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The
Merchant Marine Council
of the United States
Coast Guard

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NOTE.—*The "Proceedings" has reprinted herein papers written by Captain George M. Wauhope, Executive Vice President, Farrell Lines, Inc.; Mr. J. D. Rogers, Vice President, Esso Shipping Company; Mr. John L. Horton, Marine Superintendent, Cleveland-Cliffs Iron Co.; and Mr. A. L. Mechling, Barge Lines, Inc.; which were presented at the 38th Annual Safety Congress and Exposition, Marine Section, National Safety Council in Chicago, Illinois, on October 17, 18 and 19, 1950.*

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COUNCIL ACTIVITIES

The Merchant Marine Council held a special meeting on November 27 to December 1, 1950, at U. S. Coast Guard Headquarters, Washington, D. C. Public hearings were held on November 27 and 28 for the purpose of receiving comments on proposed regulations regarding security of vessels and waterfront facilities which had been previously announced in the Federal Register of November 9, 1950. In addition to the members of the Merchant Marine Council on duty at Coast Guard Headquarters, the following officers from Coast Guard Districts sat as members of the Merchant Marine Council: Rear Admiral J. E. Stika, USCG, Commander, Twelfth Coast Guard District, San Francisco, Calif.; Rear Admiral L. B. Olson, USCG, Commander, Third Coast Guard District, New York, N. Y.; Captain J. A. Kerrins, USCG, Marine Inspection Officer, Fifth Coast Guard District, Norfolk, Va.; Mr. J. F. Oettl, Marine Inspection Officer, Eighth Coast Guard District, New Orleans, La.; and Mr. E. Stuart, Marine Inspection Officer, Eleventh Coast Guard District, Long Beach, Calif.

The Merchant Marine Council considered all the comments and recommendations submitted and recommended to the Commandant that the proposed regulations as published in the Federal Register of November 9, 1950, be adopted with certain changes. These regulations provide a security check and clearance of seamen and certain longshoremen and others normally working on merchant vessels and waterfront facilities. The regulations for security of waterfront facilities will be invoked at such ports as the Commandant may from time to time direct.

Know
Practice **SAFETY**
Teach

OUR EXPERIENCE IN SETTING UP A SAFETY PROGRAM FOR A STEAMSHIP COMPANY

by

Captain George M. Wauchope, Executive Vice President
Farrell Lines, Inc., New York

I was originally asked to talk upon a different subject, one that concerned unusual accidents on our vessels. However, since Farrell Lines has had a safety program in operation for only 1 year, I felt that we were hardly in a position to distinguish between usual and unusual accidents as yet; so, with the permission of your chairman, I have changed my subject to one that I am more familiar with. It concerns our experience in setting up a safety program.

As a background for some of the remarks that follow, perhaps I should tell you that Farrell Lines, which I represent, owns and operates a fleet of 16 ships—8 C–2's, 6 C–3's, and 2 combination passenger and cargo ships. These last are converted C–3's with first-class accommodation for 82 passengers. We operate two services from Atlantic coast ports, one to south and east Africa and the other to west Africa.

As is probably true with most of you gentlemen here, we found that our personal-injury claims had maintained a steady uptrend since the end of the war. Letters to, and discussions with our masters did not result in any improvement. Then it occurred to us that our safety problems were, in effect, divided into 16 parts (1 for each ship) and scattered over the seven seas—there to be forgotten among the hundreds of other problems a shipmaster has to contend with. So we decided to bring them all into our office for coordinated and top-level treatment. This has since proved to be a wise decision.

We chose as our safety director, to head our safety program, one of our older and more experienced masters, who also happened to have had legal training. Oddly enough, he was as skeptical as any in the fleet as to the importance and workability of a safety program. Nevertheless, he took the job and promised to do his best.

His first job was to draw up a set of safety instructions for our fleet. In doing so he drew heavily on the excellent ideas covering shipboard safety found in Captain Holden's various writings on the subject, as well as his (i. e., our safety director's) personal knowledge of the peculiar problems encountered on the coasts of Africa which we serve. These instructions were mimeographed, put in loose-leaf binders (which permitted ease in making any changes that might later be found necessary), and four copies were supplied to each ship—one for the master and each department head. The usual provisions were made for holding monthly safety-committee meetings on board, the keeping of committee meetings minutes, detailed accident reports, etc.

Our safety director was given an executive status in our company and, though his work is primarily advisory in nature, he has direct access to all shore department heads, with the further right of appeal to the executive vice president—in case of need—for securing compliance with all safety rules, the securing of safety equipment, etc. Technically he operates under the marine superintendent—since most of his work concerns the marine department—but actually he has a roving commission to poke his nose into any department whose operations may have a bearing on ship or pier safety. Such an ill-defined field of operations could easily lead to interdepartmental friction, but thus far none has developed. This we ascribe to a well-developed sense of tact (and such a qualification is a prime necessity for any safety director, we think) plus the fact that his work concerns human and company welfare, rather than discipline or even criticism. It's a case of "wouldn't it be better if we did thus and so?" rather than, "hey, you are doing that all wrong!" That, we think, is the real key to success in safety work. It fosters cooperation instead of antagonism.

The reaction of our fleet to the safety program was varied. A few masters took it to their hearts with enthusiasm, but most of them regarded it as a silly fad, and a few came very close to ignoring it. I personally read the safety committee meeting minutes of each ship (I still do) and took immediate steps to impress upon all recalcitrant masters that, silly or not, the safety program was definitely not a fad, and that their very jobs depended on their effectiveness in carrying it out, including all its procedural details. This brought results and acted to establish the prestige of the safety department on a firm foundation. Since then we have had no difficulty with compliance—only a difference in the effectiveness of the leadership provided by our masters. And, quite contrary to our original expectations, we have found that our older and more experienced masters have proven more adaptable in taking this new hurdle in their stride than the younger men. We suspect that this is because the old-timers have greater reserves of resourcefulness—a quality that goes hand in hand with long sea experience.

Getting a program started is one thing, while keeping interest alive in it is another. After a voyage or two, we found the safety committee meeting minutes getting shorter and shorter. It was quite evident that even the most enthusiastic committee felt that all safety "bugs" on their ships had been ironed out and there was little else to do but hold a formal meeting each month and adopt a resolution that everything was under control. Occasionally an unexpected accident would shock them out of their lethargy, but they would label this "regrettable but unavoidable" and quickly lapse back into their self-satisfied attitude again.

The answer to this was found by publishing our "Safety News." This is a modest four or five page mimeographed monthly publication. Our safety director got the idea for it by reading a copy of the excellent "Safety Bulletin" put out by the marine department of the Standard Oil Co. of California. He liked the style of it, the variety of technical information it contained, and the clever manner in which it discussed accidents and put over its own safety suggestions. He frankly adopted it as a pattern to follow and has been quite shameless in pilfering material out of it and other safety publications from time to time on the theory that plagiarism is a virtue rather than a sin when life and limb are at stake.

"Safety News" became popular with the fleet immediately. It pointed out accidents—serious and humorous—that had happened in our own fleet. It gave selected quotations from safety meeting minutes of different ships showing how they handled some specific safety problem, and it presented new topics for discussion at safety committee meetings. Since its publication, interest in safety aboard our ships, as evidenced both by the increased variety of subjects brought up in the safety committee meetings, as well as the lowered accident rate, has improved a great deal. In short, our little "Safety News" has proved itself a convenient medium for the dissemination of safety information and suggestions, as well as an excellent means of arousing and keeping alive the interest of all concerned in the safety program as a whole. We regard it as a vital part of our program.

More recently we have been mailing our Safety News out to the indus-

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try—a move that seems to have met with such general approval that we intend to continue this policy. We try to make our safety publication as readable as possible, but we hold no brief for its format or editorial qualities. Its primary purpose is to give publicity to unseamanlike practices and ignorant and foolish mistakes that let down the bars to the occurrence of accidents. Frankly, we wish more steamship companies would issue safety publications. By pooling our safety experience through an interchange of such publications we think a substantial advance could be made in accident control. Excellent work along these lines is being done by the Coast Guard, the marine section of the National Safety Council, the Pacific Maritime Association, and others, I know, but—except for some of the oil companies, who have pioneered this move—the steamship industry as a whole has been a bit backward, I fear, and much remains to be done in this particular field.

To illustrate the great importance of interchanging safety information, I need only point out that when our safety director first took over his duties, he—an old seaman, mind you—was a complete unbeliever in the possibility of danger from oxygen deficiency in covered tanks. He had read of such dangers, but his own (lucky) experience with long-closed peak tanks had disproved the "theory" to him. And it was not till he had read of several actual deaths from this cause in the Coast Guard proceedings that he changed his mind. Thereafter, he brought this matter to the attention of our fleet, and their reaction, as shown in the safety meeting minutes of our various ships, was convincing evidence of the surprising general lack of knowledge about this most important safety fact.

One more illustration: Quite recently—a couple of months ago—the safety director of one of our competitors called our safety director on the phone and told him of a danger inherent on many C type ships. I won't go into the particular danger as it is rather involved and will no doubt be brought up here anyway—it concerns a mooring line catching under the lip of the cap on a set of bitts, which resulted in a death. The receipt of this information, however, caused our safety director to issue special instructions to our ships concerning this danger. Due to the thoughtfulness of this competitor's safety director, a life may be saved on one of our ships. That is what I mean by the great importance of interchanging safety information. It would be a definite step forward in safety if we could all do so. I think we could if all of us would issue a safety publication. And I repeat—for those who think they lack the ability to write—that it is your knowledge of safety that will benefit us, not your knowledge of grammar, spelling, or phrase making.

We have also found, of course, that statistics are valuable in convincing ourselves, as well as our personnel, that our safety program is worth while. This is done by having our pursers fill out an accident abstract form each voyage listing the vital details of each reported accident. At first we followed the safety council's method of figuring accident frequencies by the lost time accident formula given. However, after six ships came in with no lost-time accidents and a zero frequency, we felt it unfair to hold them up as examples of perfection to the others for several reasons. One of them is that a seaman's full wages go on whether he is on the sick list or not. This results in many cases of "lazy man's lost time" accidents, and the accident frequency rates obtained thereby do not, we think, give a true picture of the safety control being exercised on one ship as compared with another. A still more important reason is that the difference between a minor injury and a true lost-time injury is often merely a matter of luck rather than good safety control. A man may slip on a carelessly produced oil spot and break a leg—or perhaps suffer only minor contusions. The extent of the injury (i. e. whether "lost time" or not) is a matter of luck and bears no relation to the lack of safety involved.

