to the usual requirement of maintaining an efficient watch, should have a second anchor ready to let go, if necessary, and her machinery available for use on short notice.

Q. If heaving up the anchor in a heavy sea or swell with the vessel rolling or pitching, how might you avoid damage to the bow plating from the swinging anchor?

A. A practical method of avoiding such damage is to leave the anchor hanging under the forefoot until the ship can be put on such a heading that any swinging and buffeting of the anchor is minimized.

Q. To whom does a merchant mariner have the right to appeal from a decision suspending or revoking his license?

A. The Commandant, U. S. Coast Guard.

Q. What is the concentration of gas the gas mask will stand?

A. Approximately two percent.

Q. Where are storm warning signals displayed?

A. They are generally displayed at Coast Guard stations, lighthouses, and also on high public buildings. Storm warning displays by flag hoist are also made by Coast Guard lightships while on station during daylight hours.

Q. Describe the day and night northwest storm warning signals.

A. A white pennant above a square red flag with black center displayed by day, or a white lantern above a red lantern displayed by night, indicates the approach of a storm of marked violence with winds beginning from the northwest.

Q. What precaution should be taken with taut dry ropes, such as signal halyards, when wet with rain?

A. Untarred rope, manila in particular, will contract when wet. Taut dry ropes should be immediately slacked off when wet with rain. Signal halyards should be secured in such a fashion as to allow for contraction when doused by rain.

Q. In handling cargo with the common cargo boom and hoisting rig, what part of the gear is subjected to the greatest stress?

A. The greatest stress is always found at the heel of the boom.

Q. How is a sea anchor hauled in?

A. A sea anchor is hauled in by its tripping line, which upsets it, so that it is brought in small end first. This greatly reduces resistance to its passage through the water.

Side Lights on the Rules

In this, the tenth article in the Side Lights on the Rules series, we shall continue the comparison of the International Rules with the local rules to prevent collisions by turning to Rules 12, 13, and 14. International Rules, and comparing their provisions with the equivalent provisions in waters subject to Inland, Western Rivers, and Great Lakes Rules.

Rule 12, International Rules, states:

Rule 12. Every vessel or seaplane on the water may, if necessary, in order to attract attention, in addition to the lights which she is by these rules required to carry, show a flare-up light or use a detonating or other efficient sound signal that cannot be mistaken for any signal authorised elsewhere under these rules.

There are no equivalent provisions in the rules applicable to Western Rivers or the Great Lakes. However, Article 12, Inland Rules, contains essentially the same provisions regarding vessels, although the terminology differs:

Art. 12. Every vessel may, if necessary, in order to attract attention, in addition to the lights which she is by these rules required to carry, show a flare-up light or use any detonating signal that cannot be mistaken for a distress signal.

Under both Rule 12, International Rules, and Article 12, Inland Rules, a flare-up light is held to be any white light, such as a lantern or flash light. Again, the two rules are similar in prohibiting detonating or other sound signals where they conflict with signals authorized for some other purpose.

Rule 13, International Rules, on the other hand, is a two fold rule which in part corresponds to provisions for the Inland Waters, the Western Rivers, and the Great Lakes. The first part of this rule authorizes *additional* signals in the following terms:

Rule 13 (a). Nothing in these Rules shall interfere with the operation of any special rules made by the Government of any nation with respect to additional station and signal lights for ships of war, for vessels sailing under convoy, or for seaplanes on the water; or with the exhibition of recognition signals adopted by shipowners, which have been authorised by their respective Governments and duly registered and published.

Essentially the same provisions for vessels are to be found in Article 13, Inland Rules, which reads as follows:

Art. 13. Nothing in these rules shall interfere with the operation of any special rules made by the Government of any nation with respect to additional station and signal lights for two or more ships of war or for vessels sailing under convoy, or with the exhibition of recognition signals adopted by shipowners, which have been authorized by their respective Governments, and duly registered and published.

There are no equivalent provisions, however, in the rules applicable to the Western Rivers or the Great Lakes.

Perhaps the most commonly known additional signal lights prescribed under Rule 13 (*a*), International Rules, and Article 13, Inland Rules, are the additional green lights at the masthead and yardarms carried by mine sweepers.

The next part of the rule exempts Naval and Coast Guard vessels of special construction from carrying lights interfering with the military functions of the vessels. To get its true meaning, it is necessary to read

IT IS SUGGESTED THE READER REFER TO CG–169, "RULES TO PREVENT COLLISIONS OF VESSELS AND PILOT RULES FOR CERTAIN INLAND WATERS OF THE ATLANTIC AND PACIFIC COASTS AND OF THE COAST OF THE GULF OF MEXICO;" CG–172, "PILOT RULES FOR THE GREAT LAKES AND THEIR CONNECTING AND TRIBUTARY WATERS AND THE ST. MARYS RIVER;" AND CG–184, "PILOT RULES FOR THE WESTERN RIVERS AND THE RED RIVER OF THE NORTH;" WHICH CONTAIN THE LOCAL RULES TO PREVENT COLLISIONS BETWEEN VESSELS ON THE LOCAL WATERS OF THE UNITED STATES. REFERENCES TO RULES AND ARTICLES THROUGHOUT THIS SERIES MAY BE FOUND THEREIN.

Rule 13 (*b*), International Rules, with Section 2 of the act of October 11, 1951, as amended, enacting the International Rules:

Rule 13 (b). Whenever the Government concerned shall have determined that a naval or other military vessel or waterborne seaplane of special construction or purpose cannot comply fully with the provisions of any of these rules with respect to the number, position, range or arc of visibility of lights or shapes, without interfering with the military function of the vessel or seaplane, such vessel or seaplane shall comply with such other provisions in regard to the number, position, range or arc of visibility of lights or shapes as her Government shall have determined to be the closest possible compliance with these rules in respect of that vessel or seaplane.

Sec. 2. Any requirements of such regulations in respect of the number, position, range of visibility, or arc of visibility of the lights required to be displayed by vessels shall not apply to any vessel of the Navy or of the Coast Guard whenever the Secretary of the Navy or the Secretary of the Treasury, in the case of Coast Guard vessels operating under the Treasury Department, or such official as either may designate, shall find or certify that, by reason of special construction, it is not possible for such vessel or class of vessels to comply with such regulations. The lights of any such exempted vessel or class of vessels, however, shall conform as closely to the requirements of the applicable regulations as the Secretary or such official shall find or certify to be feasible. Notice of such findings or certification and of the character and position of the lights prescribed to be displayed on such exempted vessel or class of vessels shall be published in the Federal Register and in the Notice to Mariners and, after the effective date specified in such notice, shall have effect as part of such regulations.

There are no equivalent provisions in the Inland, Western Rivers, or Great Lakes Rules themselves. Article 30, Inland Rules, Rule 14, Western Rivers Rules, and Rule 13, Great Lakes Rules, merely make it possible to suspend the exhibition of any light on board a vessel of war or a Coast Guard cutter of the United States. Section 5 of the act of May 21, 1948, provides in turn that in the event Naval or Coast Guard vessels of special construction are exempted from compliance with any requirements of the International Rules, such vessels shall similarly be exempt from compliance with any corresponding requirements applicable to the Western Rivers.

However, the act of December 3, 1945, as amended, provides similar exemptions in waters subject to Inland, Western Rivers, or Great Lakes Rules. This act is the counterpart of Rule 13 (*b*), International Rules, in its limited application to Naval and Coast Guard vessels of special construction.

To date, a number of Naval and Coast Guard vessels of special construction have been exempted from literal compliance with the Inland and International Rules. In general, however, the sole variation in requirements has been to foreshorten the separation of required lights or, as in the case of aircraft carriers, to offset the required range lights from the centerline. This authority is not a basis for indiscriminate individual lighting arrangements, and every attempt has been made to maintain the nature and spirit of the literal requirements insofar as possible.

