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The Merchant Marine Council of the United States Coast Guard

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EDITOR'S NOTE

On July 1, 1954 Commander Eugene A. Coffin, Jr., USCG, relieved Captain G. A. Littlefield, USCG, as Executive Secretary and Member of the Merchant Marine Council. Captain Littlefield assumed the duties of Marine Inspection Officer, 9th Coast Guard District, Cleveland, Ohio on 1 August 1954.

SAFETY SUBJECTS

For Discussion and Action by Ship Safety Committees

PROBLEM: Words are an imperfect tool for transmitting ideas. Ideas are interchanged most readily when there is a common background of experience. The cat who sat on the hot stove would be most receptive to a discussion of hazards from hot steam pipes; that is, if she could talk. This leads us in a roundabout way to the question, "How do you make people aware of hazards they cannot see?"

Is it enough to tell a man that electricity can injure him and that shock hazards exist in certain places?

Is it enough to tell him that petroleum vapors will displace air in a cargo tank to the extent that the atmosphere will not sustain life and that the vapors are anesthetic?

We do not believe so. We believe that to get an idea firmly across, the idea must be expressed repeatedly in various ways. Ideas may be transmitted by example and attitude, by the spoken word, by the written word, by photographs, by cartoons and by posters.

Ideas can be transmitted by approaching them in a roundabout manner. For example, the teaching of first aid is an excellent method of accident prevention. Strange as it may seem, the treatment of pretended injuries leads men's minds and attentions to the prevention of real injuries.

On one company vessel, they approached the problem of teaching their men about the hazards connected with petroleum vapors as related to breathing by holding a special fresh-air breathing apparatus drill. During a tank-cleaning job, every member of the deck department and every member of the engine department was sent down to the bottom of a cargo tank, wearing the mask of the fresh-air breathing apparatus. We will hazard the guess that these men are firmly impressed with the idea that a concentration of petroleum vapors presents a hazard as regards breathing. Likewise, by indirection, that these men have more fully in mind the hazards from explosions of petroleum vapors.

What ideas do you have for making people aware of hazards they cannot see?

—Standard of California Safety Bulletin.

STATION BILLS AND EMERGENCY DRILLS

Station Bills are required to be prepared by the Masters of merchant vessels in order to *lay the groundwork* for well-organized and disciplined conduct on board such vessels during emergencies and emergency drills.

That is why simply posting the required Station Bills and furnishing each crew member with a card showing his emergency and boat station will seldom produce an efficient drill.

Station Bills perform a very important function in setting forth the required signals and instructions, as well as duty stations, for various emergency situations. However, more than this basic knowledge is required of each crew member in order that he may carry out his emergency duties properly. To gain a satisfactory measure of perfection and efficiency at emergency drills the posting of Station Bills must be followed by constant drilling and instruction.

Since the regulations promulgated by the Coast Guard provide for the posting of Station Bills and the assigning of crews to certain tasks during emergencies on board, it follows that some means of making each individual officer and crew member familiar with his emergency duties is necessary. This is one of the reasons why fire and boat drills are required to be held on board merchant vessels at specific intervals, also why detailed regulations are in force regarding the manner in which such fire and boat drills are to be held, what equipment shall be tested, and how often.

These drills should not be conducted hastily and perfunctorily just to form the basis for an entry in the Official Log Book. Such hasty and perfunctory drills defeat their own purpose—for only by constant instruction and drilling can an efficient organization be built up among the personnel aboard which will be capable of effective action should an actual emergency occur.

Several cases have recently come to the attention of Coast Guard Investigating Units wherein entries appeared in the Official Log Book to the effect that fire and boat drills had been held on a specific date when actually they had not. To the extent possible, charges under R. S. 4450 have been preferred against the Masters of the subject vessels and the cases brought before the Hearing Examiners.

Fires and explosions, collisions, and the like are not particularly respectful of merchant vessels, as it has been demonstrated time and again when those on board have failed to prepare themselves for such an eventuality. If for no other reason, emergency drills should be carried out religiously.

In the actual conducting of emergency drills, considerable ingenuity may be worked out by those on board in charge of such drills. They need not be restricted to fire and abandon ship exercises, just because only these two are mentioned on the Station Bill. In fact, it is often wise to deviate from the practice of having fire and boat drills together, or to at least reverse the order of the signals. Too often the signal for emergency drill finds the crew already standing by in life jackets with the fire pump going, since the drills are *always* held on a certain day and hour. Much is lost in the line of efficiency by this practice; for example, the watch standers do not participate in an emergency exercise week after week.

Station Bills list only the minimum emergency signals and instructions. Additional emergency signals may be established by the Master to signify a particular emergency, such as a collision situation. In such a case officers and crew will have certain and positive knowledge of an existing emergency. Care should be exercised in establishing additional emergency signals, however, to see that they do not conflict with standard navigation or other required signals.

Simulated emergency and rescue demonstrations, using actual emergency equipment, are invaluable. Much was done on board vessels during the war years along these lines, when there were daily instructions on many vessels. Crew members are still anxious to learn and should be given every opportunity to become thoroughly familiar with gas masks, oxygen breathing apparatus, life lines and all other emergency equipment on board. For no matter how efficient or extensive the safety devices are on board, they are only as good as the personnel assigned to operate them. The only way proficiency can be attained in their use is by constant and thorough drilling.

With regard to instruction and drilling of the crew, particular emphasis should be placed on that given the emergency squad. More advanced instructions should be given this group at special meetings. The size of the emergency squad will vary with the number of men in the crew, but in all cases should be composed of men with key ratings, such as the bos'n, carpenter, maintenance men, electricians, deck engineer, and other qualified ratings.

The balance of the crew should receive specific instructions regarding emergency duties while mustered during drills. The instructions on the Station Bill tell the crew member what to do when certain signals are given, and where to go. However, they do not necessarily say how these duties are to be performed. Some of the tasks may be simple, and require little explanation, but they all require cooperation and coordination. This is where instruction and drilling to make a well-organized unit show up. It is a simple matter to respond to a signal and to go to emergency stations as required. However, the efficiency with which the emergency duties are carried out will indicate how familiar each member of the crew is with his emergency duty set forth in the Station Bill.

It cannot be stressed too strongly that fire and boat drills be conducted as the regulations require "as if an actual emergency existed." In this connection it is essential that all the emergency equipment be tested and operated, including, of course, the clearing away and swinging out of lifeboats, where such is practical, at every drill. It is within the discretion of the Master to determine if weather conditions permit such action. It does, however, seem that entries in the Official Log Book concerning fire and boat drills to the effect that "weather conditions did not permit clearing away and swinging out lifeboat" appear too often. The valuable experience gained from actually working with lifeboats should not be denied the crew without sound reasons inasmuch as it may come in very handy at a future date.

The crew's responsibility goes beyond ascertaining the particular emergency station from the Station Bill and showing up there at a certain signal. For example, life jackets must be worn properly to all drills and every assigned duty must be carried out promptly and efficiently. For this reason every man and his equipment should be checked at emergency drills, and any defects noted should be corrected.

Special consideration should be given to the assignment of boat commanders. Only c o m p e t e n t men should be entrusted with the command or as second in command of lifeboats. A comprehensive knowledge of the boat problem is necessary so that under various circumstances a lifeboat may be launched successfully.

Hesitation and insufficient leadership are direct incentives to otherwise preventable casualties. This consideration demonstrates that the

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REGATTAS OR MARINE PARADES

From time to time complaints are received to the effect that various regattas and marine parades are interfered with by vessels not participating in the event. It is contended such vessels cross the course laid out for a boat race; anchor in the course of a regatta or marine parade; or pass this area at excessive speeds which jeopardize the safety of the participating vessels, and those on board.

Unfortunately, it is often true that complaints such as these are the first notice that the Coast Guard has that such a regatta or marine parade was held. This, of course, is in conflict with statutory regulations inasmuch as 33 CFR Part 100 clearly sets forth the procedure to be followed in seeking permission from the District Commander, U. S. Coast Guard, *before* a regatta or marine parade may be held.

Such regulations are not something new. They trace their origin back to statutes enacted at the turn of the century. Moreover, their prime purpose, to promote the safety of life on navigable waters during regattas or marine parades, has not changed.