Consequently, we include as "accidents" all injuries requiring medical attention of any kind that could possibly result in a legitimate claim against the ship. Thus "iodine" or "liniment" injuries—whether or not they result in lost time—are considered as "accidents." We do not include accidents which occur during shore leave and we except certain injuries occurring aboard (e. g. personal fights) for which the ship is not responsible. These we except, not because of our lack of financial responsibility, but primarily because we feel that there is little we can do to eliminate them. Accidents to passengers, visitors, and other noncrew categories are not counted in compiling our records, though we keep a record of them for informational purposes.

Our safety director has worked out a "safety efficiency" rating formula of his own which we now employ instead of the safety council formula. Briefly, it is based on arbitrarily calling 2 accidents per man per year a zero efficiency rating. A 100-percent rating is attained by having no accidents at all. Thus a 50-man crew on a C-type ship would have to have 100 accidents in a year to rate zero. For a shorter period of time—a voyage, for instance—the number will be proportionately less. The formula is

$$\frac{\text{No. of accidents}}{\frac{100\text{—Man Days} \times 2}{365}} = \text{safety efficiency rating (percent)}.$$

Our reason for adopting this system was twofold: First, because it includes all accidents instead of only "lost time" accidents, as already stated; and, second, because it states the relative ratings in percentages instead of numbers. We feel that a rating expressed as a percentage (e. g., 78 percent) is readily understood by the average seafaring man, whereas a mere number (say 13.24) is quite meaningless to him. We think this fact alone will go far toward popularizing accident frequency statistics throughout our fleet and is therefore sufficient reason for its adoption.

A question may arise as to the reason for our calling two accidents per man per year a zero efficiency rating. This figure was finally adopted by the trial and error method (after rejecting several other figures) as giving the best expression, percentagewise, of our idea of good and poor safety control. In practice, we find that approximately 70 percent constitutes a good "passing mark" in safety control, which we think is in accord with generally accepted school-grading standards, and will be so understood by our officers. Experience alone will prove whether our system is as good as we believe it to be.

Using this system, we recently published the standings of all our ships. They ranged from a low of 57 percent to a high of 100 percent (one ship actually had no injuries of any kind on a 75-day voyage—an outstanding record which we don't expect to happen often) and the fleet average was 5.2 accidents for an average voyage of 87 days with an 80-percent safety efficiency rating. This (since it includes all accidents) we regard as very good, and we will be quite satisfied if we can hold it. An interesting side light to the publication of these statistics was that it provoked a surprising amount of discussion, accusations of unfair accident reporting, just plain "kidding," and other indications of interest in the relative standings, which we interpret as a favorable omen. We think it means the awakening of a spirit of competition between the ships to outdo each other in safety efficiency. We hope we are right.

As regards actual results attained by our safety program, we haven't compiled the figures as yet. All I can say is that our accidents have declined materially in the last six months and that those that have occurred have been, for the most part, minor in character. This can be credited, of course, either to our safety program or to just good luck. But our experience with luck so far is that only the bad variety ever visits the steamship business; so we are inclined to give full credit to the program.

So far I have discussed accident control on board ship. But there is another phase of safety which we regard as equally important. It concerns the physical condition of the men we employ to sail our ships.

Life at sea still retains a sufficient element of ruggedness to make it safe for only those who are physically able to take care of themselves under all—including emergency—conditions that they may encounter during a long voyage. They must also have the physicial resistance to withstand the effects of sudden and severe weather and climatic changes, various tropical ailments and other hazards, at sea and ashore, that have always been—and probably always will be—part and parcel of a sailor's life. In short, the sea is no place for weaklings. They are almost sure to land in the hospital, through accident or illness, before the voyage is completed, simply because they lack the physical stamina to do otherwise. It isn't their fault, but the results are mutually harmful—to them and to us.

The responsibility for ensuring a physically fit crew is really that of the steamship operator. We have always known this but, due to conditions beyond our control, there was little we could do about it till recently. This year, however, we took decisive steps to solve the problem and we think we have done it.

We did so by establishing a medical department of our own. It comprises a medical director, a port doctor and a registered nurse, the last two being full-time employees with offices on our Brooklyn pier. They have modern diagnostic and sanitary equipment to work with.

Prior to signing on, our medical department subjects every man aboard—from the master on down—to a rigid medical examination, which includes a chest X-ray, urinalysis, blood tests, and other procedures. Our health standards are rather strict but they are necessarily so, and the unions have agreed to abide by them. As a result of this screening process, our rejections, since we instituted this program, have averaged approximately 5 men per ship as against our former average (when we employed an outside medical service) of approximately 5 men per year for the entire fleet. This is a ratio of about 64 to 1. In other words, we now reject 64 men as medically unfit to every 1 man that we rejected before. Clearly, this has saved us a large amount of expense due to lost time from illnesses, not to mention the probable avoidance of many accidents, the costs of hospitalization, repatriation, the employment of replacements and the defence of law suits that often follow in the wake of accidents or serious illnesses. I might also add that many of our "rejects" have learned for the first time of fundamental bodily defects, such as incipient tuberculosis, heart ailments, etc., that are still cureable—but might not remain so if allowed to go untreated much longer. Also that 45 percent of those rejected were later employed after taking the treatments recommended by our medical staff. So the advantages of an efficient screening program work both ways.

Our medical department also makes frequent inspections to report on the sanitary condition of our ships, provides medical advice and medicines for the prevention of tropical diseases, venereal diseases, etc., and does all it can, by remote control, to insure the good health of our men at sea.

The incidence of malaria during certain seasons on our west African ships is a problem we have not yet solved. We supply our ships with a recent and excellent antimalarial drug (Aralen) but we cannot compel our men to take it, and many of them don't. This latter indifference we fight with propaganda bulletins from our safety department—so far with but minor success, though we hope it will increase as our chief propagandist improves his technique. Recently an experiment was tried on one of our ships. The pharmacists/mate gave a lecture to the crew on the dangers of malaria, and how to avoid it. The results were very encouraging. Only one case of malaria was experienced on this ship instead of the half dozen or more that we expect during the malaria season. We shall pursue this experiment further.

Venereal disease constitutes a further problem similar to the malaria problem, and is handled in the same manner—and with even more disappointing results. Our medical program has been in operation only 7 months now, but I think I can safely report on it as follows: (1) Our screening process is a definite success and is "paying off" in results, and (2) our health campaign aboard ship has thus far been disappointing, but we think we are on the right track and hope we can present a better report on this phase of our safety endeavors a year hence. Again we think that more thought should be devoted to the health aspect of safety than is presently being done by the industry.

Our safety program includes one other feature—pier safety. This concerns itself primarily with fire prevention and protection and includes periodic inspections by our safety director to see that all municipal and company pier regulations are being observed. A pier fire squad has been organized, equipped, and trained and has already proven its worth by quickly extinguishing, with a minimum loss, a blaze that was inadvertently started by some repairmen on the roof of our Brooklyn pier a few months ago. However, our pier safety program is a rather involved subject and I won't attempt to go into it any further. We feel, however, that it is wise to have our safety director check on our pier superintendent—a very busy man when ships are alongside—just to be sure that the regulations we have established are enforced at all times.

And that just about covers my subject. I might merely add that, though we think we have always been safety conscious, we have not made the effort until recently to establish a formal program to carry our preachings into practice. But now that we have, we are glad we did. In other words, our experience in setting up a safety program has proven itself to be well worth while. That, in a nutshell, is my message.

SAFETY ABOARD TANKERS

by

J. D. Rogers, Vice President
Esso Shipping Company

The great size and high speed of many of the vessels that have been added to the world's tanker fleets during the past few years have served to emphasize the need for increased attention by management to safety on tankers. A high degree of vigilance on the part of operational personnel afloat and ashore is essential to insure the preservation of life and property. Teamwork within the operating groups and between these groups and management is an important requisite in successful safety work. Cooperation of this nature requires a great deal of time and attention to details but results are sure to make such efforts worth while.

Conditions at sea brought about by the action of wind and sea create

added hazards not encountered on shore. An unsteady deck is such a hazard and is one that is often accentuated by storms and bad visibility. When tankers carry inflammable cargoes, the fire hazard is perhaps the greatest threat to the ship and its crew. All these factors point up the special need for a safety program for seagoing tank vessels.

The primary requirement for any successful safety program is genuine interest on the part of top management. Without the cooperation and interest in the activities of the safety group on the part of management, the best planned program will not meet with complete success. The delegation of responsibility for safety work to one person or one group also is essential if maximum benefit is to be obtained. Enthusiasm for the job is a quality eminently to be desired in those to whom responsibility for safety work is delegated.

Shortly after the end of World War II, my company, as an owner of a large fleet of oceangoing tankers, decided to designate a member of our seagoing engineering staff as a safety engineer. This man devotes his entire time to safety on tankers. In addition to following up safety methods, procedures, and practices, the safety engineer regularly inspects all vessels and prepares reports covering any condition he considers unsafe. Each report is forwarded to the master of the vessel and a follow-up is maintained until confirmation is received that the unsafe condition has been corrected.

Safety aboard ship may be divided into two broad categories—vessel safety and personnel safety. Further discussion will be based on these two points.

VESSEL SAFETY

Three of the principal types of vessel accidents are collisions, groundings, and fires or explosions. No attempt will be made to discuss in detail the first and second types of accidents except to refer to the navigational equipment with which the vessels of a representative tanker fleet have been equipped.

The gyro compass, radio direction finder, depth-finding installation, and radar are the principal present-day aids to safe overseas navigation. The gyro compass, depth-finding equipment and radio direction finder have been available for many years. Since the end of World War II, radar has been developed rapidly and has, to a very great extent, attained the status of standard equipment aboard tankers.

Although fires and explosions occur infrequently, they represent the most serious hazard in tanker operation. The possibility of loss of life and damage to property when a fire or an explosion occurs is undoubtedly greater than in any other type of accident. After the last war, discussions were held with the U. S. Navy Department in Washington regarding their experiences in fighting fires aboard combat vessels. The Navy very cooperatively supplied information regarding a number of new devices which had been developed during the war and were found to be very effective in extinguishing shipboard fires. As a result of this conference, the following program was initiated by Esso Shipping Co.:

1. Improved fire-fighting equipment including fog nozzles and improved foam-handling equipment was placed aboard all of the company's vessels.
2. Through the courtesy of the United States Navy, licensed officers were sent to the Navy's Fire-Fighting School in Philadelphia to receive training in the proper use of the improved fire-fighting equipment.