Rule 14, International Rules, which will complete the present discussion, reads as follows:

Rule 14. A vessel proceeding under sail, when also being propelled by machinery, shall carry in the daytime forward, where it can best be seen, one black conical shape, point upwards, not less than 2 feet in diameter at its base.

The purpose of this rule is to meet the need for a signal denoting that a vessel under both sail and power must, under the provisions of Rule 1 (c) (iv), International Rules, obey the rules for a power-driven vessel.

There are no equivalent provisions in the rules applicable to Inland Waters, the Western Rivers, or the Great Lakes, though these rules also require a vessel propelled by both sail and power to conform to the rules applicable to power-driven vessels. Article 14, Inland Rules, is similar in intent, but is now practically obsolete. It reads :

Art. 14. A steam vessel proceeding under sail only, but having her funnel up, may carry in daytime, forward, where it can best be seen, one black ball or shape two feet in diameter.

Once again we can see that there are a number of minor differences in content with many differences in presentation in the respective rules to prevent collisions. In the next issue, when the respective restricted visibility requirements are compared, these differences will become even more pronounced.

COLOR AND SAFETY

(*Continued from page 107*)

Possible shipboard applications are:

(*a*) For traffic control:

(1) Aisles and passageways.

(2) Directional signs.

(3) A line marking the 3-foot coaming clearance in the 'tween decks.

(*b*) For housekeeping:

(1) Location of refuse cans.

(2) Drinking fountains and food-dispensing equipment locations.

(3) Clear floor areas around first aid, fire fighting, or other emergency equipment.

When installing a color system to mark the different hazards it is well to keep in mind that mere marking of a physical hazard with a color warning is no substitute for the complete elimination of the hazard wherever possible. Further, care should also be taken not to use these "safety colors" indiscriminately where no real hazard exists or their value as "quick attention getters" will be lost. For the same reason if the area painted is too large, the hazard may be overlooked in the resulting kaleidoscope of color.

Highlight the hazard, but don't convert the ship into an abstract painting.

SAFE GANGWAYS

The one piece of a vessel's equipment which must be utilized by all persons boarding or leaving the ship is the gangway, of which an accommodation ladder is a special type. For this reason it must be sturdy, properly rigged, and kept clear, clean, and well lighted.

There are numerous types of gangways in use on merchant vessels, and, although there are no specifications regarding their construction issued, constant observations are made to detect faulty and unsafe gangways. All defective conditions are required to be remedied immediately.

A sturdy gangway must be constructed so as to permit it to be extended at a proper angle without sagging or jeopardizing the safety of persons using it. For if the angle is too steep, those coming down may lose their balance and be unable to check their fall. Those going up could very easily lose their footing on a steep gangway and suffer painful results. Gangways must also be constructed of sufficient width so as to permit safe passage by persons carrying baggage, tools, stores, and other items which are generally not hoisted or lowered with the ship's gear.

The gangway must be properly secured to the vessel and completely rigged before persons are permitted to come aboard or leave the vessel over it. This includes securely fastening the stanchions and installing hand lines in at least two courses through the stanchions. These hand lines are only of value when tight and securely fastened.

The gangway itself must be rigged in such a manner as to make the treads as level as possible. In situations where this is impossible, duck boards shonld be laid over the treads to supply firm footing. These duck boards should be securely fastened to the gangway. One type of gangway in use today has the duck boards fastened to the gangway with hinges so that they can be dropped in place at a minute's notice. This type of arrangement has another advantage in that when the duck boards are secured to the stanchions when not in use they prevent a person who has fallen on the gangway from going overboard under the lower hand line.

Another important item to consider in rigging a gangway is to see that it is properly lighted at night. The practice of rigging a cargo light at the head of the gangway, facing downward, is not considered satisfactory. Such a light glares into the face of a person coming aboard, thereby blinding him and possibly causing him to lose his balance or miss a step. Such a light is also hazardous to a person descending the gangway, in that with the light at his back his shadow will hide the treads from his view thus endangering his safety. A more satisfactory lighting arrangement is to have a series of shielded lights running from the head of the gangway to the foot via a properly insulated extension cord, with a light at the top and bottom and one at each stanchion. This arrangement gives plenty of light at both ends, including the dock around the foot of the gangway, and also lights up every step without interfering with the user's vision.

Generally the gangway on a cargo vessel is rigged to the turntable platform at the main deck, although at times it is necessary to forego this arrangement in favor of a brow gangway. Where this gangway is secured above the deck, such as is the case where it is fastened to the bulwark or rail, proper means of reaching the deck should be provided. This should be done by providing a suitable landing platform and steps to the deck level, and also by providing sturdy hand lines from the head of the gangway to the deck.

Gangways to passenger vessels are usually furnished from shoreside and rigged by shoreside personnel. They are generally of the ramp type, with only a slight inclination to them, and because of their sturdy construction do not present as great a hazard as the ordinary gangway. However because of the large number of persons who use them they must be constantly attended and maintained in a safe manner. Passengers coming aboard are generally preoccupied and not too concerned about their footing and should be given every protection possible.

Where traveling cranes or railroad cars are moving up and down the dock a particular problem arises with regard to providing safe access to the vessel. The gangway must be kept clear of the tracks, but must not be left hanging out over the water, thereby requiring a certain amount of agility and luck to get aboard or off the vessel. In such a case as this a platform may be built on the dock to hold the roller of the gangway clear of the track with sufficient steps leading to the platform to permit safe passage. Otherwise the gangway should be rigged parallel to the vessel with a landing platform at the dock level, with an extended gangway to the dock if necessary. Such an ar-

rangement requires constant attention to see that it remains at the proper height.

Where the roller of the gangway rests on the dock it should always be placed in such position as to permit it to move without obstruction as the vessel rises and falls as a result of tide changes and cargo operations.

Regardless of the precautions taken to prevent such accidents, numerous persons fall between the ship and the dock, often with fatal results, each year. For this reason many steamship organizations require that safety nets be placed under the gangway at all ports. All persons who board the vessel are not necessarily familiar with gangways. It is also a fact that a large number of gangway accidents occur as a result of crew members attempting to board the vessel while under the influence of alcohol.

In order to afford maximum protection when used, safety nets should be rigged so as to extend approximately 6 feet beyond the top, bottom, and sides of the gangway. Special problems arise in rigging a safety net under particular gangways. Some of these problems are illustrated in figures 1 through 3.

As can be seen from these illustrations a particular problem poses itself with the use of gangway nets, that is, they may become rat runs unless rat guards are placed over the lines securing them to the ship or dock.

Another point to consider in rigging safe gangways is to see that there are a sufficient number to prevent overcrowding. This precaution must be exercised particularly on vessels in shipyards where large numbers of personnel are coming and going when shifts are changing. Overcrowding may also occur on passenger liners on sailing days, etc.

Properly rigging the gangway is only half of the problem of keeping it safe for those who use it. Constant attention must also be given to maintaining the gangway in a safe manner by keeping it clean and clear of foreign materials and obstructions.

One of the most important items in maintaining a gangway is to keep the hand lines in proper condition. As the position of the vessel in the water changes as a result of cargo operations or tidal conditions, the hand lines must be loosened or tightened as required. Slackness in the hand lines is a hazard which should be corrected immediately. On the other hand if too much strain is placed on the hand lines, they may snap, or may bend the stanchions.

One means of rigging a gangway, to eliminate as much as possible the constant changing of hand lines, is to rig the hand lines of the gangway separate from those of the turntable. That is, the hand lines from the gangway are fastened securely to the head and foot stanchions, and then separate hand lines are threaded through the stanchions of the turntable and fastened securely to the vessel. In this manner the tension on the hand lines remains the same when the vessel rises and falls.