Therefore, organizations planning to hold marine parades or regattas, which, by their nature, circumstance, or location will introduce extra or unusual hazards to the safety of life on navigable waters, must submit detailed plans of such marine regattas or marine parades to the Commander of the Coast Guard district in which it is planned to hold them. Any organized water event of limited duration which is conducted according to a prearranged schedule, and in which general public interest is manifested, is considered a "marine parade" or "marine regatta."

Since many factors must be considered in arranging for the proper supervision and notice to the public of a contemplated regatta or marine parade, requests for permission to hold snch affairs are required to be filed well in advance of the date of the event. If the planned regatta or marine parade is to be of such a nature as to involve limitations on the use of a portion of the navigable waters by other interested parties, detailed plans must be submitted at least 60 days prior to the event. In all other cases, not less than 15 days' notice is required.

In order that the District Commander may properly evaluate the request, certain detailed information must be furnished with the application to hold a marine parade or regatta. First, the name and address of the organization sponsoring the event, as well as the purpose for the affair, must be given. In this connection, the amount of general public interest in the event must be included, along with an estimate of the number and types of participating and spectator watercraft likely to be in the area at the time. A time schedule and description of the events to be held should also be included in the plans, along with a section of a chart or scale drawing showing the boundaries of the event and the various water courses or areas to be utilized by participants, officials, and spectator craft.

It may be wondered why so much advance notice and detail are required in these matters.

When there is a possibility that the movement of traffic over a certain portion of a navigable body of water may be suspended or restricted for a period of time, it is essential that serious and thorough consideration be given to such matters. The plans must also be studied to ascertain whether the proposed marine regatta or marine parade may be held in the designated navigable waters with safety to life. At times it is necessary to hold a public hearing on the matter to determine the views of all persons interested in, or who will be affected by, the proposed marine regatta or marine parade before a decision is given. Therefore, sufficient time must be allowed to consider all these points.

After carefully studying all factors involved in the submitted plans, the District Commander will either approve, disapprove, or suggest a certain change or changes in the interest of safety on the navigable waters before they are approved. If the plans are approved, special local regulations will probably accompany the approved plans. For example, if the plans concerned a series of races, the special regulations would prohibit movement of vessels, except participants, patrol craft, committee boats, etc., on race courses and adjacent waters for a specific period prior to, during, and after the races. Anchorage would be prohibited on the race courses, and where anchorage areas were established, anchors would be required to be placed well within the area so that no portion of the hull or rigging would extend outside the boundaries of the anchorage area. These are some regulations which may be applicable to most marine parades or regattas. They are by no means all-inclusive since conditions peculiar to each event must be considered when special regulations are formulated. However, every effort is made to make such regulations as specific as possible and at the same time to draw them up so as to cover every foreseeable situation.

When for various reasons it is necessary to deny approval of plans for a marine parade or regatta these reasons will be furnished at the time notice of disapproval is given. As

was mentioned above, such decisions are made only after sound consideration of all the factors involved, and it is unfortunate that at times it is necessary to refuse permission to hold regattas or marine parades on the navigable waters.

However, where the plans are approved it is essential that notices of such marine parades or regattas be given wide publicity well in advance of the event. The local radio, press, and Notices to Mariners are utilized for this purpose. Such advance publicity increases the effectiveness of the Patrol Commander during the actual event, inasmuch as all boat operators in the area are forewarned and know what is expected of them.

After approval of the plans for a marine parade or regatta, the District Commander takes the necessary steps to see that the area will be adequately patrolled, not only to see that the special local regulations are enforced, but also to render assistance where necessary and to enforce applicable general regulations. From time to time the Coast Guard Auxiliary is called upon to assist in these matters, and it does an excellent job. Where a private vessel is utilized by the Coast Guard to assist in this work, it is easily identified, as it displays the Coast Guard ensign.

In 1952, Part 100 of Title 33 CFR was amended by the addition of a new Section 100.30. By this amendment, 33 CFR Part 100 was made inapplicable to a marine parade or marine regatta occurring on the interior waters of a state, providing certain conditions were complied with. The new section sets forth these prerequisites and is quoted below:

"§ 100.30 *Permissible state regulation of marine regattas or marine parades.* (a) In the exercise of his discretion as provided in section 1 of the act of April 28, 1908, as amended (sec. 1, 35 Stat. 69, as amended; 46 U. S. C. 454), the Commandant has determined that the regulations in this part shall not be applicable to a marine regatta or a marine parade occurring on the interior waters of a state if:

(1) The state directs and controls the operation of such a marine regatta or marine parade in a manner such as to insure the safety of life on navigable waters during a marine regatta or marine parade; and,

(2) The state submits to the Commander of the Coast Guard district in which the marine regatta or marine parade is to occur its complete plans for regulation of such regatta or parade, such plans to be submitted at least two weeks before the occurrence of such regatta or parade.

(b) Upon the completion of his study of the plans and at least one week before the occurrence of a marine regatta or marine parade, the Commander of the Coast Guard district will notify the state which submitted the plans:

(1) That the plans are approved and the regulations in this part shall not be applicable to such regatta or parade; or,

(2) That the interest of safety of life on the navigable waters require specific change or changes in the plans before they can be approved; or,

(3) That the plans are not approved, with reasons for such disapproval, and that the regulations in this part are applicable to the marine regatta or marine parade.

(Sec. 1, 35 Stat. 69, as amended; 46 U. S. C. 454)"

Several penalties are provided for the violation of any regulations issued to promote the safety of life on navigable waters during regattas or marine parades. For example, 46 U. S. C. 454 and 457 read in part as follows:

Section 454: *Regulations as to Regattas or Marine Parades.* The Commandant of the Coast Guard is authorized and empowered in his discretion to issue from time to time regulations, not contrary to law, to promote the safety of life on navigable waters during regattas or marine parades.

Section 457. *Penalties for Violations of Regulations.* For any violation of regulations issued pursuant to the three preceding sections the following penalties shall be incurred:

(a) A licensed officer shall be liable to suspension or revocation of license.

(b) Any person in charge of the navigation of a vessel other than a licensed officer shall be liable to a penalty of $500.

(c) The owner of a vessel (including any corporate officer of a corporation owning the vessel) actually on board shall be liable to a penalty of $500, unless the violation of regulations shall have occurred without his knowledge.

(d) Any other person shall be liable to a penalty of $250.

Persons who operate a motorboat in a reckless or negligent manner are also subject to severe penalties as provided by the Motorboat Act of 1940. Where the operator of such a craft endangers the life, limb, or property of any person by interfering with a marine parade or regatta, or by violating the special local regulations laid down for such an event, he may be prosecuted under this Act. 46 U. S. C. 526m reads as follows:

Any person who shall operate any motorboat or any vessel in a reckless or negligent manner so as to endanger the life, limb, or property of any person shall be deemed guilty of a misdemeanor and on conviction thereof by any court of competent jurisdiction shall be punished by a fine not exceeding $2,000, or by imprisonment for a term of not exceeding one year, or by both such fine and imprisonment, at the discretion of the court. Apr. 25, 1940, C155, Sec. 14, 54 Stat. 166; U. S. C. Sec. 526m.

These statutes are not quoted or held out as threats to be invoked at the slightest infraction of the special local regulations for a particular marine parade or regatta. They are available, however, if infractions are serious enough to warrant resorting to them.

Cooperation with the special local regulations formulated for a particular marine parade or regatta is what is desired primarily by the Coast Guard. All these regulations have one purpose in mind—the promotion of safety of life on navigable waters during these events.

FALLS ON SHIPBOARD

Falls account for a large portion of the total number of personnel injuries on board merchant vessels. Their severity depends in part upon the location where they occur. However, all falls are potentially dangerous because of the presence of all types of machinery on board and the hazardous nature of much of the work performed on ships.

Falls on or from ladders probably comprise the greatest number of such injuries. These are not limited to those occurring on gangways, but also include those which occur in engine room spaces, hatches, and other parts of the vessel. Injuries received in this type of fall are usually very painful, often quite serious, and in some instances even fatal.

Falls from ladders generally involve falling from one level to another. Other types of similar falls involve those into hatches, over the side, or those from aloft. In falling any distance it is evident that the greater the distance of the fall, the more serious the resulting injury is likely to be.