Machinery spaces on tankers are protected by fixed CO_2 or foam systems. Pump rooms and cargo tanks are protected with fixed CO_2 or steam smothering systems. The following tabulation sets forth the additional specialized fire-fighting equipment which has been placed aboard those tankers, on the basis of the information released by our Naval authorities.

26,800 D. W. T. SUPER TANKERS

4—2½-inch and 13—1½-inch all purpose nozzles.
3—2½-inch marine strainers.
3—12-foot and 4—4-foot low velocity fog applicators.
4—2½-inch and 3—1½-inch fog foam nozzles.

On this type of tanker a liquid foam tank having a capacity of 750 gallons is installed in an engine room compartment above the boilers and connected through a fixed piping system to the fire pumps and main fire line by means of which foam can be delivered to any part of the vessel.

T-2 TYPE TANKERS

4—2½-inch and 14—1½-inch. all-purpose nozzles.
4—2½-inch marine strainers.
3—12-foot and 3—4-foot low velocity fog applicators.
2—1½-inch mechanical foam nozzles with pick-up tubes.
20—5-gallon cans of mechanical foam solution.

Other classes of tankers of this fleet are supplied with substantially the same fire-fighting equipment as that listed for the T-2 class.

When installing new fire-fighting equipment such as that listed above, it is important, particularly on the war-built tankers, that all fittings be inspected. It was found that on a number of vessels some of the hydrants had New York fire department hose threads while others had National Standard hose threads. The latter were ultimately selected as standard on our tankers. Inspection by the safety engineer after the equipment is placed aboard is advisable to insure that it is properly installed and that the crews are familiar with its operation.

On all vessels the 2½-inch all-purpose nozzles and the 12-foot low velocity fog applicators are placed at fire stations on weather decks near the forecastle head and the midships and afterhouses. Since smaller fire hose and shorter applicators are easier to handle in confined spaces, the 1½-inch all-purpose nozzles are located at fire stations in the quarters and machinery spaces and the 4-foot low velocity fog applicators are placed in the machinery spaces.

Because of the fine openings in the heads of the low velocity fog applicators, they are easily clogged with rust. To prevent such clogging at a critical time, marine strainers are connected to fire hydrants on the weather deck and in the quarters at locations where the fire line is of sufficient length to cause the accumulation of excessive quantities of rust.

On the super tankers equipped with fixed foam systems, the fog foam nozzles are placed at the forecastle head, midship house, forward end of the afterhouse, and in the engine room. As T2's and many other types of tankers are not equipped with the fixed foam system, one foam nozzle, pick-up tube, and five cans of foam are located midships and another such combination is placed aft. Ten additional cans of foam are stored in accessible storerooms. These portable foam-producing units are readily available at all times for use on deck or in quarters.

Twenty-five portable 15-pound CO_2 or 2½-gallon foam extinguishers also are placed aboard each tanker in this fleet and are located in various parts of each vessel where fires are most likely to occur. Portable extinguishers are supplied in excess of legal requirements to provide officers and crewmen with readily available means of extinguishing fires with the least loss of time and thus prevent a fire from becoming serious.

To assist in the training of ships' personnel in the selection of the equipment best suited to meet a given situation, we prepared a safety circular letter regarding various types of fires such as fire after a pump room explosion, fire in a cargo tank which has not been ruptured, and fire in a cargo tank which has been ruptured. Means which might be effectively employed in each instance to extinguish the fire are outlined in this circular.

As part of a safety program, the adoption of a plan to send all licensed officers to the fire-fighting school conducted by the United States Navy at Philadelphia Naval Shipyard cannot be too highly recommended. When a safety engineer is employed, it is desirable that he be afforded the opportunity of taking the 6-weeks' course at the fire-fighting school to fit him as instructor and coordinator in the training of personnel.

The usual period of training for officer personnel is 1 week. The course includes a study of the chemistry of fire, the use of modern fire-fighting equipment and actual practice in fighting fires of different types. The value of this course lies in the fact that it not only makes an officer familiar with the proper use of the new equipment but gives him confidence that fires can be extinguished if the proper methods are used. Officers who have taken this training place special emphasis on the last-mentioned benefit and state that the knowledge gained does much to overcome the inherent fear of an oil fire.

While the fire-fighting school is engaged primarily in training United States naval personnel, its facilities are being made available to citizens of the United States who serve in the Merchant Marine and to members of the municipal fire departments in this country. A number of American shipping companies have sent some of their seagoing personnel to the navy fire-fighting school and virtually all of the officers serving on Esso Shipping Co.'s tankers have taken this training.

Certain cargoes carried in bulk on tankers call for additional safeguards to be installed in the cargo-handling system to minimize specific hazards. Tank vessels transporting liquefied petroleum gas in bulk, carry this cargo in pressure vessels usually built into the regular cargo tanks and extending through the weather deck. To minimize the hazard which would be created in the event of failure of the cargo-handling system, remote controlled quick-closing valves are installed at the tank outlets. These valves can be operated from any one of several stations on the vessel in case of emergency. Vessels in this service in one fleet, in addition to the regular fire-fighting equipment, are also supplied with dry chemical portable fire extinguishers which are considered very effective in fighting this type of fire.

Some companies which operate vessels transporting grade A products (over 14-pound Reid vapor pressure) install equipment which permits the loading operation to be carried out without opening the ullage covers. Tanks are gaged visually through sight glasses, ullage pipes, or by mechanical gaging devices. The gas and air mixture displaced from the tanks during loading is carried off through the venting system with which all modern tankers are fitted. In addition, deck-sprinkler systems are fitted on vessels in this service to keep the temperature of the decks as low as possible in warm climates in order to reduce cargo vapor pressure.

PERSONNEL SAFETY

A large majority of personnel accidents are due to unsafe acts and only a very limited number to unsafe conditions. The education of ships' personnel, therefore, is of primary importance. As a step in this direction, the practice of supplying the men who man the tanker fleets with a breakdown of the various types of personnel accidents can be recommended.

The following analysis of personnel accidents that occurred during the year 1949 on board the vessels comprising the largest tanker fleet under the American flag is submitted for illustrative purposes:

	Percent
I—Falls	36.2
II—Handling objects	14.1
III—Handling hand tools and galley knives	8.6
IV—Striking against obstructions	8.6
V—Contact with hot or corrosive substances or hot surfaces	6.7
VI—Struck by flying objects (eye injuries)	6.3
VII—Struck by falling objects	4.6
VIII—Contact with moving machinery or equipment	3.8
IX—Struck or thrown by sea	2.5
X—Crushed by doors, etc	2.1
XI—Miscellaneous	6.5
	100.0

Simplified statistics such as these can be readily posted on bulletin boards and provide good material for discussion at ship's safety committee meetings. Further analysis can be given in the form of safety circular letters for the use of the ship's safety committee. Various types of personnel accidents and their principal causes can be described in these circulars, and recommendations made for minimizing them.

The high percentage of accidents due to falls, combined with the severity usually encountered in falls from gangways, led one company to study the problem at a terminal at which dock occupancy by tankers is almost 100 percent. A fatal accident had occurred at this terminal when a seaman boarded a vessel which had almost completed discharging. The man arrived at the foot of the steep gangway with a suitcase and a parcel. Leaving the parcel at the foot of the gangway, he carried the suitcase up to the deck of the vessel. He returned to follow the same procedure with the parcel and, when just at the top of the gangway, lost his footing and fell, dropping between the ship's side and the dock side. The current swept him away before he could be rescued.

To minimize the hazards caused by a steep gangway angle, an experimental gangway platform was constructed at one dock. This platform was erected about 8 feet above the dock floor and materially reduced the angle of the gangway when a tanker was in a light condition. From this experimental installation, a permanent platform with a retractable gangway has been developed.

Procurement and maintenance of safety equipment applicable to tanker operations is a vital part of a safety program. In one fleet, the owner furnishes each vessel with two fresh air hose masks, a resuscitator, a combustible gas indicator, safety belts, and goggles as standard equipment. However, the mere providing of such equipment is not sufficient. Maintenance of this equipment in good operating condition, instruction in its proper use and supervision to see that it is used when required are also essential.

A case of failure of supervision in one accident will illustrate the last-mentioned point. The forward bulkhead of the midships house of a vessel was being painted in port by a crew of three men working from a staging. Prior to coffee-time while the mate was around the fore deck, all had been wearing safety belts. However, with no direct supervision after the break in work, one man returned to the staging without his

safety belt. Shortly afterward, the staging fell resulting in his death.

Special safety problems arise in the case of tankers engaged in transporting specialty products or chemicals in bulk or, in certain trades, general cargo. Plans for the conversion of tankers to such services should be submitted to all concerned with safety for review to insure that necessary precautions are provided for safeguarding personnel. It should be the responsibility of the safety engineer and his associates to stipulate the additional equipment required for the protection of the crew and to prepare instructions for their guidance.

As an example, in the case of a tanker which had been converted to transport part cargoes of aromatic solvents, it was found that the combustible gas indicator supplied for use on vessels carrying the usual petroleum products was unsuited for the detection of this type of gas in dangerous concentrations. An indicator with proper range was procured and placed on this vessel. In another instance, the officers of a vessel carrying part cargoes of alcohol were warned that foam was not a suitable fire-extinguishing agent for an alcohol fire. They were instructed that fog, CO_2, or steam smothering should be used if they were called upon to fight such a fire.

Some fatal accidents have been caused through the use of carbon tetrachloride as a cleaning agent. On one vessel the crankcase of a Diesel engine was cleaned with this material and one of the men involved inhaled sufficient vapors to cause his death some days after the exposure. The owner decided that there were other cleaning jobs on vessels where sufficient quantities of carbon tetrachloride vapor could accumulate to cause similar accidents and a substitute cleaning fluid with less toxic properties is now being supplied.