If the gangplank roller is resting on the dock and the bridles are not needed they should be secured clear of the gangway. When required to hold the gangway in place a strain should be kept on the bridles to keep them from interfering with passage on the gangway.

Most gangways are constructed with nonskid treads of various types. If these treads do not have a permanent nonskid surface such surfaces should be renewed as required. A great many abrasive products are available for this purpose.

Another means of preventing slips on gangways is to keep them, and the area around them, such as docks and decks, free of oil, grease, or other slippery material. If it is impossible to clean up such areas immediately the hazardous substance should be covered with sand, cinders, sawdust or other antislip material until removed.

In order to keep the gangway properly maintained, and to render any assistance necessary to persons coming aboard or leaving the vessel, gangway watches should be manned by competent personnel. Those assigned to this task must make frequent inspections of the gangway and its various parts to see that it is safe and accessible at all times. For this reason a gangway watch cannot be stood properly from the recreation or mess rooms. The gangway watch should always check to see that a ring life buoy with a lanyard attached is close at hand and ready for use in any emergency.

In addition to being sturdy, properly rigged, and well maintained, a gangway is safe only if used properly.

The following is an example of how not to use the ship's gangway or accommodation ladder:

Recently a seaman was returning to his vessel after "A night on the town." As he staggered down the dock he spied a kitten, which he decided to take aboard. With both hands on the kitten he attempted to board the vessel. Unfortunately the kitten's 9 lives and the seaman's 1 ran out that night. He apparently fell overboard as the night mate heard the kitten crying under the dock. In spite of all possible rescue efforts the victim's body was not recovered for several days.

Two of the most prevalent causes of gangway casualties, which in themselves make up a large share of the total number of vessel accidents, were present in this incident. First, the seaman attempted to board the vessel while under the influence of liquor, an extremely hazardous undertaking, and secondly, one hand should have been free to hold onto the handline. ONE HAND FOR THE SHIP—ONE FOR YOURSELF.

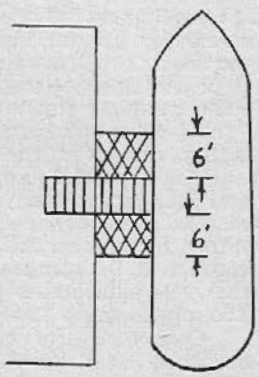


Figure 1. Indicates athwartship brow gangway with safety nets extending from each side.

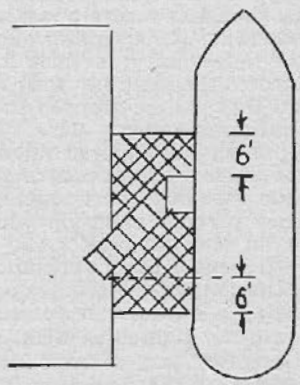


Figure 2. Shows the usual type gangway arrangement with gangway secured to the turntable, and the safety net extending all around platform and ladder.

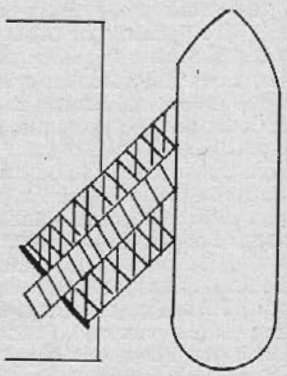


Figure 3. Indicates a gangway with spreaders employed to hold safety net out from each side of the gangway. This arrangement gives maximum protection and requires minimum net area.

(*Continued from page 109*)

indicated above sufficient salt and cool water will prevent this illness, but there may be those who have been advised to abstain from salt by their doctor because of high blood pressure, heart disease, kidney disease, etc. These persons should of course follow the advice of their doctor, but it is not contemplated such individuals will be playing nursemaid to an evaporator in the engine room with temperatures over the 100 degree mark, or doing other work of the type set forth above.

Proper clothing, proper diet, and proper conduct during hot weather or while working under extremely hot conditions are also important factors to consider in preventing heat sickness. This is true whether aboard ship or ashore.

Clothing must be suitable and by all means sensible. This applies equally to the proper wearing or nonwearing of it. If the clothing worn is too heavy, body heat is held in and it is difficult for perspiration to evaporate. For this reason clothes should b light and loose. If not enough clothing is worn, particularly a hat, when exposed to the hot sun, sunburn or sunstroke may result. This statement is not intended to belittle the effect of the sun's rays, which are beneficial in small amounts. The body should be exposed to them gradually, however, in order not to burn the skin. So when working on deck in hot weather, keep a hat on and don't take your shirt off for any extended periods at first.

Since the heat which the body generates comes from the food we eat, it is possible to reduce this heat and the functions entailed in eliminating it from the body in hot weather by proper dieting. Depending on individual conditions it may be possible to reduce the amount and types of foods consumed. Heat producing foods may be replaced by energy producers, and lighter diets substituted for the heavier ones, however it is essential that a well-balanced diet be maintained. It is also better to eat smaller amounts of food at frequent intervals rather than one or two large meals during hot weather days.

When hot weather comes on, strenuous or unusual exercise should be undertaken gradually. This refers to exercise which the body is not adjusted to doing in a routine manner and includes all types of recreation. When performing hard work under extreme heat, frequent rest periods should be taken. If overheating should occur, the cooling off process should be a gradual one.

In traveling from one type of climate to another, especially from a cold climate to a hot and humid climate, the body should be permitted to become acclimated to the new conditions before being subjected to rigorous or strenuous activity. In tropical areas excessive sweating and the resulting loss of salt and water from the system may not be as noticeable because of strong breezes, etc. For this reason particular care should be taken in these areas to see that the body is supplied with sufficient amounts of these elements.

Every effort should be made to avoid heat sickness, since besides making the person ill, it is also an industrial accident hazard. A person who is not feeling well as a result of becoming overheated may not be alert to dangerous conditions, or if feeling weak or dizzy may fall into machinery, or may fall from a ladder or gangway, thereby sustaining serious injuries.

The precautions for preventing heat sickness listed above are simple, requiring only common sense to follow. They have beeen proved effective.

Where heat sickness does occur, first aid should not be given, beyond moving the victim to a comfortable place, until it is determined just which type of heat sickness he is suffering from. As will be seen from the table below, the treatments for heat exhaustion and heat stroke are entirely different.

If at all possible a doctor should be summoned when a person collapses in hot weather.

Since the victim of heat stroke will have a dry skin and a high temperature, this is the best means of distinguishing this illness from heat exhaustion. Use a thermometer to take the victim's temperature and if it is high, 105° or higher, or is rising steadily from 102°, give first aid for sunstroke. If the victim's skin is cold and moist, he should be treated for heat exhaustion.

Treatment of heat exhaustion is the same as that of *heat cramps*. These two conditions must be clearly distinguished from *heat stroke*.