Another class of falls found on vessels are those which occur on the same level, such as slips on the floor plates or decks. These also can be very serious when it is considered that moving machinery is constantly present, particularly in the engine room, and that any surface or protruding object likely to be encountered in falling would be composed of steel.

In attempting to cut down or eliminate these accidents, prevention is the keynote. Much can be done along these lines; however, it is not a one man job. It requires the cooperation and assistance of the entire crew.

Many falls, for example, just seem to happen—no cause is evident. This is particularly true of falls on or from ladders. When a crew member is asked why he fell down a ladder, he is often at a loss to explain it himself. Carelessness, preoccupation, or inattention can only be advanced as reasons for such falls. In descending or ascending ladders it is particularly important that full attention be given to just that. Every movement should be deliberate. Unsafe practices should be avoided, such as overloading oneself, and thereby having no means of holding on to handrails.

Handrails should be used and grasped in a proper manner. By keeping one hand above the body and one below when descending a ladder there is less chance of falling forward since the fall can easily be checked by tightening the grasp. In fact, the grasp on the handrail should not be released until the step from one rung to the other has been completed.

When facing straight forward with the hands relaxed at the sides, a person can fall quite a distance before the muscles can tighten up and check the fall. These can be among the nastiest falls encountered on board a ship, especially should the fall occur from a gangway with the resulting possibility of going overboard, or from a ladder leading to the engine room, where there is a possibility of going head first into machinery or onto the floor plates below.

Most falls do not just happen, however. Unfortunately, they are caused, and quite frequently such causes are the result of carelessness or even negligence. For example, any moisture, or, especially, petroleum products, on a steel deck or floor plate makes walking in this area extremely hazardous. For this reason any foreign material, oil, grease, etc., on deck should be cleaned up immediately.

If impossible to remove these substances immediately, anti-slip materials, such as sand, sawdust, etc., should be spread until the area can be cleaned up. When weather conditions make decks slippery because of icy or wet surfaces the same precautions should be exercised in walking in these areas.

Non-slipping, non-corrosive safety treads should be used around door coamings and at the foot of ladders. Where slipping is likely to occur because of wet decks, abrasive materials should be used to prevent falls.

Some falls on board ship can be attributed directly to faulty and unsafe equipment. Rope and tackle to be used aloft and in securing gangways, etc., should be inspected constantly and defective items replaced or repaired. This equipment must also be used in a safe manner. For example, there are many reports of accidents caused by improperly using equipment aloft, particularly the bos'n's chair, or by failing to use a safety belt.

Before a person is permitted to do such work, it should be ascertained whether he is thoroughly familiar with this equipment, and sufficient personnel should be assigned to handle the lines on deck. One seaman was seriously injured in attempting to lower himself from aloft when the line slipped through his hands and he was unable to check his fall.

Falls into holds and tanks of vessels are quite often fatal, and personnel should be ever vigilant to prevent them. There are various causes, most of them preventable, for this type of accident. For example, the use of broken, split, or ill-fitting hatch boards is only inviting disaster. For this reason, defective hatch boards should be discarded and replaced immediately.

Where hatch boards and fore and aft and athwartship beams are not interchangeable, they should be plainly marked to indicate the deck and hatch to which they belong and their position thereon.

Hatches should not be left as booby traps with tarpaulins drawn across such openings when there are no hatch boards underneath. When inclement weather comes up, hatch tents should be used to protect open hatches. When such hatches are not being worked, hatch covers should not be "spread", that is, only a certain number put in place, since openings between the covers may cause accidents. The hatch should be either covered properly or suitable guards, such as adequate life lines, rigged to prevent anyone falling into them.

One other point on hatch covers should be considered: they should always be stacked properly when removed from the hatches. Personnel should not have to climb over them to get around the decks, and they should not be stacked in such a manner as to fall on persons using the area.

The rungs on ladders leading into hatches should be inspected frequently, as they are subject to damage from cargo coming in and out of holds. Any defective rungs should be replaced, as fatal falls have resulted from personnel falling to the bottom of a hatch after stepping on a rung which carried away, or while reaching for a missing rung of a ladder.

Leaning too far over or standing on coamings of open hatches is another cause of falls into such areas. In fact, one seaman received painful injuries when he fell at an angle from the hatch coaming into the winch machinery. If a person falls either way he is subject to serious injury. The lesson to be learned from this is to stay off the hatch coamings.

When it is necessary to enter unlighted cargo compartments, proper portable lights should be furnished. In fact, proper lighting is essential throughout the vessel, particularly in work areas and passageways.

Passageways and ladders should also be kept clear, and materials should never be stored in or on them. Air hoses are a constant source of danger here.

Areas under ladders on board ves-

sels frequently become catch-alls for stray materials and supplies. This practice should be avoided also, inasmuch as anything protruding beyond a step may cause a fall and subsequent injury. Such was the case where the lip of a barrel stowed under a ladder on deck protruded between two rungs of the ladder, causing a seaman to fall and injure his back.

Falls in the engine room frequently result from poor housekeeping practices in this area. Objects left lying around on floor plates, ladders, and machinery frequently cause such accidents. Bolts, nuts, short pieces of pipe, tools and other similar objects often result in falls because they will turn underfoot when stepped on.

Floor plates should be kept in good repair, clean, and free of slippery surfaces. This at times may be quite a problem because of the amount of machinery and petroleum products used in the area. Every effort should be made to prevent drippings by repairing leaks or providing more efficient oiling devices. Drip pans should be used, if necessary, to keep oil and grease off the deck.

Unsafe practices in the use of large wrenches, bars, and other types of leverage tools often result in falls. Such accidents may result when persons fail to fit wrenches properly, fail to get a good "bite" in using a pry, or do not take a safe stance when undertaking such tasks.

For example, the tool may be placed so that force is exerted directly downward on the handle; in such a case, the worker cannot avoid falling if the tool slips. Or the angle of pull may be correct, but the man may stand with his feet together, instead of apart, so that he is not braced. Instructions should, therefore, be given in the correct use of tools in order to prevent accidents such as this.

If tools and necessary stores and equipment are kept in accessible storage places and are not left lying around, the number of falls in the engine room will decrease. The constant presence of moving machinery in this area increases the hazard of serious injury resulting from these falls. The distance may be short, but the risk is great.

The wearing of torn or loose clothing around the engine room increases the risk of injury. Such garments may get caught in moving machinery or on a projection of some rod, causing a fall or other injury. Frequently when falls occur in such areas, a person reaches out instinctively for something to grab. In so doing many an arm or hand has become entangled in moving machinery and has been severed. Proper wearing apparel will pay big dividends in protection from accidents.

While on the subject of wearing apparel, it should be noted that shoes with exposed nails in them increase the risk of slipping on wet deck. Rubber soles and heels are also treacherous on oily surfaces.

Reaching, or overreaching, to adjust valves, regulators, and lights, or to reach that extra six inches of painting surface should be avoided. Proper means should be used to reach the desired object instead of risking getting off balance and inviting a fall. Sufficient catwalks and gratings should be provided to get at inaccessible valves, etc., or else they should be moved to a more convenient location. The use of hand ladders or jury rigged ladders on board ship is treacherous because of the motion of the vessel, and they should never be used unless another person is present to hold them secure, or they are properly lashed down.

Falls often result from efforts to use short cuts. For example, instead of using the gangway, substitute means of getting ashore are used. Using cargo gear for this purpose or jumping from the bulwark to the dock is an extremely dangerous method. Every once in a while someone is foolish enough to attempt to enter a boat alongside or astern via a hand line and generally winds up falling in the water or to the deck of the boat.

Other short cuts which often result in falls are those taken across hatch tops, particularly at night, and those taken over deck loads instead of catwalks equipped with life lines. It is not a question of conjecture as to whether these actions produce injuries. It is a fact they *do*. There have been more than enough cases in the past to bear this out.

From the above it is quite evident that falls on board ship are one class of accident that can generally be prevented. Very few such injuries are inevitable.

Unfortunately, however, most preventive action is not taken until after a serious accident has occurred. The hazards are still there, but nothing is done about them.