Channels of communication between shore and ship are an extremely important part of any safety program. A safety bulletin issued at regular intervals or a series of safety circular letters have great value in affording the master and the officers of each vessel concise information regarding safe methods and procedures. The development of a safe procedure on one vessel can be quickly brought to the attention of the entire fleet through the medium of a bulletin or circular letter if adequate attention is given to this aspect of a safety program. If a house organ is issued for seagoing personnel, safety messages over the signature of the executive officer of the company provide an excellent means of bringing to the attention of all seagoing personnel the fact that the management is behind the safety program.

The formation of ship's safety committees has been mentioned many times as a fundamental part of any program for safety at sea. Safety committee meetings have been a feature of the safety program of my company for more than 25 years. Hundreds of excellent suggestions have been made by these committees, and after review by shore-side personnel, a great many of them have been approved and put into effect. These meetings afford ships' officers an excellent opportunity to observe and discuss any hazards which exist aboard their vessels and, in the minutes of the meetings, to recommend remedial action.

Any safety program should include a thorough investigation of all serious accidents to determine the causes so steps may be taken to avoid a recurrence. The findings of these investigations permit prompt elimination or correction of faulty equipment throughout the fleet. Disciplinary action can be taken when it develops that an accident was caused by negligence of any member of a vessel's complement.

No safety program would be complete without a port safety committee comprising the port captain, port engineer, the responsible safety executives of the company, and a member of top management. This committee should discuss general problems relating to safety and establish policies for the guidance of all concerned. Recommendations for major structural alterations on vessels, changes in operational procedures, and the procurement of new equipment are proper matters for consideration by this committee.

To summarize, the salient features of an effective safety program for tankers are as follows:

1. Top management must take an active part in safety matters.
2. Responsibility for safety work should be delegated in language that will not permit misinterpretation. The appointment of a safety engineer is desirable when a sizable fleet of tankers is involved. The safety engineer should devote his entire time to making shipboard safety inspections, coordinating the work of the ships' safety committees, investigating major accidents and handling allied matters.
3. Promotion of an active interest in safety on the part of ships' personnel should be accomplished through ships' safety committees and educational programs.
4. Those responsible for safety should keep abreast of all developments involving improved equipment for the safety of ships and ships' personnel.

GREAT LAKES SAFETY PRACTICES

by

John L. Horton, Marine Superintendent
The Cleveland-Cliffs Iron Co.

I have divided my observations on Great Lakes safety practices into three parts. They are: One, a brief look at our safety program; two, accidents to ship personnel, and, three, with the help of slides I shall illustrate several points which will give you a picture of our operation and safety problems.

Our safety program starts at the annual meeting of our masters and chief engineers each spring, where we stress the importance of the development of good seamanship and good housekeeping to keep the ships safe at all times. Our office personnel further press the point when contacting the ships during the sailing season. Posters and bulletins are used each month to keep safety-first ideas before the eyes of the entire crew.

The safety committee meeting, held each month on board ship is the outstanding part of our program and the part which is most responsible for making our crews "safety minded." The committee consists of the third mate, who is chairman, the third assistant engineer, who is secretary, and an unlicensed seaman from the deck, engine, and galley departments.

This committee conscientiously studies the ship's work and reviews any job that could be dangerous * * * then makes recommendations. The members are the leaders in keeping safety-first rules obeyed. The work of this committee is supplemented by the suggestions of the ships officers who meet at least once a month.

The minutes of each safety meeting, and any unusual accident prevention ideas are reported in the Bulletin, the Lake Carrier Association's monthly publication. This publication is distributed to 313 of the large bulk freighters on the Lakes.

The association further supplies posters to the ships, which develop the ideas presented by the ship safety committees. Seamen on board ship are used to model or illustrate safety ideas. Here is a sample of the posters.

Officers who are successful in getting the idea of safety first across to their unlicensed seamen soon see a reduction in the number of accidents

aboard their ship—they see an improvement in the morale of the crew.

I think the most universal recommendation which we receive from our ships' officers in promoting safety aboard ship, is the constant request to be supplied with outstanding seamen. They have told us time and again that it takes a good man to be a safe man.

In the majority of our accident cases, we find that the question of the ability of the injured man was a contributory cause of the accident itself.

We have endeavored to see that good seamen get aboard ship. We require all seamen to have a physical examination before they are employed. These examinations have revealed seamen who are physically unfit for duty aboard ship. However, once the sailing season gets under way, it is not always possible to employ replacements who have had physical examinations.

The Korean War has brought back the large crew turn-over that our ships experienced during World War II. Therefore, many seamen will be going aboard ship without being examined, and many of them will never have had any training in safety. Many will have no interest in it, and our safety program must point to the education of these seamen.

In my own particular fleet we have encouraged the self-improvement of our seamen, through study and training. The thought behind this move is that a seaman can only practice safety first when he understands the rules of good seamanship.

We have particularly urged our seamen to take advantage of the raise in grade and other supplementary courses offered each winter by our Lake Carriers Association schools. Each winter we organize groups of unlicensed seamen for a 30-day training period at the Sheepshead Bay Maritime Training Station. We urge our seamen to take advantage of the United States Maritime Service correspondence courses, and on one occasion enrolled all our deck officers in one particular course.

I have always believed that we have been making a mistake in employing men new to the industry who are without any knowledge of shipboard life. It is important that the beginner get a correct start at the job. Often it is impossible for the ships' officers to do all the training necessary at the time when the seamen need it most.

In an endeavor to aid in this respect, we have been employing a number of seamen from the entry training school operated by the United States Maritime Commission at St. Petersburg, cadets and graduates from Kings Point, a few from the State maritime academies, and the New York Vocational School.

The training schools have provided safety training by indoctrinating the trainees with good seamanship practices, and have acclimated the men to shipboard life.

Turning our discussion to accidents aboard ship, we generally find them divided into three important groups:

One—Accidents on ladders used to board the ship, ladders installed on the ship, and ladders in the cargo hold. In this same group we could add accidents from stagings and bosun chairs.

Two—Accidents on deck and especially when opening and closing hatches and handling wire rope and winches.

Three—Accidents in the engine and boiler room.

Because of the nature of Great Lakes' docks and the ships themselves, ladders are used for the purpose of boarding the ship. Serious accidents have occurred here, sometimes through negligence and sometimes because of the tipsy condition of the seamen.

We have never found a seaman who would admit to being sufficiently tipsy so as to fall from a ladder, but we occasionally have a seaman attempt to disprove intoxication by citing his actions prior to the accident. One seaman visited a local pub and when returning to his ship fell from the top of the ladder. During the investigation of the accident, the seaman admitted having had a few beers, but claimed strict sobriety. He based his claim on the fact that he had crawled up the ladder of one vessel loading, walked across the deck and proceeded up the ladder to his ship. However, when near the top, he became especially dizzy and fell between the two ships. Only the quick action of the watch on deck saved the man's life.

Several types of boarding ladders are currently in use, they are: The self-leveling step, aluminum rung, and wood rung ladders. We have been attempting to improve the safety of our ladders, and are now experimenting with a new model. It is of light, but sturdy wood construction. It has nonleveling wood steps covered with nonskid abrasive. A wood handrail of 1½-inch diameter is secured on each side of the ladder.

Many of our serious ladder accident cases occur in the cargo hold where clean-up gangs fail to be cautious. Here is a typical case:

Following the completion of unloading, a shoveler proceeded to climb up a channel-type ladder. Despite signs at each ladder reading "Do not carry tools up ladder," he attempted to carry his shovel on his wrist. When proceeding up the ladder, the weight of the shovel caused him to lose his balance when he reached for a rung and he fell 10 feet to the tank top. He landed on his feet, but injured his heels and back in doing so. He may never be able to return to manual work.

One unusual accident concerned an engine department crew member working aloft, painting the funnel. Before he went aloft, three seamen tested out the bosun chair by putting their combined weight upon it—they decided it was in safe condition. A fireman went aloft and worked all morning. At the sound of the dinner bell, the men on deck proceeded to lower him away, at which moment the strap on the chair broke and the seaman fell to the deck and sustained serious injuries. Our corrective measure in this case was to turn all funnel painting over to the deck crew who are experienced in going aloft even though it has been traditional for Great Lakes engine departments to do this work.

The prevention of accidents on deck is an important duty of our officers. The mechanical lay-out of our bulk cargo carriers requires hatch gear for 10 or 36 hatch openings. A real problem is created in the safe opening and closing of this equipment. The ship's deck crew handles the operation.

The general arrangement of the patent hatch or telescopic hatch is such that three deck men and one winch operator can open or close hatches in a little less than 1 hour. This operation is longer and the hazard greater when tarpaulins are secured in spring and fall months of the year.

The number of injuries to fingers, through handling the cable and block, make up one of the largest groups of ship accidents. A seaman must necessarily be nimble of finger and foot when working around hatches.

Serious accidents have occurred when seamen have fallen into the cargo hold. This accident is generally fatal—however, there have been cases of seamen falling to the bottom of the cargo hold and coming out with relatively minor injuries. One seaman walked across the hatch covers after he had hooked up the bridle, in preparation for pulling the hatch open, and the signalman motioned the winch operator to take a strain. Consequently the seaman had his

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footing pulled out from under him and he fell to the tank top. He sustained head injuries but no broken bones. He was able to resume working duties after a hospitalization period.

We had another seaman fall from the side tank top, about 20 feet above the tank top itself and he was detained in the hospital but 1 day. In this case the seaman was holding a wrench on a pipe—the jaws of the wrench slipped and he rolled into the hold. Yet, one man has been killed this year when he fell the same distance. This seaman was investigating some work on the tank top and slipped into the hold.

Safe handling of hatch covers requires a perfect team operation. One man out of step will not only slow up the work, but may cause an accident.

Our newer ships are now equipped with a one-piece hatch which is removed with an overhead crane that travels along the deck on rails. Hatch covers on our large ships can be removed with the crane, in less than 15 minutes.

Another source of injury on Lake ships is our deck engines located fore and aft for securing the ship to the dock. Cables are used on the winch drum to run to the dock and hold the ship in position. The cable size varies from 1 to 1¼ inches.

Our safety first committees constantly remind the winch operators of the danger of failure to keep alert when following signals from the officer at the ship's rail. Winch operators have been seriously injured or killed when they have failed to keep the deck engine under control. The eye of the cable winding into the drum can flop over and injure the operator. Mates standing at the ship's rail have also been caught with the eye of the cable when it was whipped over the ship's rail. We now paint the end 25 feet of the cable white, in order to provide a signal to the operator to get his winch under immediate control when the white end enters the dock.