The principles involved in the treatment of heat stroke are best understood if studied in comparison with the treatment of heat exhaustion, as in the following table*:

Heat Exhaustion and Heat Cramps	*Heat Stroke*
The purpose of treatment is to restore salt balance, stimulate the patient, restore circulation, and raise temperature to normal.	The purpose of treatment is first to reduce fever, to restore salt balance, and to stimulate the patient if he shows signs of failing circulation or respiration.
Remove the patient to a *comfortable* place where he can rest. Loosen his clothing and place his head and shoulders slightly lower than the rest of the body. If the patient is cold or shows signs of shock, put a hot-water bag to his feet. Wrap him warmly in blankets and give warm liquids such as coffee or tea. Brisk massage of the skin will help to stimulate circulation. Treat pain caused by cramping muscles by massage and hot-water bag.	Remove the patient to a *cool* room. Remove his clothing and lay him in a comfortable position. Put an ice bag to his head and neck; give a brisk alcohol rub to the entire body for 5 minutes while an assistant fans the patient. This should be repeated every 15 minutes until temperature is reduced to nearly normal (*do not* use a cold tub or cold pack or other drastic method of cooling the patient as this may induce collapse).
Give mild stimulants such as coffee or tea to drink. If the patient shows definite signs of impaired circulation or respiration, such as fast, weak pulse or shallow respirations, caffeine sodium benzoate may have to be given by hypodermic injection, or aromatic spirits of ammonia, one-half teaspoonful in one-fourth glass of warm water.	No stimulants should be given unless collapse is imminent as indicated by change in pulse from a full, strong, bounding pulse to a weak, rapid, thready pulse, or unless the respirations become very shallow.
Give salt tablets, 1 tablet in a glass of water every hour for 6 hours. Give the patient all the water he will drink.	Give salt tablets, 1 tablet in a glass of water every hour for 6 hours. Give the patient all the water he will drink.
Keep the patient in bed until fully recovered.	Keep the patient in bed until fully recovered.

*The Ship's Medicine Chest and First Aid at Sea.

LESSONS FROM CASUALTIES

CONSIGNED TO THE DEEP

"For want of a nail, the kingdom was lost. For want of an adequate bilge pump, the ship was lost." Thus may be summed up the total loss of a $90,000 fishing vessel recently off the Atlantic Coast. Taking water while laboring in heavy seas, this vessel, which was rebuilt only three years before and was apparently in excellent condition otherwise, met her demise due to a technical failure of her bilge pumping system, which could have been foreseen but was not.

En route to the Gulf for wintertime fishing, this vessel was heading south and encountered fairly stormy weather in the vicinity of Cape Hatteras. Early in the morning of the fateful day, a heavy boarding sea from the starboard quarter forced open the after door of the deck storage area on the fantail, with considerable sea water running down through the crew's quarters into the engineroom, partially flooding it. The engineroom was equipped with three centrifugal type bilge pumps. One of these pumps, which was normally kept in continuous operation with the discharge bypassing sea water when the bilges were dry, pumped out most of the initial flooding. However, it was then noted that the water in the engineroom bilges was gaining, indicating a leak somewhere in the vicinity of the engineroom.

An additional bilge pump on the main engine was then placed in operation and, a little later, another pump working off the auxiliary engine. As the water level approached the vicinity of these pumps, water and oil on the V-belt drives on these pumps caused slippage and considerable difficulty was experienced in keeping the pump rotor turning.

After the boarding sea had damaged the door, the vessel was brought to, and the damaged door repaired and shored up. Heavy seas were now running and the vessel was kept hove to, using her engines to control her heading, in the attempt to maintain her position and await more favorable weather. The water level in the engineroom bilges was kept about steady until late in the afternoon when it started to gain. As the draft increased aft, the leakage seemed to increase in proportion. All efforts to locate the leak failed, as the cold oily water slopping around in the engineroom bilges made it most difficult to accomplish any useful work in the vicinity. Trying to locate a leak under such conditions was well nigh to impossible.

Inasmuch as the fish hold and forecastle remained dry, it appeared that the leak was in the after part of the vessel, most likely somewhere in the engineroom bilges or in the vicinity of the stern tube. The crew of three men formed a bucket brigade and made every effort to improve the operation of the bilge pumps, but the water level still gained. Two of the bilge pumps were by now practically useless due to the slippage of the V-belt drives and were discharging next to nothing.

A distress call was sent about 6:00 p. m., which was picked up by a tank vessel in the vicinity and by the Coast Guard. The tank vessel immediately headed for the distressed vessel as did other help.

By 8:00 p. m. both main engines had stopped due to the water level in the engineroom. At this time the fish hold and forecastle were partially flooded, the bulkheads having leaked or the hull having opened up somewhere forward, due to the tossing and straining of the vessel, since the bilge suction lines to these forward spaces had been closed and checked.

About 10:00 p. m. the tanker arrived on the scene and stood by to take off the three men. As the fishing vessel was no almost awash, her crew launched their 16-foot lifeboat, which was seaworthy and in excellent condition, and abandoned ship. They were picked up safely by the tank vessel. As the tanker departed from the scene to proceed on her voyage, the fishing vessel was last observed fully awash and in a capsizing condition. It undoubtedly sank within moments.

While this casualty had a happy outcome as far as the safety of the lives of the men involved was concerned, it was most unfortunate that a valuable property representing a considerable investment by the owner was sacrificed to the whims of Neptune, due to the technical failure of the bilge pumps.

It appears quite reasonable to assume that this vessel could have arrived safely in port if her 3 bilge pumps had remained in operating conditions, since the flooding only became serious after the 2 belt-driven pumps had defected and the vessel started to get too heavy by the stern. It is impossible to foresee every adverse or crippling circumstance which can affect the operation of any vessel's machinery or equipment, but the provision of a positive type of drive for the above bilge pumps would certainly have paid off in this instance.

The failure of the V-belt drive due to slipping caused by oily water sloshing on the belt can also be used as another strong argument for the good house-keeping practice of maintaining bilges clean and free of oil. Undoubtedly the oil which was present in the water, and which caused the belts to slip, had been in the bilges before the leakage began, and thus contributed so vitally to the loss of a ship.

THE DECK WAS STACKED

The life of an experienced and able chief mate was lost last winter when he momentarily neglected the old seamen's adage—"One hand for the ship and one hand for yourself." After devising a carefully worked-out plan to jettison part of a deckload of lumber (see figure 1) and deciding that each man who mounted the deckload would be secured by a lifeline and would wear a lifejacket, the chief mate then failed to observe his own safety decrees and forfeited his life.

A deckload of over 1,000,000 board feet of lumber had been carefully stowed and secured on the main deck of the coastwise lumber vessel. Deck cargo varied in height from 2 packages high at the forward end of the long expanse of open deck, to 4 packages high at the after end. Each set of deck cargo was approximately 16 feet long and secured with not less than 2 chain lashings. The chain lashings consisted of three fourths inch chain secured from padeyes on deck and were adjustable by means of turnbuckles and pelican hooks. A crane mounted on deck for handling cargo was used to tighten the chain lashings. When all deck cargo packages were in place and the lashings tightened as much as possible by the crane, all the turnbuckles were set up so that the deck stowage was as taut as possible.

Upon departure from port, the weather prediction was for winds in gusts up to 40 miles per hour. The deck watch checked all cargo lashings periodically and turnbuckles were set up as necessary, using a bar or pipe.

About 4 hours after darkness set in, the vessel was struck by an unusual and heavy swell which rolled her heavily to leeward and part of the deck cargo of lumber shifted to port. The vessel did not recover from this roll and maintained thereafter a heavy list to port. The master was immediately apprised of the situation and decided that some of the deck

cargo would have to be jettisoned immediately to restore the trim of the vessel. He passed orders to the chief mate to carry out this jettisoning procedure.

After conferring with the third mate and two AB seamen, the chief mate decided that each man who would climb up on the lumber packages to release pelican hooks would wear a lifejacket, be secured with a lifeline, and would be tended by another man. The third mate and one seaman departed immediately to get lifelines and a fire axe. When the third mate returned he heard voices in the dark on top of the deck cargo. Upon investigating, he saw the chief mate and a seaman working on top of the deck cargo and noticed that they already had 2 or 3 chain lashings released. He further noted that neither man was wearing a lifejacket nor was secured by a lifeline. In the darkness and wet, the third mate realized the danger of anyone attempting such a hazardous procedure, especially with the severe list to port, and he shouted a warning to the men on the lumber piles. The seaman ran aft and climbed off the lumber piles just as two packages of lumber began to go. With a crash, they slid over the side.