Good housekeeping, frequent inspections, the remedying of defects uncovered, and the training of personnel in the safe usage of the proper tools and equipment on board ship before falls occur, *pay off*. Safety is not a matter of concern for the supervisory personnel alone, since for the most part it is the members of the crew who wind up with back injuries or fractured knees, heels, and rib bones as a result of falls of various sorts. All must cooperate in reporting and eliminating the causes of such accidents.

STATION BILLS

(Continued from page 123)

boat commander and the man attending the releasing gear have responsible tasks and that skilled cooperation is absolutely necessary. The lifeboat commander has charge of the entire operation and should be in the boat during the operation of lowering because he must decide the opportune moment for releasing the falls.

In port, lifeboats should be lowered and put out from the vessel and the crew instructed and drilled in rowing and sailing. Care must be taken to see that the same few boats are not the ones used over and over again.

Those crew members assigned to holding and tending painters should be instructed to take into consideration the draft of the vessel for the particular voyage so that when the boat is in the water and the painter is taking the strain, the boat fetches up abreast a boat ladder. Painters should also be held and tended at the ship's rail in such manner that they may be readily released from that position even if under severe strain.

On vessels carrying passengers it is essential that every effort should be made to have the passengers participate in the actual fire and boat drill. As a general rule passengers are interested in the subject and further interest can be stimulated. For example, one of the room steward's first duties after the passenger comes aboard should be to call the passenger's attention to the card in the room indicating the lifeboat station, emergency signals, etc. The officers can also outline to the passengers the reasons for holding emergency drills, and if possible a movie can be shown of an actual fire and boat drill in operation. With this knowledge the passenger will keenly await the first fire and boat drills and be anxious to participate.

The duties connected with the assisting and controlling of passengers are normally assigned to certain members of the steward's department. In emergencies they warn all passengers, assist them to obtain and put on life preservers, and direct them to assembly or embarkation stations. They also keep order in the stairways, passages, and doorways, and impress upon passengers the serious danger of injury from leaping overboard.

In this connection, the importance of using side ladders for the purposes of entering the boats, should it prove necessary to embark after the boats have been lowered into the water, should be pointed out. Passengers should also be particularly warned that the general alarm is not a signal to abandon ship, but is only intended to assemble them.

Of course, the entire crew should be instructed in the manner of assisting the passengers during emergencies, but inasmuch as the steward's department members are more directly connected with the passengers they should be particularly trained in this work. It is essential that all these emergency duties be carried out in an efficient and well-disciplined manner to instill confidence in the passengers and to prevent panic in case of an actual emergency.

It is possible to go on listing various duties to be carried out during emergency drills. However, inasmuch as the Master of each individual vessel must prepare his Station Bill to cover every type of emergency that may arise, the problem of proper Station Bills and emergency drills is peculiar to each vessel. Every emergency station must be manned by a competent and well trained crew member.

The use of Standard Station Bills lays the groundwork, by giving each seaman a set of fundamentals regarding emergency and abandon ship signals and instructions which are uniform throughout the merchant marine. From there it is up to the officers and men themselves to produce well-instructed, disciplined, and properly organized crews. Such crews spell the difference between success and failure in dealing with any emergency which may arise or for that matter in avoiding disaster should it be necessary to abandon ship.

Your Fact Forum

Q. Why should wire rope cargo falls, topping lifts for booms, and other wire rope gear be carefully lubricated periodically?

A. A wire rope is a machine with many moving parts. Each time a rope is bent or straightened, the wires in the strand and the strands in the rope slide on each other. This requires lubrication. Also, a film of oil or grease acts to prevent corrosion of the wire rope.

Q. What precautions are prescribed by Coast Guard regulations when connecting cargo hose between a ship and shore terminal, or other vessel?

A. Sufficient hose should be used to provide for the movement of the vessel. Gaskets should be used in every hose joint and in couplings to pipe lines. Where bolted flanged joints are used, a sufficient number of bolts should be used to secure a tight connection. Sufficient tackles should be used to support the hose and pans, or buckets should be placed under cargo hose connections on the vessel.

Q. How should hatch beam or pontoon slings be fitted for safety of the personnel handling them?

A. Slings and bridles used for handling beams and pontoons should be fitted with manila pennants so that personnel working with the beams or pontoons are not exposed to danger by handling the objects directly.

Q. What precautions should be taken before starting a steam windlass or winch which has been standing idle for some time?

A. Before a steam windlass or winch is started, all the condensate should be drained from the lines, cylinder, etc. The exhaust valve should be opened. The steam valve should be opened very slowly so that the engine may warm gradually and the remaining condensate blown out. Also piston rods, gears, connecting rods, and bearings should be lubricated if necessary.

Q. What precaution should be enforced when men are working with pneumatic or electric chipping hammers?

A. Men working with pneumatic or electric chipping hammers should wear goggles. Portable electric tools should also be grounded so that personnel are not subjected to hazard through a short circuit.

Q. What precaution is advisable when padeyes, cleats, lashings, or other fittings or objects are so located on the deck that personnel may trip or stumble over them in the dark?

A. The use of yellow paint to indicate stumbling hazards is used quite extensively. If yellow is unavailable, white or other light colored paint may be used. Where rope or wire lashings form an obstruction, strips of white or light colored rags tied to the lashings help to warn of the hazard.

Q. What is the purpose of the fresh waterline on the loadline markings?

A. The fresh waterline indicates the line to which a ship can be loaded in perfectly fresh water so that she will float on the corresponding salt waterline when she reaches the sea.

Q. How would you determine the applicable loadline for a port?

A. The applicable loadline for a port would be determined by locating the port on the seasonal loadline chart in the loadline regulations. To this the allowance for the density of fresh water at the port as determined from the loadline regulations or by use of a hydrometer would be added.

Q. A vessel's metacentric height has been computed to be 1 foot. Employing the empirical formula:

$$T=\frac{.44\ B}{\sqrt{G\ M}}$$

. . . where B is the vessel's beam of 40 feet and T is the vessel's full rolling period in seconds, estimate the vessel's full rolling period (starboard to port then back to starboard) when at sea.

A. $T=\frac{.44\times 40}{\sqrt{1}}=17.6$ seconds.

Q. Explain how reversing is accomplished on steam geared turbines and on turbo-electric drive vessels.

A. An astern element is installed in the low pressure end of the turbine, usually consisting of impulse blades. This runs in a vacuum when running ahead. When going astern, steam is shut off from the ahead element and opened to the astern element. On a cross-compound turbine, this astern element is usually placed at the low pressure end of the low pressure turbine. With turbo-electric elements the turbine engine runs in only one direction. The propeller is reversed by reducing the turbine speed to idling and changing two of the leads to the motor and then increasing turbine speed as required.

Side Lights on the Rules

In this, the eleventh article in the Side Lights on the Rules series, we shall continue with the comparison of the International Rules with the local rules to prevent collisions by turning to Rule 15, International Rules.

Since this rule is lengthy, this article will be limited to subsections (a) through (b), inclusive.

Subsection (a) prescribes certain sound devices in the following terms:

Rule 15 (a) A power-driven vessel shall be provided with an efficient whistle, sounded by steam or by some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient fog-horn, to be sounded by mechanical means, and also with an efficient bell. A sailing vessel of 20 tons or upwards shall be provided with a similar fog-horn and bell.

Aside from differences in terminology and the fact that the fog horn need not be sounded by mechanical means, similar provisions are to be found in Article 15, Inland Rules.

Rule 15, Western Rivers Rules, also contains similar provisions. Differences primarily consist of:

(1) Terminology.

(2) The fog horn does not have to be sounded by mechanical means.

(3) A sailing vessel of 20 gross tons or more is only required to have a bell.

Rule 14, Great Lakes Rules, on the other hand, merely requires steam vessels to be equipped with a whistle and a bell. The whistle must be placed before the funnel, at least 8 feet above the deck, or in such other place as determined by the Coast Guard. It must also be of such a character as to be heard in ordinary weather at a distance of at least 2 miles. In turn, the rule requires all sailing vessels to be equipped with an efficient fog horn and bell, even if under 20 gross tons.

These local rules are complicated by the fact that the Motorboat Act of April 25, 1940, is in part amendatory of these provisions.

Sections 4 and 5 of this Act state:

Sec. 4. Every motorboat of class 1, 2, or 3, shall be provided with an efficient whistle or other sound-producing mechanical appliance.