We have had mates seriously injured by their failure to keep proper lead on the cable, and it has snapped off the top of the ballard, striking them. Improper handling of the winch can break a cable, with the same result.

Engine-room accidents fall into the category of burns, as a result of handling coal fires, working around steam pipes, and injuries sustained from moving or lifting machinery parts.

Accidents while repairing machinery during our fit-out and lay-up seasons claim a large percentage of injuries to fingers and toes. Here are a couple of illustrations: An oiler will be helping to take the main engine apart; he may misjudge an operation, and a finger is caught between two heavy pieces of machinery. A coal passer will be injured by a sledge when holding a chisel. Our fatal accidents in the engine room have been from machine or boiler failures. These have been rare.

The Great Lakes is entering a new era in the engine department, with the introduction of the steam turbine and oil-fired boilers to our ships. The majority of new construction is favoring oil-fired boilers, with 7,000 horsepower steam turbines for the propulsion plant. Heretofore, most of the Lake ships have been coal-fired and are propelled by reciprocating engines.

The new trend should eliminate many of our past accident cases. The passing of the reciprocating engine will see the end of crushed fingers sustained when an oiler makes his rounds, watching the lubrication of the engine. Our modern engine rooms are now so planned that moving machinery is enclosed.

LESSONS FROM CASUALTIES

ACCIDENTS TO PERSONNEL ON BOARD RIVER TOWBOATS AND CARGO BARGES

by

Mr. A. L. Mechling, President

A. L. Mechling Barge Lines, Inc.

In preparing this paper I combined the experiences of several barge lines on the inland waterway. I would like to take this opportunity to express my appreciation for their cooperation. I will give a description of some unusual and usual types of accidents to personnel on towboats, the steps taken to avoid recurrence and various programs for accident prevention carried on by different companies. As most of you know, the barges that are used in the river traffic are of various design; the open hopper type for movement of bulk commodities such as coal, sulphur, sand, gravel, scrap, and cargoes of this nature; the covered barges for movement of grain, sugar, paper, etc.; the tank barges for petroleum, molasses, and acids. There are also special barges such as those for movement of automobiles.

One of the most unusual accidents that has come to my attention was a case where a deckhand was straightening the gaff end of an 18-foot pike pole. He was using a torch to heat the steel point and in handling the pole the opposite end struck the water and forced the hot pointed spike into his chest, piercing his lung. This proved to be a very serious accident. He is still under treatment, and it is doubtfull if he will ever regain his health.

Another unusual accident is the case where a man had placed a loop of a line over a mooring post on a lock wall and stepped back into a coil of line. The fact that the tow was moving, caused the line to pay out, catching the deckhand's foot in a loop of the line. Rather than allow himself to be pulled off the barge into the river, he held onto the barge and the line pulled his foot off at the ankle. This deckhand was new on the job and, of course, did not realize the necessity of watching where he was stepping. The only cure for such accidents is the schooling of new deckhands and attempting to show them the proper way to handle lines and the importance of watching where they step while they are working.

A very unusual accident reported recently was that of a man found dead in a loaded tank barge. How this came about has never been explained, but it was thought that the person, overcome by gas fumes in attempting to remove gasoline through an open hatch, fell into the barge. While this sort of procedure is not allowed or in any way necessary in the usual pumping off of a tank barge, it is possible that the same thing could happen to a tankerman when watching through an open hatch or manhole during the discharging of a gasoline cargo.

Some of the more common accidents in our industry are caused by misuse and improper handling of equipment such as to substitute pipes of improper size for capstan bars which slip when a little pressure is applied thus causing the man to slip or fall. Serious sprains, bruises, and

even broken bones have been the result of an accident such as this. Carelessness in handling or carrying ratchets, allowing them to drop, causes foot injuries. Driving the locking link loose on the pelican hook when there is too much strain on the coupling will cause it to fly and in a good many cases hits the man in the leg. This often causes quite a serious injury. Incidents of this type are responsible for a large number of the accidents occurring on the decks of boats and barges.

Another common accident and probably the one that results in the most serious injury is that of falling into an empty barge such as a hopper barge or falling through the open hatch of a covered barge. This type of accident usually results in broken arms, legs, or broken jaws, fracture of the skull and so forth. We have had one accident such as this that resulted in the man's death. To prevent this sort of accident we have instructed our deck crew to always walk along the gunnel of the barge.

Another accident that has proven fatal is that of a man trying to collect water in a bucket which is attached to a line while standing on the side or the stern of a boat while the boat is in motion. In several cases the man, not realizing the strain caused when the bucket fills, thus loses his balance and is pulled overboard. The turbulent water at the stern of the boat holds a man down and in most cases results in drowning. Orders have been issued to prohibit this practice and we have provided faucets in the laundry rooms or on the deck and have issued orders that all water for scrubbing down must be taken from this source.

In cold weather, icy decks create another hazard that is rather hard to combat. During such periods constant reminder of this danger should be given to the crew.

There are, of course, the usual accidents in the engine room around machines; open belts, pulleys, etc. Every effort should be made to cover all moving parts with suitable guards and maintain continuous supervision, to be sure that guards are kept in place at all times.

Clowning, horse-play, or practical jokes should never be allowed on the towboat or barges.

It is a good policy to paint obstructions such as timber heads and kevels on boat decks and barges and a strip 6 to 8 inches wide around the edge of the line deck with white or other highly reflective paint so they can be more easily seen at night.

The above covers in part the unusual and usual accidents to employees in our industry. How can we attempt to reduce these accidents and promote safety? In companies, where it is practical, a safety engineer should be assigned to carry on the safety program. Also, the practice of holding special meetings to promote accident prevention are advised. Where this is not practical, then an attempt to educate all personnel in methods of avoiding these accidents should be encouraged. In other words attempt to provide safe working conditions and inspire personal safety in our employees. In order to accomplish this it is necessary to have the cooperation of the captain of the boat and through him the mate and chief engineer, as they are in more constant touch with the crew.

In any accident-prevention program it is necessary to keep statistics on the number and severity of all accidents. It is also important to make the same sort of investigation on a near accident, as the only difference between this and an accident that might prove serious, is timing. The purpose of investigation should be to find the cause of the accident so that proper precaution might be taken to avoid recurrence. It should not be made in order to fix the blame, as crew members may withhold vital facts if they thought that any of their associates might be blamed for the accident. In a report from one insurance company an analysis of accident cases showed that most accidents on boats are preventable and that most of them are caused by the failure of the human element. The reports of such accident investigations so far as practical should be distributed from time to time among the employees in the industry. This would tend to bring before the men the necessity of caution in performing their duties. I believe that the human factor must be emphasized as a controlling element in all accident-prevention programs.

Safety posters can be used to good advantage such as the ones of "Bargeline Bill" furnished by American Waterways Operators. Fire drills and life-saving drills should be practiced and thus bring to mind the importance of safety to the crew and prepare them for any emergency. Our company has recently sent out a poster to be kept posted in each cabin and the lounge room of our boats, so the men will be familiar with accident-prevention habits and thoughts.

The primary cause of accidents are: Unsafe habits and practices, running over the tops of barges, improper tools or devices, methods used not suitable, protective devices not used, lack of job vigilance, heedlessness, intemperance, failure to wear goggles, poor housekeeping, improper planning for safety, disregard of fumes or gases, and improper clothing.

Accidents cost money, they are an economic waste and a demoralizing influence in any organization. In order to promote pride, safety, and efficiency in the minds of our employees it is the responsibility of the employer and management to continually put forth their best efforts to promote safety.

ELECTRIC SHOCK AND THE HUMAN BODY

A recent casualty and several severe injury accident cases involving electric shock and burns have emphasized the fact that many people are not treating electricity with the proper respect. Although most of us maintain a very healthy respect for high voltage electrical circuits, the disdain evidenced by many for low voltage or unsafe electrical equipment often proves unhealthy. A discussion of some of the dangers of electricity may overcome popular misconceptions concerning the hazards involved, and, we hope, prevent serious injury or death to you.

Webster's dictionary defines shock as "The sudden stimulation caused by the discharge, through the animal system, of electricity." This definition is so general most of us fail to realize one of the effects of "sudden stimulation" is death and that other lesser effects may be shock or burns.

One of the earliest deaths caused by man-made electricity occurred in France in 1879. Since that time the broad field of electric shock hazard has been and continues to receive much study and discussion. To date there is not one set of opinions, regulations, or data, that furnishes the conclusive information necessary to complete a report of all the hazards of electric shock and limiting values of electric current on board merchant vessels.

During the last 2 years there have been reported at least five deaths due to electric shock on board inspected merchant vessels. Several of these deaths have already been the subject of "Lessons from casualties" in order to eliminate specific electrical hazards.

From the investigation reports it may be determined that such accidents are due to equipment failure, human failure, or a combination of both. It is conceivable that equipment may suddenly fail in the hands of its user and cause him to be fatally shocked even though the equipment was skillfully designed for safety, carefully constructed with the best materials and workmanship, thoroughly tested before use, and used in

accordance with all pertinent safety precautions. But such accidents are rare and human failure must, therefore, bear the greatest part of the responsibility for the accidents that have caused fatal electric shock. In general, the hazard from contact with high voltage power circuit is appreciated by both the electrical worker and the public; unfortunately recognition of the danger of low-voltage shocks is not equally widespread. Electricity, like water, flows in the direction offering the least resistance. Electric voltages may be considered as similar to water pressues, but it is not the "pressure," however, that does the job. It is a question of the quantity (amperes of electricity) rather than the voltage which will do the damage. A man accidentally coming into contact with a 60,000-volt circuit when standing on very dry wood may cause a smaller current to flow through him than a person who inadvertently grasped a 110-volt defective portable appliance when covered with perspiration and standing in water. Ohm's law,

$$I=\frac{E}{R}\ (\text{current}=\frac{\text{voltage}}{\text{resistance}})$$

applies in both cases. The differences in the circuit resistance in both cases may be sufficient to compensate in the differences in the voltages. It is the ratio of voltage to resistance that determines the current that will flow and the danger to life. Current is the proper measure of electric shock intensity; damage to living tissues is caused by current and not by voltage.