One brief cry was heard from the darkness. The chief mate could not be found. Word of a "man overboard" was shouted to the bridge. The helmsman immediately reported that he had seen the chief mate trying to release a pelican hook and had seen him slide over the side with a portion of the deck cargo.

Lighted ring buoys were tossed overboard. The engine was slowed and all searchlights manned. The lee lifeboat was made ready for launching, but due to the rough seas with lumber tossing wildly about, the master deemed it unwise and dangerous to attempt to launch a lifeboat. One seaman reported hearing a faint call for help from off the port quarter. Messages were sent to the Coast Guard and all vessels in the vicinity to keep a lookout for the missing man. The lumber vessel remained in the vicinity all night but it was hopeless. The chief mate was not seen again.

After the jettisoning of deck cargo, both intended and accidental, the vessel returned to a somewhat more even keel and the remainder of the list was removed by the use of the ballast tanks. The voyage was continued without further mishap, but under the pall of the tragic and needless loss of a good shipmate.

No determination can ever be made as to why the chief mate, after deciding that extreme safety precautions were absolutely necessary for this hazardous task, chose to expose himself and a seaman to the maximum danger by climbing out on that precarious perch without lifejackets or lifelines. Unfortunately, the lesson learned by the chief mate in that awesome moment as he slid toward his doom could never again be utilized by him. When spotted by the helmsman, the chief mate was trying to release the forward chain lashing on the second package of lumber, counting from aft, port side. Whether he actually released the pelican hook quicker than he expected or whether part of the turnbuckle failed could not be determined.

However, regardless of the exact cause of that fateful avalanche, the greatest failure was in the judgment of the experienced seaman who placed himself in such a position, somewhat akin to the man who sits on a tree limb and saws it off between himself and the trunk. In view of the long and able experience of the chief mate, it must be presumed that he took this precipitate and ill-advised action fearing only for the safety of the ship and believing that the need for quick measures to jettison some of the cargo justified hazarding his personal safety to such an extent. Unfortunately the facts of the case did not justify this haste which cost the chief mate his life. His loss can be attributed to devotion to duty—well meant but hasty.

JACOB'S LADDER TO ETERNITY

No premonition of disaster was felt aboard the large tanker as she started toward the harbor entrance, and the crew prepared to receive the pilot for the trip up the channel. It was about 11 p. m. on a cold and windy January night. There was a moderate swell with a choppy cross sea as the channel buoys loomed up.

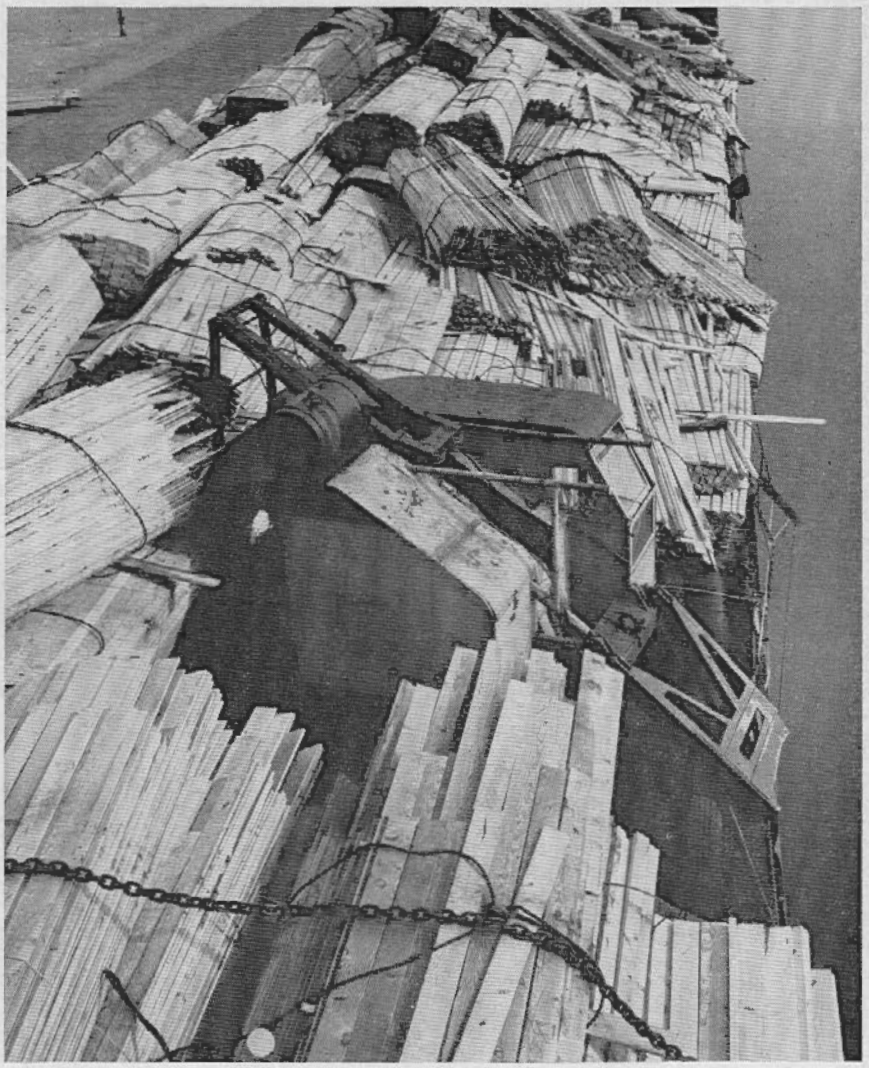


FIGURE 1.

Promptly on schedule, the dependable pilot vessel hove alongside as the tanker's engines were checked down. The wind seemed to be variable in gusts from the north and east. Since the tanker was about on a westerly heading, there was some lee on the port side. A boarding ladder was rigged on the port side of the tanker just abaft the midship deckhouse, and a boat rope about 150 feet long was rigged forward of the deckhouse and led back to about the middle of the welldeck. Freeboard at the ladder was just under 11 feet. A floodlight was directed from the port wing of the bridge to the surface alongside the ladder. The tanker was now underway with bare steerageway at 2 or 3 knots. Due to the cross sea and variable winds, there was considerable sea, with heavy swells alongside to port.

In a routine manner, the pilotboat launched its yawl to transfer a pilot to the tanker, just as it had done time after time for many years. There was nothing about the arrangements made or the handling of the tanker which caused any concern by the men of the pilot vessel, and three of them entered the yawl. One of these men had over 10 years' experience as a pilot, and the other two had 8 years' and 1 year's experience, respectively, as pilot boatkeepers. The yawl, with the three men in it, was towed astern of the pilot vessel until about 75 feet from the side of the tanker, where it was cast off. With a few strokes of the oars, the two boatkeepers had the yawl alongside. For a minute or two the men in the yawl held firmly to the tanker's boat rope waiting for a quiet moment for the pilot to mount the ladder, as the sea alongside was turbulent and the small boat was tossed about quite severely. None of the occupants of the yawl was wearing a life preserver, although plenty were available on the pilot vessel.

Suddenly, before the horror-struck gaze of the pilot vessel's crew and the men standing by on the tanker, a large sea, making up from the stern of the deep-laden ship (breaking as it came and boarding the tanker at the welldeck level) caught the little yawl and pitchpoled her, stern over bow. The pilot and two boatkeepers clung to the tanker's boat rope for a moment and then were swept into the angry sea. Immediately there was a burst of activity by the men on the tanker and at least 9 ring buoys, 3 of which were lighted, were promptly gotten over the side. Due to the tanker's headway and the heavy seas running, men on deck quickly lost sight of those in the water and could not tell whether any of the ring buoys were reached by the struggling men in the water. All floodlights and searchlights on the port side were manned, "man overboard" signal was sounded on the ship's whistle, and a radio message was transmitted to the Coast Guard and all vessels in the vicinity. The master brought the tanker to anchor as quickly as possible and immediately considered the possibility of lowering his lifeboats.