Sec. 5. Every motorboat of class 2 or 3 shall be provided with an efficient bell.

Under Section 17 of the Act these two sections have been implemented by regulations published as 33 CFR 25.10–10, 25.20–10:

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.

25.10–10 Motorboats operating on the navigable waters of the United States.

25.10–10 (a) Motorboats operating on the navigable waters of the United States shall be provided with an efficient whistle or other sound producing mechanical device as set forth in Table 25.10–10 (a), except:

25.10–10 (a) (1) Commercial fishing motorboats may carry any device specified in Table 25.10–10 (a).

25.10–10 (a) (2) Motorboats engaged in a race which has been previously arranged or announced, or while engaged in such navigation as is incidental to the tuning up of the motorboat and engines for the race, need not carry the devices required by Table 25.10–10 (a).

TABLE 25.10–10 (a)

Class of motorboat	Type of device
A	None.
1	Mouth, hand, or power operated, capable of producing a blast of 2 seconds or more duration, and audible for at least one-half mile.
2	Hand or power operated, capable of producing a blast of 2 seconds or more duration, and audible for a distance of at least 1 mile.
3	Power operated, capable of producing a blast of 2 seconds or more duration and audible for a distance of at least 1 mile.

25.20–10 *Motorboats operating on the navigable waters of the United States.*

25.20–10 (a) When operating on the navigable waters of the United States, motorboats of Classes A and 1 are not required to carry fog bells. However, motorboats of Classes 2 and 3 operating on the navigable waters of the United States shall be provided with an efficient fog bell, except:

25.20–10 (a) (1) Motorboats engaged in a race which has been previously arranged or announced, or while engaged in such navigation as is incidental to the tuning up of the motorboat and engines for the race, need not carry the fog bell required by this section.

If it is kept in mind what sound devices are not required by what vessels in turning to Subsection (b) of Rule 15, International Rules, and its equivalent local provisions, it will be noted that while certain vessels don't have to carry sound devices those same vessels must be prepared to sound the prescribed fog signals in restricted visibility.

Rule 15 (b), International Rules, states:

(b) All signals prescribed by this Rule for vessels under way shall be given:—

(i) by power-driven vessels on the whistle:

(ii) by sailing vessels on the fog-horn;

(iii) by vessels towed on the whistle or fog-horn.

Except that vessels towed must sound fog signals *only* on the fog-horn, Articles 15 (1) and (2), Inland Rules, are similar.

Rule 15, Western Rivers Rules, is similar to Article 15, Inland Rules, in that vessels towed are to sound their fog signals only on the fog horn. But, Section 95.21, Pilot Rules for the Western Rivers, also provides that a visual signal consisting of an amber colored light be given simultaneously and in conjunction with whistle signals, except in a few specific instances.

Rule 14, Great Lakes Rules, on the other hand, incorporates essentially the same equivalent provisions in the respective subsections prescribing specific fog signals. Differences to be noted are:

(1) A vessel in tow of another vessel must sound a signal on the bell.

(2) A steamer with a raft in tow must sound a screeching or Modoc whistle.

Just what signals must be given in a specific instance are set forth in Rule 15 (c), International Rules, and its equivalent provisions. These signals will be compared in the next article in this series. It should be kept in mind, however, that there are no statutory exemptions whereby fog signals may be omitted, even by motorboats or other small vessels that are not required to be equipped with the above stated sound devices.

OF LIGHTS AND MEN

Time was when an engineroom watch stander established himself on intimate terms with the plant by employing his sense of touch, his sense of smell, and a well-tuned ear. A hand laid lightly on a spring bearing gave a positive and highly personal indication of its operating temperature; a sensitive nose, busily screening the distinctive varieties of engineroom smells, was quick to identify the sharp scent of potential machinery trouble. Even the slightest hitch in the familiar rhythm of the main propulsion engine was detected instantly.

Not for him, then, were the impersonal warnings of a glittering bank of indicator lamps. His contact with the plant was immediate and personal.

Today, however, there is the constant danger that the major share of watch standing responsibility may be automatically assigned to the engine alarm system and the neatly grouped rows of distant-reading gages, and that a good percentage of the watch stander's 4 hours down below be spent staring at a veritable Christmas tree of multicolored lights and gages. The total effect of this display is often hypnotic, and it's doubtful that a watch stander thus afflicted would recognize any machinery casualty that was not first loudly announced by the screech of an alarm horn.

Basically, the engineroom alarm system offers nothing more than an extra margin of equipment protection. No matter how efficient the system, the responsibilities and routine duties of an engineroom watch stander remain unchanged. In short, the watch stander must still make his rounds, must still learn to develop and trust his own sensitivity to the peculiarities and shortcomings of the plant. No mechanical or electrical device now exists which can successfully take over the duties of a trained and conscientious watch stander. An engineroom alarm system will report the approach of a machinery failure, but a good watch stander will spot the first minor symptoms of an impending casualty and make the necessary repairs and adjustments before a breakdown occurs. Neglect the human element, rely solely on disinterested pressure and temperature switches, and you expose the plant to the dangerous lapses of attention which are an inherent part of any alarm system. A switch left open, a loose terminal connection, a broken lead—and the alarm system is inoperative.

On the credit side, of course, is the ability of the alarm system to command instant attention from even the most sluggish engineroom watch stander. In fact, the first startling blast of the alarm horn usually sets in motion a series of events that closely resembles the explosive action of the old Keystone comedies, though the engineroom log invariably carries calm accounting of this kind:

9:10 p. m. Port main engine lube-oil temperature alarm sounded off.

9:20 p. m. Cleaned port main lube-oil suction strainer. Temperature returning to normal.

Because most enginerooms are now equipped with alarm systems, and because these systems undeniably discourage the close relationship that should exist between plant and operator, it might be wise to review the few simple rules that apply to the use of these trouble-detecting devices.

Most watch standers are agreed that the unexpected blast of an alarm horn will rip through the normal engineroom noises with the shocking impact of a back alley scream at midnight. The initial reaction to the blast features, almost without exception, a strange combination of paralysis and violent movement. Mentally, the watch stander must push his way through the fog set up by perhaps several hours of routine duties performed under the dulling influence of the engines' steady beat. His physical response, however, is something else again. His reaction is swift and uncontrolled, and during the first few seconds he is liable to be stricken by something closely akin to panic.

The first simple rule, then, is this: Open the alarm horn switch. No longer nagged on by the frantic insistence of the horn, the watch stander is in a much better frame of mind. He's more likely to stop and think rather than sprint blindly to some remote corner of the engineroom.

Check the indicator lamps closely for the source of trouble. You'd be surprised at the number of watchstanders who dive below and secure the bypass valves on the port main engine lube-oil cooler when it's the starboard engine lube oil that's running too hot.

Walk—don't run—to the source of trouble. The very act of walking, rather than running, helps steady a man down in the face of emergency. By the time he's reached the trouble spot he's usually had enough time to make a preliminary diagnosis and line up several corrective measures. The alarm system warning is given well in advance of any actual casualty, and to launch into a problem in troubleshooting by racing across slippery floor plates makes for a poor—and sometimes painful—beginning.

In view of the current separation (and, finally, the inevitable divorce) of plant and watch stander, the only guarantee of proper plant supervision lies in an engineer using his head, his eyes, his hands, his ears and his sense of smell. Combine the applied talents of such a man with a well-designed alarm system and you'll really have something.

The major share of the watch standing responsibility cannot be assigned to the engineroom alarm system and the neatly grouped rows of distant-reading gages. Men—good men, that is—are still needed.

'TWEEN-DECK STOWAGE

Safety Report No. 12, quoting the recommendations of the Maritime Safety Code with respect to 'tween-deck stowage, and suggesting a procedure to eliminate the hazards created, was released in April 1953.

Since that report was released, the Safety Bureau has noted several conditions where "adequate walking space" was not maintained in 'tween decks. It has been reported to this Bureau, also, that a 'tween-deck condition recently was the cause of a labor dispute on board a vessel within the port of New York.

Because of the nature of stevedoring operations, it is impossible to observe a specific distance for the "adequate walking space" recommended. It should be clearly understood that section V, part B, paragraph 3, of the code does not imply that the beams and hatches removed from the lower deck have to be stowed in such compartments. This provision is meant to provide a safe walking area, and a safe place for men to stand while covers and beams are being removed.