The internal resistance of the body is not very great. Across the temple it is believed to be about 100 ohms, while from arm to arm or arm to leg it is about 500 ohms. Fortunately, however, the resistance of dry skin may be as high as 600,000 ohms. When the skin is wet with salt water or perspiration, this resistance may fall to as low as 1,000 ohms. It is probable that many of the fatal electric shocks on board ships are due to a natural but extremely unfortunate tendency for man to carry from shore to ship the rather casual regard for the deadly potentialities for electric circuits and equipment which is acquired ashore. These human failures can be manifested in many ways and the following are examples:

(a) Unauthorized modification to electrical equipment.

(b) Use of unauthorized equipment.

(c) Failure to observe the necessary safety precautions prescribed for electrical equipment which would make such equipment perfectly safe if properly used.

(d) Failure to repair equipment which is known to be defective (such equipment having previously given a mild or nonfatal shock to users).

(e) Failure to inspect and test equipment to find defects.

(f) Failure to remedy defects which may be found by inspection and tests.

(g) Failure of merchant seamen to realize that conditions on board vessels are very different from conditions ashore and are far more conducive to danger from electric shock.

(h) Failure of users of electric equipment to consider their own safety and the safety of their shipmates when using electric equipment.

The purpose of this article is to point out certain fundamental principles relating to electric shock in order that the need for and the nature of safety precautions may be properly appreciated.

Resistance of the Human Body

With certain exceptions the hazard to the human body depends upon the current rather than the voltage to determine shock intensity. The differences in effect between direct current and alternating current on the human body are little and what may be said of one type of current probably applies with equal effect to the other. In considering electric shock it is necessary to recognize that the resistance of the human body cannot be relied upon to prevent a fatal shock. To be sure, when the skin is dry it interposes a high resistance where it makes contact with the electrodes through which current enters and leaves the body. However, on board a ship such condition is the exception rather than the rule.

Tests were made by the National Bureau of Standards to determine the hazards involved in connection with electric shocks. The experiments simulated as much as possible the conditions which may exist on board merchant vessels. It was determined that the physiological effects of electric shocks are related to the magnitude of current rather than to voltage since wide variations in the electrical impedance of the body resistance in the case of direct current occur under different conditions of contact. The electric currents may act upon the living body in three ways:

(a) By stimulation of the tissues, either directly or through their nerve supply.

(b) By inhibition of central or peripheral nerve tissues.

(c) Through transformation of electrical energy into heat.

The specific effect or effects of any electric current on the man will depend upon (a) duration of the shock; (b) the frequency of the current; and (c) the pathway of the current through the body. It has been determined that 0.1 ampere is enough to cause death and if the body resistance can be as low as 300 ohms it follows that 110-volt circuits and lower can supply more than enough current to be fatal. All circuits, even if of only a few volts, are fundamentally dangerous in that they may give rise to currents that are immediately fatal. If 60-cycle alternating circuit is passed through a man from hand to hand or from hand to foot, the following effects have been noted when the current is gradually increased from zero:

(a) At about 1 milliampere (0.001 ampere) the shock is perceptible.

(b) At about 10 milliamperes (0.01 ampere) the shock is of sufficient intensity to prevent voluntary control of the muscles and the man may be unable to let go and free himself from the electrodes through which current enters his body.

(c) At about 100 milliamperes (0.1 ampere) the shock is fatal if it lasts for 1 second or more.

While these figures are approximate, the impedance (resistance if direct current) of the body itself cannot be relied upon to provide protection from shock.

Two conditions must be satisfied for current to flow through a man, namely, (a) the man must form a part of a closed circuit in which current can flow; and (b) somewhere in the closed circuit there must be an electromotive force or a difference in potential to cause current flow. To guard against electric shock a man should, if possible, see to it that his body never forms part of a closed circuit through which current can flow. However, this is not always possible and it may be necessary to include a part of the body in a closed circuit. To be safe, however, the man should be absolutely sure (1) that the resistance in the circuit is high or (2) that any electromotive force or difference of potential tending to cause current flow in the circuit is low; or, still better, (3) that the resistance is high and the difference in potential is low. Where you have high resistance and low voltage, it is possible to have a current which is nonhazardous.

There are basically two different things that can be done to prevent the flow of a dangerous current through a man when he is connected in an electric circuit. One is to make sure that a high resistance is connected in the circuit; the other is to make sure that there is only a small potential difference to cause current flow. As a result of an investigation and tests conducted by the National

Bureau of Standards for the Coast Guard, the following conclusions were submitted:

1. The use of A. C. or D. C. electric current in wet or damp locations at a potential of above 12–46 volts, is extremely dangerous and very likely to produce death if the victim cannot free himself instantly (generator grounded).

2. Voltages above 32 volts for portable equipment aboard ships, whose ship's service generators are grounded is almost certain to produce death if a conductor is touched by an operator working in cramped, damp locations.

3. Voltages between 64 volts and 110 volts are almost certain to produce death on contacts of as short as three-tenths of a second if the operator is working under conditions outlined previously, that would give a total body impedance of 300 ohms.

4. In a ship in which one side of the electrical system is grounded, the only adequate protection is a good ground wire and polarized plug carefully inspected at regular intervals. The grounding of all ship's generators must also be rigidly inspected at the same intervals. As pointed out later, the best ground connection between apparatus and ship is worthless if the ground connection between ship and generator is not satisfactory. If the generator is completely insulated from the ship, there would be little danger of electrical shock. The maintenance of a completely electrically insulated marine generator is a difficult feat. Therefore, as the Maritime Commission has recognized, the generator should be permanently grounded to the ship in an approved manner. (See Recommended Practices of American Institute of Electrical Engineers, ship committee.)

Casualty List

Two men killed and one man seriously injured: While working around live bus bars and cable lugs aboard T2 tanker. See "Lessons from Casualties" in Proceedings—January 1949.

One man killed: While replacing contact fingers of the starting relay in the forced draft blower control panel. See "Lessons from Casualties" in Proceedings—February 1949.

Eleven men killed: By electric shock aboard vessels of the United States Navy in 1946 and 1947. All 11 deaths were charged to human error; investigation proved that not one of them was caused by the sudden failure of approved equipment.

One man killed: Switchboard panel work. Current on panel board believed to be off but board was "hot," (cargo vessel).

One man killed: Shock from bad extension cord (cargo vessel).

Two men killed: They touched an open line (3,000 volts) (cargo vessel and transport).

One man killed: Grabbed hold of open bus bar (cargo vessel).

Badly burned fingers and right hand: He was repairing winch—thought power was off (cargo ship).

A great danger from electric shock is the danger from the uncontrolled reflexes in the muscles of the man, which may cause him to fall down open hatches, into machinery or overboard. These reflexive reactions vary greatly, and it is impossible to predict exactly what an individual will do under a given set of circumstances. Therefore, involuntary muscular reflexive action must also be considered when protective measures against the dangers of electric shock are under consideration. A seaman may not be harmed by the actual electric current that passes through his body, but the nervous reaction may cause him serious injury from falling on contacts. One one-thousandth of an ampere or less may be sufficient to cause an unsuspecting person to jump violently, producing probable injury as a result.

Effect of Current

Death or injury by current flow through the body may result from various effects, some of which follow:

(1) Contracting of the chest muscles which may interfere with the breathing to such an extent as to result in death from asphyxiation on, if the exposure is prolonged.

(2) Temporary paralysis of the nerve center which may result in failure of the respiratory functions, a condition which often continues until long after the victim is freed from the circuit.

(3) Interference with the normal rhythm of the heart, causing a condition which medical authorities refer to as ventricular fibrillation. This is a condition in which the fibers of the heart muscles, instead of contracting in a coordinate manner, contract separately and at different times. The blood circulation ceases under this condition and death ensues. It appears to be the consensus among authorities that the heart cannot spontaneously recover from this condition. It has been estimated that a current flow of 0.1 ampere may be sufficient to cause ventricular fibrillation.

(4) Suspension of the heart action by muscular contraction is believed to take place on heavy current flow. In this case the heart may resume its normal rhythm if the victim is freed promptly from the circuit.

(5) Exposure to high voltage circuits may result in heavy current flow capable of producing sufficient heat to destroy tissues, nerves, and muscles, and cause hemorrhages.

Hazardous Exposures

Voltages far below the common 110-volt supply source are on record to have caused fatal electrical accidents. Fatal shock on low voltages usually occurs under certain conditions which are inductive to lowering skin resistance at points of contact.

Working conditions which are particularly hazardous on low voltage exposures are:

Wet or damp locations; high temperatures, since such are apt to cause perspiration; locations where the worker is freely exposed to grounded surfaces, for example, inside boiler drums, tanks, steel structures, or any other fully or semienclosed metallic structures; in any location where he may brush or lean against or otherwise touch any metal which may be in contact with any part of the ship's structure.

The use of electrical appliances in locations and under conditions as these should be guided by proper methods of controlling the hazard.

Control Measures

Basic considerations in the control of electrical hazards are:

(1) Proper selection of equipment for the type of exposure for which it is to be used.

(2) Installation of the equipment and circuits in accordance with established safety standards.

(3) Maintenance to keep the equipment and circuits in safe operating condition.

(4) Inspections at frequent intervals by competent personnel to ascertain proper maintenance.

(5) Effective grounding of non-current-carrying parts. Insulation of exposed metallic surfaces.

(6) Insulating the operator.

(7) Using voltage low enough to mitigate the shock hazard.

Conclusion

It falls upon those charged with the responsibility of the safety and welfare of seamen to carefully survey the electrical exposure, to employ proper methods of control and to educate the seamen as to the hazards involved. Safety personnel should be guided in their work by regulations set down by the National Electric Code, the National Electric Safety Code, Recommended Practices of American Institute of Electrical Engineers, and by the various publications of such organizations as the National Safety Council, the latter of which deals directly with the electrical hazards of various industries.

ARE DISCONNECT SWITCHES SAFE?

When reading casualty reports it is not pleasant to note how many people lightly regard the hazards of electric shock. In one report the injured man stated "I was engaged in working on a * * * water cooler. I started to start the unit by use of the control switch. After starting the unit I remember nothing." Another report quoted the injured man as stating "I brushed the back of my left hand against something while replacing fuse in fuse box." Another report quoted the injured man as stating "While engaged in disconnecting air compressor control my head came in contact with 440-volt electrical cable."