In the meantime the warrant pilot controlling the pilot vessel had instantly appraised the situation and moved his vessel up to the position of the men in the water as quickly as possible. Men on the pilot vessel manned the rail. Sighting a survivor in the water they threw him a heaving line and pulled him close aboard. Unfortunately this man, who proved to be the boarding pilot, a man 40 years of age, lost his grip and disappeared in the black waters before he could be pulled aboard, and could not be located again. With the aid of a searchlight the pilot vessel then located one of the boatkeepers, also 40 years old, who was afloat close to the starboard bow. The boatkeeper was thrown a heaving line and managed to keep his grip on it until he could be grasped by the men on deck and pulled aboard. During the intense excitement and emotion of the looming tragedy, disaster in another form at this moment again struck the pilot vessel. One of the senior pilots in the struggling group collapsed on deck from a heart attack. The pilot vessel searched frantically for another 45 minutes, torn between despair at leaving the vicinity without finding the other two men and the urgent desire to get its heart-stricken pilot ashore for medical treatment. As the search then appeared to be hopeless in the dark and frigid waters, the pilot vessel headed for shore. Tragically, however, the pilot who had suffered the heart attack died before reaching a hospital.

Within minutes after the emergency broadcast from the tanker, other small vessels were seen in the vicinity of the accident, joining the search. Knowing that the pilot vessel itself was already at the vicinity of the men in the water and in the best position to rescue them, and noting the presence of other craft joining the search, the master of the tanker, which by then had moved on some distance from the point of the accident, decided not to lower his lifeboats.

The pilot who was almost within the grasp of the pilot vessel and the second boatkeeper were not located and perished in the sea. A "routine" pilot boarding had suddenly been transformed into stark disaster and three lives were lost.

A hazardous undertaking by nature, the boarding under the unfavorable conditions obtaining that stormy winter night should not have been undertaken with the additional hazard of a complete failure to use life preservers in the yawl. The question of wearing or not wearing life preservers whenever there is a chance of going overboard, such as painting over the side, handling mooring lines at the pier's edge, working or rowing in small boats, or entering lifeboats either afloat or hoisted for any purpose, is a question which has been debated amongst seamen for years. It is a question, however, to which there is but one realistic answer—wear them! Regardless of reasons advanced for not wearing them, there can be no argument as cogent or convincing as the case of the strong healthy man who dies before his time for lack of a little positive buoyancy when he most needs it.

It is a well-known human foible to risk one's life to save a moment or two of inconvenience, such as dashing across a busy street to save waiting for the traffic light, and no amount of imploring or imprecation will ever deter *all* persons from taking such actions. But there can be no possible doubt that, in the long run, the pedestrian who *does* wait for the traffic light, or the seaman who *does* habitually wear a life jacket stands by far the better chance of dying of old age. Like any other inconvenience, the inconvenience of wearing a life jacket quickly subsides as the habit is acquired and the degree of disability or inactivity entailed also diminishes as the wearer becomes accustomed to it.

Another factor which could have contributed to this sorrowful loss was the position of the boarding ladder suspended from the welldeck of the tanker. At this point, the height to which the boarding pilot would have to climb may be as much as 10 feet less than if the ladder were suspended from the bridge deck. However, when mounting a ladder suspended from the welldeck of a loaded tanker, the pilot is subject to a severe dousing when a boarding sea sweeps across the welldeck from the weather side, or even to being swept off the ladder. At least one group of pilots has gone on record as requesting loaded tank vessels to rig their pilot ladders from the bridgedeck, regardless of the greater height to be climbed, in order to avoid the effects of a boarding sea. It may well have been that the yawl used in the above disaster, if held alongside abreast the bridgedeck, rather than the open welldeck, would not have been swamped or capsized and the loss of life might have been avoided.

FREE OF CHARGE

The hazards of electrostatic charges which may be built up in various kinds of machinery and equipment have long been known to Fire Protection Engineers and all fire-fighting organizations. Whenever there is a flow of liquids or solids over the surface of a solid object which is not grounded, it is possible for a potential, an electrostatic charge, to be built up in the solid object, the amount of charge depending upon the nature of the materials. When this electrostatic potential is discharged in the form of a spark in the presence of any flammable or explosive vapors or mixtures disaster may result. The grounding of machinery, equipment, and other materials which may accumulate static charges where explosive materials may be present is a well-defined branch of Fire Protection Engineering.

That such a static charge may be accumulated in the hose and nozzle of a fuel-filling line and in the filling system in a boat as the fuel flows through may not be appreciated by many small-boat operators. Little imagination is required to picture the results of the inadvertent discharge of such an electrostatic potential between the nozzle of a gasoline-filling line and the metallic fill pipe or tank of a motorboat while gasoline is flowing. With a mixture of from 1.5 to 6 percent of gasoline by volume in air surrounding the fill pipe, an electrostatic discharge with a high voltage spark can blow such a motorboat sky high, or at least start a roaring fire.

A 38-foot gasoline-powered motorboat was thus destroyed recently when the operator forgot to guard against static spark. After arriving at a fueling dock, the operator inserted a bronze filling nozzle into the fill pipe of his center fuel tank in such a manner that the nozzle was grounded to the boat by direct metallic contact. The wooden-hulled boat was equipped with gas-tank vents which terminated through the vessel's hull just below the gunwale and the fill pipes from all tanks terminated properly and tightly at the deck level. A few minutes after gasoline started flowing into the tank, the operator lifted the nozzle with one hand in order to observe the fuel level in the tank, which at this time was only partly full. As he replaced the nozzle into the fill pipe, a tremendous blast occurred from the tank, blowing the operator onto the after deck. He immediately dove into the water to extinguish flames on his face, hands, and clothing. He was able to swim to another boat and was assisted to a local hospital where it was determined that he had suffered second degree burns of the face, head, hands, and one leg. The motorboat burned furiously and was extensively damaged before being extinguished by the local fire department. See figure 2.

This motorboat was abundantly equipped with fire extinguishers and a fixed CO_2 system, none of which was used since the only person aboard was temporarily disabled. It is not entirely certain how ignition of the explosion took place, but the facts known certainly indicate a static spark at the fill pipe. Since the nozzle, filling line, gas pump, and other attached parts were undoubtedly grounded to shore by way of a steel pipeline, tank structure, etc., no static charge would accumulate on the nozzle. However, since wood is an extremely poor conductor, the fill pipe and gas tank in the wooden-hulled boat would not be grounded to the water, and a static charge could develop in these parts due to the flow of gasoline as soon as the metal-to-metal contact between the nozzle and fill pipe was lost. When the operator lifted the nozzle, he thereby broke the ground connection which had existed and, since gasoline continued to flow, a static charge immediately began to accumulate on the fill pipe. Apparently sufficient potential was built up that when the nozzle returned to the fill pipe, the electric spark of static discharge was of sufficient heat to ignite the explosive gas-air mixture existing in the fill pipe and in the gas tank above the surface of the liquid. By such an apparently trivial detail in fueling this motorboat, there occurred a serious property loss and injuries which could have been disabling.