The 'tween-deck conditions reported by field representatives have, in most cases, been the result of loading at other ports. However, instances have been reported where these conditions have been brought about at a pier within this port.

We wish to repeat the final paragraph of Safety Report No. 12:

> It is suggested that all ship operators advise their representatives, at this and other ports, to take the necessary action to assure that adequate walking space in the vicinity of 'tween-deck hatch openings is maintained when a vessel is scheduled to complete loading at this port. Voluntary correction of the above noted condition will avoid any possibility of this becoming an issue, leading to a demand for a required procedure.

—*New York Shipping Ass'n.*

LESSONS FROM CASUALTIES

PINPOINTED

A sleek modern cabin cruiser was completely shattered and destroyed by a gasoline vapor explosion this Spring when an examination of the boat failed to disclose one important factor—tightness of the fuel tanks. See figure 1.

This $30,000 beauty was utterly destroyed in the space of a few seconds. Fortunately, there was no one aboard at the time, and there were no deaths or injuries.

Early this Spring the man who served as the operator of the cruiser took her out of storage and prepared her for the forthcoming cruising season. He cleaned, varnished, painted, repaired, and overhauled everything he thought necessary, and on the afternoon before the fateful day the cruiser was in apparently beautiful shape. However, one disastrous flaw had been overlooked. There were several pinpoint holes in the gasoline fuel tanks.

The operator, after seeing that everything aboard was shipshape, threw the transfer power switch, so that the 110-volt shore power could be in use aboard the vessel, locked up the hatches, and departed. A 32-volt electrical system was installed on this cruiser and all electrical equipment operated on this voltage. The 110-volt wiring system was so installed that it could be cut into a shore power line, whenever available; the refrigerator compressor and battery charger were, in turn, so wired that they could operate on either the 32-volt or the 110-volt system. Before leaving the vessel the operator had opened the 32-volt master switch, so that the only electrical equipment aboard which was energized was the refrigerator compressor and the battery charger.

About 5:00 A. M. the next morning, without warning, a terrific blast aboard the cruiser shattered the hull, and the vessel sank at the dock, a constructive total loss. After the wreckage was raised, it was disclosed that the greatest force of the explosion had been in the gasoline fuel tank compartment and that the port and starboard sides of the vessel had been blown completely away from the deck and bottom planking in this area.

Both gasoline fuel tanks were recovered. Upon examination, they were found to be badly corroded, with numerous pin holes in the top and bottom of the tanks.

It is inconceivable how these leaks escaped detection, as the operator stated that he had cleaned and washed the engine room bilges only the previous day and had not noticed any gasoline in the bilges or any fumes in the engine room compartment. The wooden bulkhead between the fuel tank compartment and the engine room was not a tight bulkhead as there were limber holes at the lower boundary.

Beyond doubt, gasoline had leaked out of the defective fuel tanks during the period after the operator secured his vessel, and gasoline vapors accumulated in the interior of the cruiser during the night. Since there was no apparent source of ignition on board this vessel, other than the electrical equipment, it is quite apparent that the ignition of the gasoline-air mixture took place when one of the controls to the refrigerator compressor or the battery charger emitted an electrical spark.

As the cruiser was less than seven years old, it is difficult to see how properly constructed steel fuel tanks such as could be expected on an expensive cruiser of this type would deteriorate in this short period to the extent where gasoline would actually run out, but that is what apparently happened.

Any thorough examination of a gasoline powered motorboat must, in the interest of safety, include a positive check that the fuel tanks and fuel systems are tight, sound, and free of leaks. While it is often difficult to examine fuel tanks in their installed position, whenever there is the slightest doubt as to their tightness, they should be removed from the hull for a physical test to prove their soundness.

Such a test can be safely made using water pressure or air pressure.

With the air-pressure test, the tank must be closed tightly at all points except where the air hose is attached. Using a tight air hose connection and an accurate low-pressure air gauge, air pressure in the order of 5 p. s. i. in the case of gravity tanks or 10 p. s. i. in the case of pressure tanks is introduced into the tank. The air connection is then closed, and the gauge carefully watched. Any appreciable drop in the gauge reading within a period of 10 or 15 minutes will indicate leaks which should be repaired.

During the test period, a soapy solution should be applied to all portions of that tank. The use of a clean paint brush is an easy way to do this. Leakage will show up in the form of bubbles appearing in the soapy solution.

Using water pressure, the fuel tank should be closed at all points except for a connection on top of the tank

Figure 1

where a vertical pipe is tightly mounted. The tank is then filled with water through this pipe in such a manner that all air is excluded. After that, additional water is placed in the pipe. The column of water in the vertical pipe will apply a test pressure in the tank equivalent to about ½ p. s. i. per foot of height of water column. About 5 p. s. i. (10 feet of water column) for gravity tanks and 10 p. s. i. (20 feet of water column) for pressure tanks should be applied. Leaks in this type of test can be detected visually.

In any of these pressure tests there should be no permanent deformation or the tank is unsuitable for the use intended.

Pressure tests as described above can be made while the tanks are still installed in the boat, but the difficulties of making suitable connections, closing all other connections, and detecting any consequent leakage while in the installed position make such tests more difficult and more complicated than removing the tanks in the first place. Also, if any leaks are detected in the installed position, it is almost certain that the tanks will have to be removed from the boat so that proper repairs can be made. In passing, it should be mentioned that any motorboat fuel tank which requires repairs due to pitting, corrosion, or structural failure probably should be renewed, *not* repaired.

DANGEROUS—BEWARE LOOSE DOG!

A large modern diesel towing vessel was flooded and severely damaged last winter one one of the western rivers after she had struck a submerged object. However, there is a strong presumption that the damage was caused more by the failure to control the progressive flooding which resulted after the damage, than by the initial damage. Flooding took place through at least two "watertight" doors.

On a routine trip, a strong blow was suddenly felt from the bow of the vessel. Apparently a steel object of undetermined nature had been contacted. Flooding through a bottom plate near the starboard bow was immediately detected. The officers and crew immediately descended into the engineroom and noted water flowing aft into the machinery space through two "watertight" doors *which were open at the time*. They quickly closed these doors but, since the doors did not fit tightly, a large quantity of water continued to flow into the engineroom. Flooding progressed aft and the vessel was soon in a sinking condition. The captain headed his vessel for shore and beached her on a nearby mud bank. However, flooding continued and the stern sank in 17 feet of water. The two watertight doors at the after end of the engineroom were not closed. Consequently, the entire after part of the tug was submerged and flooded and extensive damage occurred to all of the machinery. Damage was estimated at over $100,000.

It was most unfortunate for this vessel that the four watertight doors were not only not in good operating condition, but opened the wrong way, that is, into the engineroom, and were not properly used. Although the vessel was salvaged and completely restored and there were no deaths or injuries, this mishap could have resulted in the complete loss of the vessel and loss of life.

While the above vessel was not required to be inspected, it is quite likely that fault could be found with the condition and use made of watertight doors and hatches on many other vessels, both inspected and uninspected.

Many types of watertight doors and hatches are found on the various types of vessels in the U. S. Merchant Marine. The characteristics, care, and use of mechanically operated watertight doors which are required to be installed on passenger and certain other types of vessels is a subject in itself. But, there are a number of points to be kept in mind concerning all other types of watertight doors and hatches which may be found on other vessels.

The most important point to be remembered and acted upon is that watertight doors are installed for a specific purpose and should be kept in condition to be used for that purpose at all times. Any factor which compromises the ability of a watertight door to close a bulkhead tightly and prevent flooding is a factor which endangers the ship, no matter what the reason for the compromising factor. Rendering a watertight door or hatch inoperative by lashing it open, obstructing its closure in any way, altering it materially so that it cannot function, or removing it should not be resorted to. Any condition which temporarily affects the full usefulness of a watertight door should be remedied just as quickly as possible. The moment of greatest need may arrive sooner than you think.