These reports were picked at random and in these cases fortunately no one was killed, but all persons suffered from burns or shock. During the last few years a number of fatalities have occurred by people coming in contact with exposed electrical conductors and bare metal parts.

In connection with control panels, fuse boxes, and disconnect switches, the evidence shows that physical contact with energized electrical conductors or bare metal parts can happen very easily on board vessels, especially in connection with disconnect switches located within inclosures that are not of watertight construction.

One illustration of the possibility for electric shock and severe burns is set forth in figure 1. This panel illustrates disconnect switches mounted wholly within the inclosure. The operation of these switches can only be made by physically grasping and moving the switch handles. In performing this operation the proximity of live wires or bare metal parts to the switch handle introduces a definite hazard which should be eliminated.

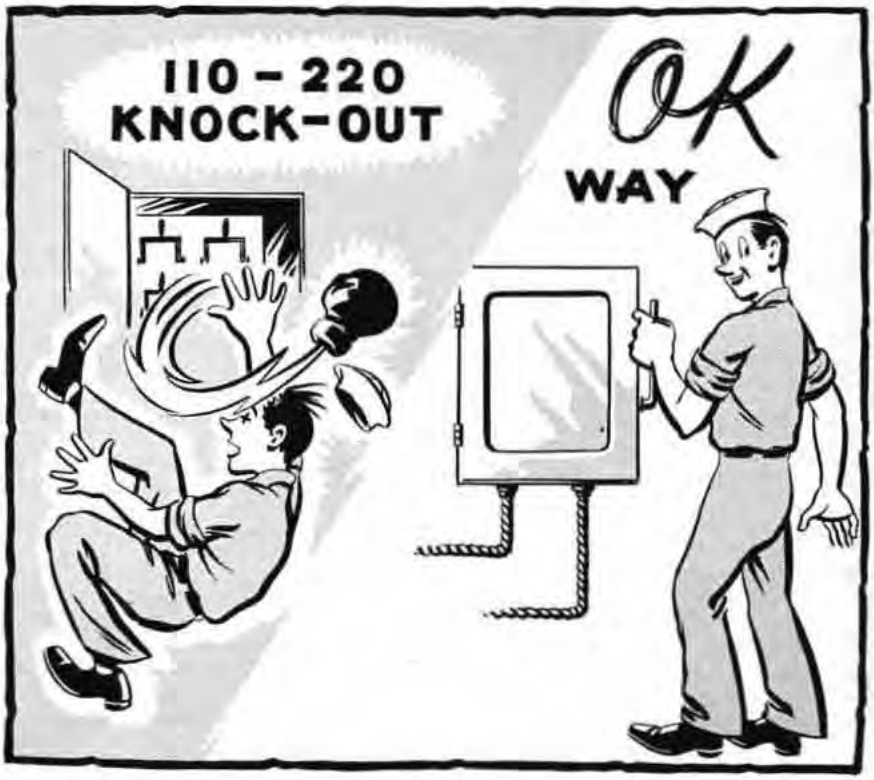
In the case of an installation of a motor controller the disconnect switch should be so arranged as to be operative from outside the panel and so constructed that the pulling of the switch will not be a hazard to the operator. This hazardous condition is recognized by most people and the National Electrical Code provides:

> "Switches and circuit-breakers, except pendent and service type snap switches and knife switches mounted on an open face switchboard or panel board shall be of the externally operable type inclosed in metal boxes or cabinets."

The National Electrical Code inferentially prohibits the installation of any motor controller whose disconnect switch is not externally operative by stating that "The disconnecting means shall be readily accessible." The provision for externally operative disconnect switches does not conflict with the requirements of the American Institute of Electrical Engineers Standard No. 45. Subsection 27.01 of this standard requires disconnect switches in waterproof inclosures to be externally operative. The Coast Guard follows the A. I. E. E. Standard No. 45 for electrical requirements on merchant vessels. While the arrangement shown in figure 1 does not conflict with present requirements of the Coast Guard, such an arrangement can no longer be recommended for use on merchant vessels and action is being taken to require externally operative disconnect switches. A Navigation and Vessel Inspection Circular No. 7–50 containing the recommendations of the Commandant pending the preparation of appropriate mandatory requirements is reprinted on page 208.

In view of the danger of accidentally contacting a live part when operating a disconnect switch mounted wholly within the inclosure, it is strongly recommended that steps be taken to eliminate this hazardous condition on all vessels insofar as

FIGURE 1.



possible. While there may be many acceptable methods of accomplishing the same end result, one method which is considered suitable is to provide for the operation of the switch by external means. Other methods will be considered satisfactory if they provide at least the same degree of safety as an externally operative disconnect switch.

SUGGESTIONS FOR ENGINE DEPARTMENT PERSONNEL

Upon joining a ship, a member of the engine department should acquaint himself immediately with the location of the station assigned to him for fire and boat drills and his duties at such stations. He will find both the duties and the stations plainly stated in the ship's station bill. They should be memorized at once. His ability to go through the drills without a mistake is absolutely necessary for the safety of the ship and all on board.

Find out what your job is and learn all you can about it as soon as possible. It is not enough to learn the lay-out of the machinery and what you are to do when it is running. You should get a good idea of the piping and valve arrangements and learn something about the electrical circuits. Valves and switches are usually marked. Also it is most important to you, your shipmates, and the ship for you to know what emergency equipment is available, where it is, and how to work or use it. Find out where the portable fire extinguishers are, what type they are, and how and when to use them. Be sure you know the location and operation of the fixed fire extinguishing systems. Find out if there is a gas mask available and what kind it is. Be sure you know how to use it, when to use it and when *not* to use it. Part IV of this booklet can help you in learning about emergency equipment and its use.

There are so many different kinds and types of machinery and different methods of operation used on ships today that no attempt will be made in this booklet to describe the duties of the various engine department ratings. There are, however, certain basic duties and responsibilities that should be assumed by all engine department personnel and some of these are set forth below.

Before taking over a watch, if you are a watchstander, be sure to carefully check over the details of the previous watch. Any item which has failed to receive needed attention can then be reported before the previous watch is relieved. Only in this way can it be possible to know that everything is in proper order.

While standing watch, a regular and systematic method of operating routine should be followed. The actual method will depend upon the type and size of the machinery and the layout of the plant, but each duty should be performed at regular periods in its proper time. Report any unusual conditions to the engineer on watch—*at once*. Be sure to pass on a "clean" watch to your relief.

Be on the lookout for sudden changes in readings on thermometers connected to any machinery. Sudden changes indicate trouble or a need for adjustments.

Any noise which is not usual for a machine in operation should be investigated and reported.

Leaks of any kind in oil lines, water lines, and piping of all kinds should be reported at once. Do not allow oil to drip on floor plates, tank tops, or into the bilges—have a drip pan or other container ready for emergencies.

Be sure that you know the valve arrangement *before* you change over lube oil or fuel oil strainers. Is the strainer fitted with a drain valve? Don't take chances on causing a spill or being burned by hot oil.

Learn how to start up and operate the fire pump and find out what other pumps can be used to furnish water to the fire mains. Learn how they can be "cut in."

If you don't know of the location and operation of every suction valve to machinery spaces and how to put them on the line to a pump—*find out*.

Most automatic machinery and equipment are fitted with gages, meters, or "tell-tale" devices. Learn what the proper readings should be and what to do if a warning light or other safety device operates.

When working on idle machinery take every precaution to prevent accidental starting of the machine. Remove fuses from the line to electrical equipment, secure the steam valves to steam machinery to prevent accidental opening and open any drains. Lock or otherwise block the gears on machines that might "move."

When using a steam hose for cleaning or other purposes one man should always stand by the cut-off valve.

Ventilator reach rod handles should be kept secured so as to prevent head injury.

Hand rails are put around machines for your protection—*use them*.

Satisfy yourself that there is no pressure on a valve before attempting to remove a valve bonnet or the valve packing. Master valve leakage or back pressure from an unexpected source may be sufficient to cause injury. If any doubt exists slack off securing nuts about one turn and "break" the joint before removal of the bonnet.

The momentary failure of a condensate pump or ejector may cause the overflow of the hot well when the pump or ejector again starts up. Stand clear and see that neither you nor your shipmate is trapped under such circumstances. Many serious burns have resulted under these conditions.

Any heavy piece of equipment or spare machinery part should properly be secured to prevent movement in heavy seas. Your job may not be involved but your life may be—report it.

Whenever working around winches, either repairing, oiling or testing, take particular precaution to see that your clothing is not caught up in the gears or some other revolving part and that there is no danger of being snared by a cable or line.

FIRE FIGHTING

The fires that never start are the ones that do no damage and kill no people. The job of keeping fires from starting is one job that should be the business of each and every man on all ships. *Cleanliness* and *carefulness* is a team which can prevent most fires. When you see any condition which may cause a fire, it is your duty to report it at once. You should remember that the fire you prevent may save your life. If and when a fire starts, and they do, the job of fighting it must start at once.

Fire fighting anywhere and anytime is a highly specialized job, and for this reason it is necessary for the person who is to fight the fire to know his job. To know his job the fire fighter must understand what fire is and must be able to put the equipment at hand to correct use. The operation, use, care, and maintenance of fire-fighting apparatus, or equipment, is discussed in the following section of this pamphlet and should be carefully studied by every man aboard ship.

It may be generally said that a fire starts when anything that will burn is made hot enough and oxygen is present. (The air around us normally contains about 23 percent oxygen.) The two things that the fire fighter is most concerned with are *the heat* (temperature) and *the oxygen* when it comes to putting out a fire. When one, or when both of these things are removed, the fire will go out. The fire fighter's job is to *cool the fire* by lowering its temperature or *to smother* the fire by shutting off its oxygen supply or by doing both and with the greatest possible speed.

Be Safety Conscious

Amendments to Regulations

TITLE 46—SHIPPING

Chapter I—Coast Guard, Department of the Treasury

[CGFR 50-29]

MISCELLANEOUS AMENDMENTS TO CHAPTER

A notice regarding proposed changes in the regulations for Licensing and Certificating of Merchant Marine Personnel, Motorboats, General Rules and Regulations for Vessel Inspection, and Dangerous Cargo Regulations was published in the FEDERAL REGISTER dated August 25, 1950, 5706 et seq., as Items II, III, IX, X, XI, XII, XIV, XV, XVIII, XIX, XXI, XXII, and XXIII on the agenda to be considered by the Merchant Marine Council, and a public hearing was held by the Merchant Marine Council on September 20, 1950, at Washington, D. C. All the comments submitted were considered and, where possible, were incorporated into the regulations as revised. The purpose of the miscellaneous amendments to the chapter is to provide uniformity in requirements, effect editorial changes, allow Interstate Commerce Commission containers to be used in the transportation of additional items and to provide additional safeguards in promoting safety of life at sea.