Automobile gasoline filling stations are invariably so designed that the filling and pumping equipment are

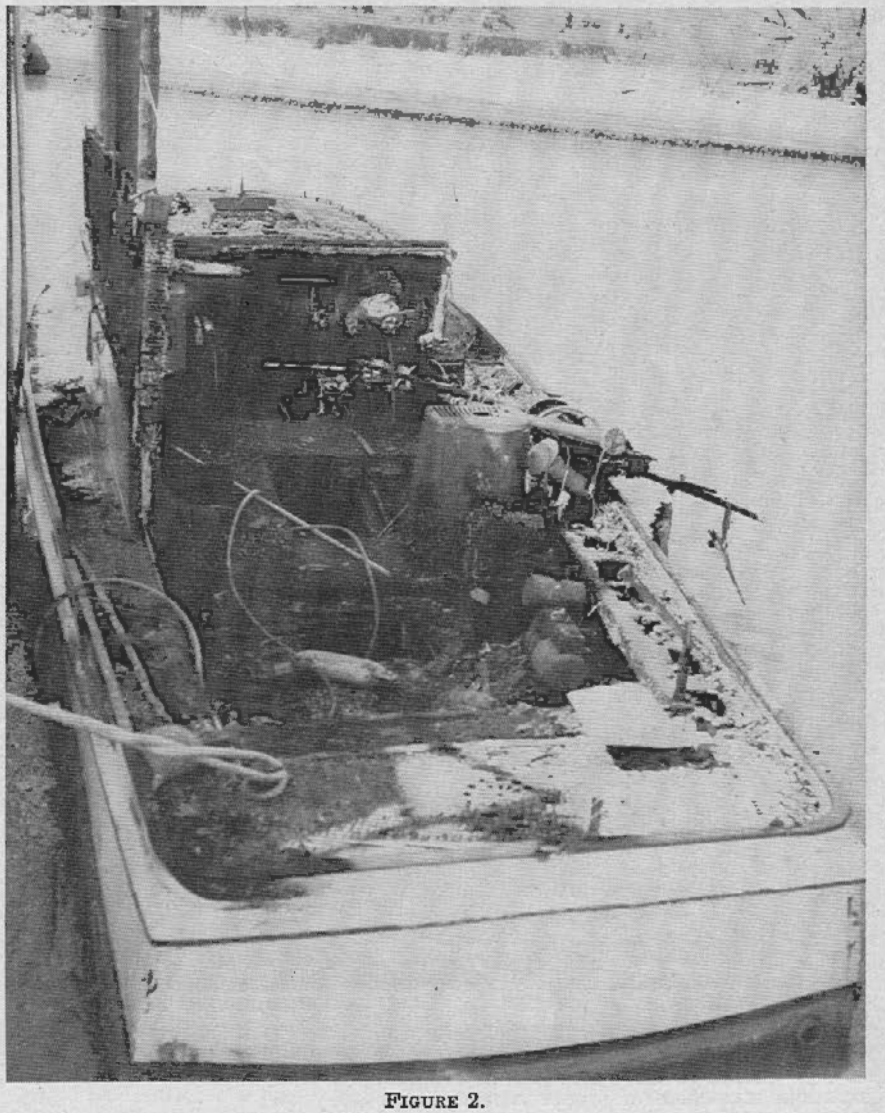
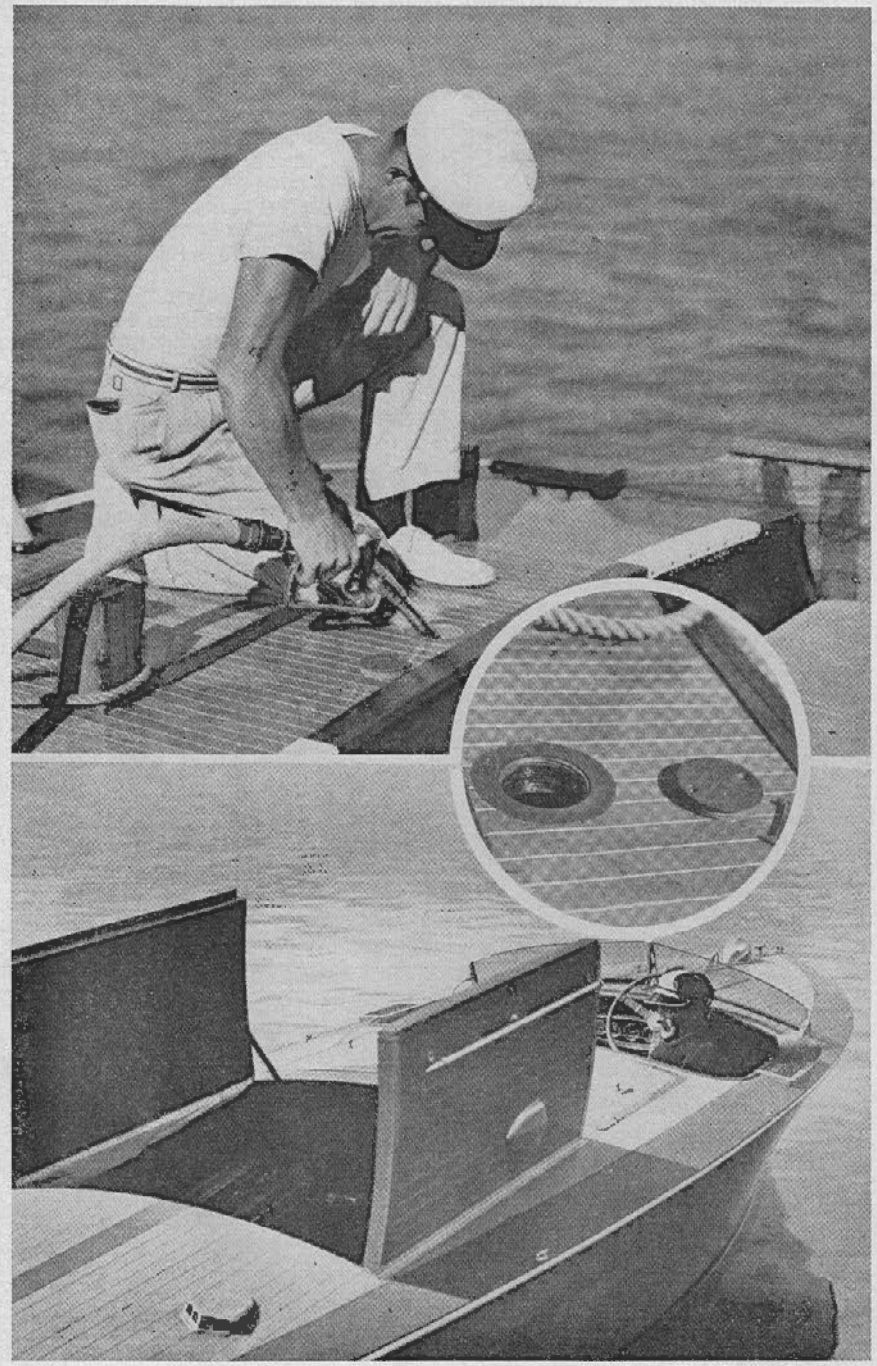


FIGURE 2.

grounded. In addition, automobile fill pipes and gas-delivery nozzles are usually so designed that it is almost impossible to fill an auto tank without metal-to-metal contact between the nozzle and fill pipe, and thus the automobile is also grounded. Therefore, the danger of explosion from electrostatic spark in automobile filling stations is extremely small and such casualties are rare. Due, perhaps, to this common knowledge or awareness, many persons are careless in fueling gasoline motorboats. While the filling system at marine fuel stations may be adequately grounded as described above, the motorboat itself, especially if wooden construction, may not be grounded at all, and the avoidance of an explosion from static spark will then depend on the maintenance of a metal-to-metal contact at the fill pipe.



Courtesy The Texas Company

FIGURE 3 illustrates a safe fuel operation. Note that the metal fill pipe is flush with the deck; that the filling nozzle is held tightly against the metal fill pipe during fueling; and that after fueling is completed the engine compartment is opened for proper ventilation.