Hand-operated watertight doors and hatches found on merchant vessels of the United States are usually 1 of 2 types. The type must usually found is completely manual, that is, after the door is closed, the dogs have to be closed by hand or the door is useless. The number of dogs with which such doors are equipped will vary from 1 to 6. Such a door with less than six dogs is far from being an efficient watertight door. The second type of hand-operated watertight door found on merchant vessels is somewhat automatic, that is, the action of the dogs depends upon the manual turning of a handwheel. In these so-called quick-acting watertight doors, the turning of the handwheel which is mounted on both sides of the door on a common shaft actuates all the dogs simultaneously by means of gears and eccentric levers.

Watertight doors of either of the above types are useless unless they close tightly and true against the rim of the door frame. A properly designed WT door is so constructed that a continuous rubber gasket around its outer perimeter will come flush against a steel knife-edge built into the frame of the door in such a manner that this knife-edge presses tightly into the gasket and forms a seal entirely around the door. Therefore, it is necessary to keep all knife-edges clean, sharp, and true. They should not be painted and any damage must be repaired, to return them to true. The rubber gaskets must be complete, that is, full length, and kept free of paint so that the rubber will remain soft and pliable. Rubber gaskets on WT doors and airports are a favorite object to be painted by inexperienced painters, perhaps because such painters find these gaskets unpainted. Once such a gasket has been painted, it is usually necessary to renew it, as paint will harden and deteriorate the rubber.

Steel wedges against which the dogs tighten when they are closed have a tendency to wear, so that the door can no longer be made tight. In this case it may be necessary to build up and remachine the surface of the wedges or renew them. The dogs themselves require occasional cleaning or adjustment so that they operate freely and are positioned to engage the wedges properly. This adjustment can usually be made by using different size shims and washers. Many a WT door has been found to be "out of service" due to frozen dogs.

It is most important that the WT door itself be kept true and in one plane so that all of the outer surface will engage the knife-edge as it was intended to do. Constant usage of certain WT doors, damage due to heavy weather, blows struck by machinery or other objects, and the working of the vessel may cause WT doors to become warped and untrue. Unless repaired and trued up, these doors are useless for their primary purpose. Sometimes workmen or other misguided individuals cut holes

through WT doors for strange and various reasons. The repair and permanent closure of any such holes is essential, and it is almost always too late to do this after the vessel has been damaged.

On any well-run vessel which is equipped with WT doors or hatches, these closure devices should be tested regularly to see that they function properly, and any repairs which are needed should be promptly accomplished. It should never be forgotten that a fault in such a WT closure may be just as drastic to the safety of the ship as a hole in the underwater portion of the hull. A periodic test of such closures is particularly important if such closures are not used regularly; for instance, WT doors to storerooms or little-used compartments which may remain closed most of the time.

On WT doors of the quick-acting type, the actuating mechanism should be disassembled and inspected occasionally to insure that all of the parts are intact and working properly. Lubrication of the working parts at this time is highly desirable. On doors of this type, which are spring-loaded to automatically close, the spring should be closely examined to make sure it is completely operative. The actuating mechanism on this type of door should never be forced open or forced closed. If it does not work easily, undue force may easily break the gears or levers inside the door and this closure is then "out of service" until repaired.

Of vital importance is the general principle that WT doors are installed in a vessel to be *used*. In general, unless it is obviously necessary to keep such a door open for some specific purpose, the door should be kept closed, so that it will not be necessary for someone to remember to close it after damage occurs. Lives have been lost due to failure to observe this principle. Lashing WT doors and hatches open for convenience, or simply because the need of the tight closure is not staring in your face, is about the same as leaving fire extinguishers and life preservers on the dock when getting underway because you do not expect to have a fire or a man overboard on that trip.

In general, WT doors and hatches are mounted so that the water pressure resulting from flooding after the most likely type of damage will help close the door. The great majority of collisions and groundings which cause flooding usually involve damage near the bow or stern. In the case of the above-mentioned towing vessel, the WT doors should have been mounted so that they opened away from the engineroom, that is, so that flooding from the bow or the stern which progressed toward the heart, or engineroom, of the vessel would help close the doors, *not* help open the doors. However, this principle of the direction in which a WT door should open is subject to considerations of other local conditions which may necessitate opening the door in the other direction, such as lack of room for the door to swing, obstruction by some important object such as a fire hydrant, etc. In addition, consideration must always be takeu of the desirability of doors opening in the normal direction of *escape* for personnel.

A point of advice to be remembered in case of flooding which has been confined by a WT door—if you are uncertain whether a compartment behind a WT door is flooded and you are attempting to determine this by partially opening the door, don't try loosening the dogs on the edge away from the hinges. If you do, and there is full pressure behind the door, this pressure may burst open the door and you have lost control of the flooding. Try one of the dogs on the hinged edge. In this manner leakage will tell you if the compartment is flooded and you will *not* lose control and possibly flood another compartment, perhaps with the loss of the ship.

One common method of completely disabling a WT door which practically every vessel will encounter at some time or other is the habit of leading cables, air hoses, etc., through opened WT doors. This is usually done by shore workmen who have no appreciation of the importance of the door, and may care even less. If at all possible, do not disable your WT closures in this manner, as the only measures which can be taken in an emergency to close a door thus disabled, that is, cutting the cables and hose, etc., may lead to many unfortunate complications, and such a procedure may take too long to prevent flooding.

CHOCOLATE BROWN

A tragic and unnecessary loss of two lives by drowning occurred this Spring in the waters of Long Island Sound. Failure to utilize life preservers, failure to secure an anchor in the boat so that it would not fall out, and the apparent failure to exercise any foresight in measures to be taken in case of emergency all contributed to this casualty.

Each Spring and Summer for the past few seasons, there has been an alarming increase in the number of deaths from casualties due to irresponsible, careless, and negligent operation of outboard motorboats in the United States. Ominously, reports being received by the Coast Guard indicate that this year will be no exception; indeed loss of life in the above category may well be larger than ever before.

A party of 4 persons consisting of 2 men, the 14-year-old son of 1 of them, and the wife of the other set out early 1 morning in a 14 foot outboard-motor boat which they had rented from a boat livery. Although it had been raining with winds in gusts up to 31 knots when the woman in the party called the Weather Bureau that morning, clearing weather had been predicted. Unfortunately, at the time of the disaster, about noontime, the weather was still unfavorable for small boat operations, with gusts up to 28 knots.

The boat was equipped with 2 oars, a 12 pound mushroom anchor secured to the bow with 7 fathoms of line, and a bailing can. The party furnished their own fishing gear, a 7½ horsepower outboard motor, and 4 approved buoyant cushions. Paint on the bottom of the boat was a chocolate colored copper bottom paint. All members of the party were clothed in heavy garments for cold, rough weather.

After proceeding about 5 miles out into the sound, they anchored and fished for awhile. Surface conditions were severe with a strong chop, and spray was taken aboard. The men therefore decided that they should head for a more sheltered location.

Soon after getting underway, the boat started to ship water as the seas were building up. They headed for the nearest shore, intending to beach the boat and get rid of the water. Within minutes, however, more water came aboard and the boat swamped.

As the occupants floated clear, the boat rose to the surface but capsized. Due to the rough seas and turbulent conditions, the immersed persons could not hang on to the buoyant cushions, and all of them experienced great difficulty in keeping themselves afloat due to their heavy awkward clothing.

One of the men who was wearing hip boots went down very shortly, and the other man went down soon afterward. The woman and boy managed to cling to the keel of the capsized boat, which projected above the water only a few inches, for about 3½ hours before being picked up. During this time they were unobserved, although at least two searching helicopters passed overhead. The visibility of the chocolate colored bottom paint in rough water was obviously very low.

Upon capsizing, the anchor dropped to the bottom and prevented the boat from drifting. This most unfortunate circumstance probably contributed to the prolonged distress of the survivors, as the boat would undoubtedly have drifted ashore in this case

very soon, if it had not been for the anchor holding. Another factor which contributed to the loss of life was the heavy clothing which dragged the two men downward. Even for persons who have had training under the American Red Cross or other life-saving programs in the divesting of garments in the water, the removal of such heavy clothing would have been difficult. For persons who have never undergone such training, the safe removal of heavy clothing, especially in such turbulent waters and under the stress of panic or fear, is nearly impossible. Again, if the small boat had been stopped and bailed out after taking the first water aboard upon getting underway, this tragedy might have been avoided.