The use of a bonding cable or wire which, when connected, forms a good electrical connection between the filling system and the tank being filled is usually required by local fire codes or other municipal ordinances whenever gasline or other flammable or combustible liquids and gases are transferred commercially, that is, into or out of commercial carriers or storage tanks. Bonding cables are required to be used in fueling government ships, boats, aircraft, etc. While the principle of bonding is important while fueling with any type of combustible liquid fuel, it is especially important while fueling with gasoline due to the low flash point and highly explosive characteristics of gas-air mixtures.

Bonding cables, although not required by law or government regulation while fueling private gasoline motorboats, would provide a strong safeguard against a static spark explosion, and their use is strongly recommended. A tight connection at both the filling system and fill pipe or tank should be made *before* the tank is opened and *before* any fuel flows, and the connection should not be broken until *after* fuel flow has ended and *after* the tank is closed. In the case of fueling from a system which is grounded by means of a pipeline, shore tank, etc., the explosion hazard exists from static charge which may be built up in the motorboat. However, in the case of fueling from a tank truck (with rubber tires which insulate it from ground) or from a drum or barrel of fuel, the explosion hazard exists from static charge which may be built up in *both* the motorboat *and* the tank truck or barrel. In the latter case the use of a bonding cable between tank truck and boat or between barrel and boat will be even more essential so that an electrostatic potential cannot build up between filling system and motorboat.

It is realized that the use of a bonding cable while fueling motorboats is not always possible. As a minimum precaution in the absence of a bonding cable, if the motorboat owner or operator will make sure the filling nozzle is held tightly against the metal fill pipe at all times while fuel is flowing, expensive and painful accidents due to static spark will be avoided. See figure 3. Remember—static electricity is insidious, silent and invisible—until the spark jumps, and then it may be too late!

APPENDIX

AMENDMENTS TO REGULATIONS

[EDITOR'S NOTE.—The material contained herein has been condensed due to space limitations. Copies of the Federal Registers containing the material referred to may be obtained from the Superintendent of Documents Washington 25, D. C.]

TITLE 46—SHIPPING

Chapter I—Coast Guard, Department of the Treasury

Subchapter N—Explosives or Other Dangerous Articles or Substances and Combustible Liquids on Board Vessels

[CGFR 54-3]

PART 146—TRANSPORTATION OR STOWAGE OF EXPLOSIVES OR OTHER DANGEROUS ARTICLES OR SUBSTANCES AND COMBUSTIBLE LIQUIDS ON BOARD VESSELS

SUBPART—DETAILED REGULATIONS GOVERNING THE TRANSPORTATION OF MILITARY EXPLOSIVES ON BOARD VESSELS

STOWAGE OF MILITARY EXPLOSIVES IN HOLDS CONTAINING MAIL AS CARGO

The second revision of the detailed regulations governing the transportation of military explosives on board vessels designated 46 CFR 146.29–1 to 146.29–100, inclusive, was promulgated as Coast Guard Document CGFR 54–3, dated April 2, 1954, and published in the FEDERAL REGISTER dated April 8, 1954, 19 F. R. 1975–2004, as F. R. Doc. 54–2623. A petition has been received requesting that certain provisions in these regulations be made the matter of a public hearing so that all persons and organizations may submit comments and arguments concerning the continuation of certain requirements as permanent regulations. Therefore, the specific regulations commented on, or objected to, which are now in effect, will be placed on the Agenda for a public hearing to be held by the Merchant Marine Council in September 1954 and will be published later as an item in a notice of proposed rule making. An objection to the new safety regulation designated 46 CFR 146.29–55 was received. This objection was with respect to the prohibition against stowage of military explosives in the same or adjacent holds with household furnishings and personal effects. The request that this requirement be not placed in effect at this time is granted and, therefore, the text of 46 CFR 146.29–55 is revised as set forth in this document, which shall be in effect on and after May 15, 1954.

Section 146.29–55 is amended to read as follows:

§ 146.29–55 *Stowage of military explosives in holds containing mail as cargo.* Unless expressly authorized by the Commandant of the Coast Guard military explosives shall not be stowed in a hold containing mail as cargo nor in any hold above, below or adjacent to one containing any mail as cargo. The foregoing does not apply on vessels having on board military explosives of the Class I category only.

[Federal Register of Friday, May 21, 1954]

NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 1–54

11 May 1954

Subj: Pamphlet entitled "Miscellaneous Electrical Equipment List," CG–293

1. *Purpose.* A pamphlet containing a list of miscellaneous electrical equipment, arranged by subjects, has been prepared primarily for the information of shipbuilders, naval architects, and other persons affected by or interested in the use of electrical equipment on board inspected vessels. This pamphlet contains only a list of items that have been investigated by the Coast Guard and found to comply with the applicable requirements in the "Electrical Engineering Regulations," CG–259.

2. *Background.* In order to expedite the evaluation of drawings of shipboard electrical installations submitted for approval and to promote uniformity of action thereon, this pamphlet containing a list of certain types of electrical equipment satisfactory for use on merchant vessels contracted for on or after 19 November 1952 has been prepared. This pamphlet is a loose-leaf booklet and it is anticipated that amendment sheets will be issued from time to time so that the listings can be brought up to date. Announcements of amendments will be made by subsequent Navigation and Vessel Inspection Circulars.

3. *Action requirements.* The prospective users of miscellaneous electrical equipment who desire to have a copy of this pamphlet should submit their requests to the Commandant (MMT), U. S. Coast Guard, Washington 25, D. C., or to the nearest Coast Guard Merchant Marine Inspection Office. The Coast Guard personnel concerned with the administration and enforcement of the navigation and vessel inspection laws, rules, and regulations will extend every possible assistance.

R. A. SMYTH,
Captain, U. S. Coast Guard.
Acting Chief, Office of Merchant Marine Safety, By direction of the Commandant.

EQUIPMENT APPROVED BY THE COMMANDANT

Editor's Note: Due to space limitations, it is not possible to publish the documents regarding approvals and terminations of approvals of equipment published in the Federal Register dated May 12, 1954 (CGFR 54–18). Copies of these documents may be obtained from the Superintendent of Documents, Washington 25, D. C.

FUSIBLE PLUGS

The regulations prescribed in subpart 162.014, subchapter Q, Specifications, require that manufacturers submit samples from each heat of fusible plugs for test prior to plugs manufactured from the heat being used on vessels subject to inspection by the Coast Guard. A list of approved heats which have been tested and found acceptable during the period from 15 April to 15 May 1954, is as follows:

The Lunkenheimer Co., Cincinnati 14, Ohio. Heat No. 478.

ARTICLES OF SHIPS' STORES AND SUPPLIES

Articles of ships' stores and supplies certificated from 29 April 1954 to 28 May 1954, 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

Kelite Products, Inc., P. O. Box 2917, Terminal Annex, Los Angeles 54, Calif. Certificate No. 155, dated 12 May 1954. "KELITE SPRAY WHITE."

TELL HIM NOW

If with pleasure you are viewing, any work a man is doing,
If you like him or you love him, tell him now.
Don't withhold your approbation until the parson makes oration,
As he lies with snowy lilies o'er his brow.
For no matter how you shout it, he won't really care about it,
He won't know how many tear drops you have shed.
If you think some praise is due him, now's the time to give it to him,
For he cannot read his tombstone when he's dead.

More than fame and more than money, is the comment kind and sunny,
And the hearty, warm approval of a friend.
For it gives to life a savor and it makes you stronger, braver,
Also gives you heart and spirit to the end.
If he earns your praise, bestow it, if you like him, let him know it;
Let the words of true encouragement be said.
Do not wait until life is over, and he's underneath the clover,
For he cannot read his tombstone when he's dead.

—*Lou J. Beauchamp.*

U. S. GOVERNMENT PRINTING OFFICE: 1954