Certain general recommendations for greater safety of life on the water can be made on the basis of the facts in this case, and many other similar cases. This dramatic catastrophe could reoccur just as suddenly to any of thousands of outboard motor boat parties. These recommendations follow:

1. At the first indication of difficulty, don life jackets or buoyant cushions. (The latter would be secured to the wearer by light line, if practicable, or held close at hand.)

2. After taking water over the side or bow, anchor, drift or go with the sea, depending on the boat and circumstances, until the boat is bailed out. Then, proceed cautiously.

3. If heavy clothing is worn, make sure it is easily divestible.

4. Do not use small boats when weather conditions make the operation of such boats hazardous. (Boat livery operators could assist in this respect by refusing to rent small boats in periods of adverse weather.)

5. For all boats not decked over, the installation of a life line around the gunwale, or grabrails on the sides, may contribute vitally to the saving of life in an emergency.

6. The use of international orange paint or other bright-colored paint on the bottom of outboard-motor boats would assist greatly in the sighting of capsized boats by searching aircraft and surface craft.

7. The carrying of waterproof flashlights on lanyards, police-type whistles, orange flags secured to gunwales for easy access, or some other simple signal equipment would represent foresightedness and wisdom by anyone cruising in an outboard-motor boat.

8. Anchor lines should be secured in such a manner that they can be slipped, if desired, after a boat has capsized.

9. Full use should be made of local Weather Bureau facilities for latest weather reports and forecasts before boating expeditions are undertaken.

10. Operators of boat liveries should set operating limits as to waters, when renting boats, due consideration being given to the type of boat, weather conditions, and the number and nature of the persons who are to use the boats.

FIGURE 2 illustrates two typical approved jacket-type life preservers. Each approved jacket-type preserver must be stamped ADULT or CHILD, as the case may be, and in addition with the Model No., Manufacturer's Name and Address, Coast Guard approval number, *and* that it has been PASSED by the inspector.

LIFE IN THE BALANCE

"It was the Fourth of July. We were going up the river. The deckhand came up to the pilothouse where I was, and I asked him to go get us a cup of coffee. He went after the coffee, and we drank it in the pilothouse. He said: 'You know a lot of people are going to lose their life today in traffic accidents and drownings.' Then, he went down below. A few minutes later he was dead. Drowned in the river. And, those other three, too."

Thus, began the story of the disaster which struck a family of four on that sunny holiday morning on the Ohio River, as the Captain of the river towboat gave his statement at the investigation.

The young couple and their 10-year old girl and 8-year old boy had set out across the river, to pay a holiday visit to the grandparents who lived on the opposite side, in a small open boat with an outboard motor attached. When their course crossed astern of a river towboat pushing a barge upstream, the father, who was operating the outboard, turned the little boat to meet the wake wave head-on. But, the boat took a violent roll, and the mother and boy were thrown into the water.

There were no life preservers on board!

The father stopped the motor and leaped into the river to try to save his wife and child, leaving the little girl alone in the boat. The boy could not swim, and, in trying to hold him, the mother quickly became exhausted. Both went under. The father a fair swimmer, tried to reach both woman and child, but he became confused and exhausted. He also went under.

The Captain of the towboat had looked back just as the father jumped overboard. He immediately backed his engine and attempted to swing the tow around to a position where he could render assistance. The deckhand, hearing the engine backing, ran to the pilothouse to see what the matter was. As he caught sight of the people struggling in the water, he climbed over the rail, ignored the shouted warning of the Captain to get a life preserver, and jumped overboard without one. As quickly as he

could, the Captain threw life preservers into the river toward the sinking group, but none were near enough to be grasped by the drowning.

The deckhand disappeared below the surface before he reached the struggling group. Shortly all four were drowned.

Who can say what thoughts or wild impulses flashed through the mind of the little girl still sitting safely in the boat, speechless with horror? Divine guidance must have kept her rooted to the seat, and her life was spared.

Within minutes it was all over. Four deaths. One small family all but wiped out. One small girl with catastrophe forever engraved on her young mind. How easily these lives might have been saved if the boat had been equipped, as required by law, with life preservers (see figure 2), or if the deckhand had only waited long enough to don one before jumping. Casualty records at Coast Guard Headquarters bulge with hundreds of cases of river, lake, and seashore drownings where life preservers were not on hand or were not used when they should have been. Rare indeed is the report of anyone drowning in these waters who was wearing a life preserver.

APPENDIX

ACCEPTABLE COVERED STEEL ARC WELDING ELECTRODES

The following are additions to the list of electrodes which are acceptable to the United States Coast Guard for use in welded fabrication.

Distributor's and/or manufacturer's	Brand	AWS class	Operating positions and electrode sizes (inch)				
			5/32 and below	3/16	7/32	1/4	5/16
Harnischfeger Corp., 4400 West National Ave., Milwaukee 14, Wis.	DH-5 (contact)	E6012	2	2	2	2	
	DH-6 (contact)	E6020	2	2	2	2	
Smith Corp., A. O., Milwaukee (1) Wis.	SW-45	E6020	2	2	2	2	

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 June 25, 1954 (CGFR 54–23). Copies of these documents may be obtained from the Superintendent of Documents, Washington 25, D. C.

It will be noted that:

(a) All the approvals listed in this document which extend these approvals previously published in the Federal Register are prescribed and shall be in effect for a period of five years from their respective dates as indicated at the end of each approval, unless sooner canceled or suspended by proper authority; and

(b) All the other approvals listed in this document (which are not covered by paragraph (a) above) are prescribed and shall be in effect for a period of five years from the date of publication of this document in the Federal Register unless sooner canceled or suspended by proper authority; and

(c) The Document CGFR 54–14 appearing in the Federal Register dated March 25, 1954 (19 F. R. 1614–1619), and the Document CGFR 54–18 appearing in the Federal Register dated May 12, 1954 (19 F. R. 2739–2743), regarding approval of equipment, shall be corrected as indicated.

ARTICLES OF SHIPS' STORES AND SUPPLIES

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

Lamco Chemical Co., 33 Commercial Wharf, Boston 10, Mass. Certificate No. 156, dated June 11, 1954, "Lamco #22 Wax."

Lamco Chemical Co., 33 Commercial Wharf, Boston 10, Mass. Certificate No. 161, dated June 11, 1954, "Lamco #22 Safety Wax."

Lamco Chemical Co., 33 Commercial Wharf, Boston 10, Mass. Certificate No. 162, dated June 11, 1954, "Lamco Superior XX Light Wax."

Lamco Chemical Co., 33 Commercial Wharf, Boston 10, Mass. Certificate No. 163, dated June 11, 1954, "Lamco DeLuxe Safety Wax."

Lamco Chemical Co., 33 Commercial Wharf, Boston 10, Mass. Certificate No. 169, dated June 11, 1954, "Lamco Wax and Dirt Remover."

Lamco Chemical Co., 33 Commercial Wharf, Boston 10, Mass. Certificate No. 170, dated June 11, 1954, "Lamco Wax Soap."

AFFIDAVITS

The following affidavits were accepted during the period from 15 May to 15 June 1954:

The American Rubber Mfg. Co.,[1] 1145 Park Ave., Oakland 8, Calif., Fittings.

McNab Incorporated, 225 Lafayette St., New York 12, N. Y., Valves.

[1] Affidavit covers rubber expansion joints only limited to Class II piping and a maximum temperature of 200° F.

KEEP ON KEEPIN' ON

If the day looks kinder gloomy
and your chances kinder slim,
and the situation's puzzlin'
and the prospect awful grim,
and perplexities keep a-pressin'
till all hope is nearly gone—
Just bristle up and grit your teeth
and keep on keepin' on.

Fumin' never wins a fight
and frettin' never pays;
There ain't no good in broodin' in
those pessimistic ways;
Smile just kinder cheerfully
when hope is nearly gone,
and bristle up and grit your teeth
and keep on keepin' on.

There ain't no use in growlin'
and grumblin' all the time,
when music's ringin' everywhere
and everything's in rhyme;
Just keep on smilin' cheerfully
if hope is nearly gone,
and bristle up and grit your teeth
and keep on keepin' on.

U. S. GOVERNMENT PRINTING OFFICE: 1954