By virtue of the authority vested in me as Commandant, United States Coast Guard, by Treasury Department Order No. 120, dated July 31, 1950, to promulgate regulations in accordance with the statutes cited with the regulations below, the following amendments to the regulations are prescribed which shall become effective ninety (90) days after date of publication of this document in the FEDERAL REGISTER.

Subchapter B—Merchant Marine Officers and Seamen

PART 10—LICENSING OF OFFICERS AND MOTORBOAT OPERATORS AND REGISTRATION OF STAFF OFFICERS

SUBPART 10.02—GENERAL REQUIREMENTS FOR ALL DECK AND ENGINEER OFFICERS' LICENSES

Section 10.02–5 (e) (5) is amended to read as follows:

§ 10.02–5 *Requirements for original licenses.* * * *

(e) *Physical examination.* * * *

(5) For original license as engineer the applicant must have, either with or without glasses, at least 20/30 vision in one eye and at least 20/50 in the other. The applicant who wears glasses, however, must also be able to pass a test without glasses of at least 20/50 in one eye and at least 20/70 in the other.

(R. S. 4405, 4417a, 4438, 4441, 49 Stat. 1544, sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 224, 229, 367, 375)

PART 12—CERTIFICATION OF SEAMEN

SUBPART 12.15—QUALIFIED MEMBER OF THE ENGINE DEPARTMENT

Section 12.15–5 (b) is amended to read as follows:

§ 12.15–5 *Physical requirements.* * * *

(b) The medical examination for qualified member of the engine department is the same as for an original license as engineer, as set forth in § 10.02–5 of this subchapter. If the applicant is in possession of an unexpired license, the Officer in Charge, Marine Inspection, may waive the requirement for a physical examination.

(R. S. 4405, 4417a, sec. 13, 38 Stat. 1169, 49 Stat. 1544, sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 672, and 50 U. S. C. 1275)

Subchapter C—Motorboats and Certain Vessels Propelled by Machinery Other Than by Steam More Than 65 Feet in Length

PART 25—REQUIREMENTS FOR ALL MOTORBOATS EXCEPT THOSE OF OVER 15 GROSS TONS CARRYING PASSENGERS FOR HIRE

LIFE PRESERVERS OR OTHER LIFESAVING DEVICES

Section 25.4–1 (a) is amended to read as follows:

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§ 25.4–1 *Number and type required.* * * *

(a) Motorboats which carry passengers for hire shall be provided with an approved life preserver for each person carried, and with an additional number of approved life preservers suitable for children equal to at least 10 percent of the total number of persons carried.

(R. S. 4405, sec. 17, 54 Stat. 166, as amended; 46 U. S. C. 375, 526p)

PART 26—REQUIREMENTS FOR MOTOR VESSELS EXCEPT THOSE OF MORE THAN 15 GROSS TONS CARRYING PASSENGERS FOR HIRE

LIFE PRESERVERS

Section 26.2–1 is amended to read as follows:

§ 26.2–1 *Number and type required.* All motor vessels shall carry an approved life preserver for each person on board. Motor vessels carrying passengers for hire shall also be provided with an additional number of approved life preservers suitable for children equal to at least 10 percent of the total number of persons carried.

(R. S. 4405, sec. 17, 54 Stat. 166, as amended; 46 U. S. C. 375, 526p)

PART 27—REQUIREMENTS FOR MOTORBOATS AND MOTOR VESSELS OF MORE THAN 15 GROSS TONS CARRYING PASSENGERS FOR HIRE

LIFE PRESERVERS

Section 27.2–1 is amended to read as follows:

§ 27.2–1 *Number and type required.* All motorboats and motor vessels shall be provided with one approved life preserver for each person on board. Passenger motorboats and motor vessels shall be provided with an additional number of approved life preservers suitable for children equal to at least 10 percent of the total number of persons carried.

(R. S. 4405, sec. 17, 54 Stat. 166, as amended; 46 U. S. C. 375, 526p)

A machine will not think; the man who runs it is supposed to.

Subchapter G—Ocean and Coastwise: General Rules and Regulations

PART 59—BOATS, RAFTS, BULKHEADS, AND LIFESAVING APPLIANCES (OCEAN)

Section 59.10a (b) is amended to read as follows:

§ 59.10a *General requirements as to equipment for lifeboats, life rafts, and buoyant apparatus.* * * *

(b) Lifeboats, life rafts, and buoyant apparatus shall be fully equipped before the vessel leaves port, and the equipment shall remain in the boat, raft, or buoyant apparatus throughout the voyage. Cargo vessels having a sufficient number of lifeboats on each side to accommodate all persons on board, may have the lifeboats cared for, as required by § 59.38, at sea: *Provided*, That a number of lifeboats sufficient to accommodate all persons on board are fully equipped and ready for use at all times. It shall be unlawful to stow in any lifeboat, life raft, or buoyant apparatus any article not required by this chapter unless such article can be properly stowed so as not to reduce the seating capacity or space available to occupants and so as not to adversely affect the seaworthiness of such lifeboats, life rafts, or buoyant apparatus.

(R. S. 4405, 4488, 4491, 49 Stat. 1544, 54 Stat. 346, sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 481, 489, 1333, and 50 U. S. C. 1275)

PART 60—BOATS, RAFTS, BULKHEADS, AND LIFESAVING APPLIANCES (COASTWISE)

Section 60.8a is amended to read as follows:

§ 60.8a *General requirements as to equipment for lifeboats, life rafts, and buoyant apparatus.* (See § 59.10a of this subchapter as amended, which is identical with this section.)

PART 61—FIRE APPARATUS; FIRE PREVENTION

Section 61.14 (c) (2) is amended to read as follows:

§ 61.14 *Fire-fighting equipment on vessels using oil as fuel.* * * *

(c) * * *

(2) In boiler and machinery spaces of all new passenger vessels, and of all new cargo vessels of 1,000 gross tons and over, there shall be fitted in each such compartment not less than two spray-nozzle hydrants to which shall be attached sufficient length of hose so that any part of the boiler or machinery space may be reached. An approved spray nozzle shall be attached to each hose line.

(R. S. 4405, 4470, 49 Stat. 1544, 54 Stat. 346, 1028, sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 463, 463a, 1333, and 50 U. S. C. 1275)

PART 62—SPECIAL OPERATING REQIREMENTS

Section 62.18 is amended by changing paragraphs (a) and (c) to read as follows:

§ 62.18 *Station bills, drills, and reports of masters*—(a) *Station bills and muster lists.* It shall be the duty of the master of every vessel carrying passengers and all other vessels of over 500 gross tons and subject to inspection to cause station bills and muster lists to be prepared before the vessel sails, which shall be signed by the master who shall be responsible for their preparation. The station bills and muster lists shall be posted in conspicuous places in several parts of the vessel, particularly in the crew's quarters and shall contain full particulars of the signals which will be used for calling the crew to their stations for emergency duties. Special duties shall be allotted to each member of the crew and the muster lists shall show all these special duties and indicate the station to which each man shall go and the duties he has to perform. The special duties should, as far as possible, be comparable to the regular work of the individual. On passenger vessels, when the size of the crew will permit, several members of the crew shall be designated as an emergency squad and required to report to the bridge with certain equipment for instructions. The duties provided for by the muster lists should include:

(1) The closing of airports, watertight doors, fire doors, and fire screens, the covers and all valves of all scuppers, sanitary and other discharges which lead through the ship's hull below the margin line, and stopping fans and ventilating system.

(2) The extinction of fire.

(3) The equipment of lifeboats, life rafts, and buoyant apparatus and their preparation for launching.

(4) The muster of passengers:

(i) Warning the passengers.

(ii) Seeing that they are dressed and have put on their life preservers in a proper manner.

(iii) Assembling the passengers and directing them to the appointed stations.

(iv) Keeping order in the passages and on the stairways and generally controlling the movements of the passengers.

* * * * *

(c) *Emergency squad signals.* The nature of the signals or other means for assembling the emergency squad shall remain within the discretion of the master. Such signals shall not conflict with the navigational signals or signals used for a general alarm.

(R. S. 4405, 4426, 4488, 49 Stat. 1544, 54 Stat. 346, 1028, sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 404, 463a, 481, 1333, and 50 U. S. C. 1275)

Subchapter H—Great Lakes: General Rules and Regulations

PART 78—SPECIAL OPERATING REQUIREMENTS

Section 78.18 is amended by changing paragraphs (a) and (c) to read as follows:

§ 78.18 *Station bills, drills, and reports of masters*—(a) *Station bills and muster lists.* It shall be the duty of the master of every vessel carrying passengers and all other vessels of over 500 gross tons and subject to inspection to cause station bills and muster lists to be prepared, which shall be signed by the master who shall be responsible for their preparation. The station bills and muster lists shall be posted in conspicuous places in several parts of the vessel, particularly in the crew's quarters, and shall contain full particulars of the signals which will be used for calling the crew to their stations for emergency duties. Special duties shall be allotted to each member of the crew and the muster lists shall show all these special duties and indicate the station to which each man shall go and the duties he has to perform. The special duties should, as far as possible, be comparable to the regular work of the individual. On passenger vessels, when the size of the crew will permit, several members of the crew shall be designated as an emergency squad and required to report to the bridge with certain equipment for instructions. The duties provided for by the muster lists should include:

(1) The closing of airports, watertight doors, fire doors, and fire screens, the covers and all valves of all scuppers, sanitary and other discharges which lead through the ship's hull below the margin line, and stopping fans and ventilating system.

(2) The extinction of fire.

(3) The equipment of lifeboats, life rafts, and buoyant apparatus and their preparation for launching.

(4) The muster of passengers:

(i) Warning the passengers.

(ii) Seeing that they are dressed and have put on their life preservers in a proper manner.

(iii) Assembling the passengers and directing them to the appointed stations.

(iv) Keeping order in the passages and on the stairways and generally controlling the movements of the passengers.

* * * * *

(c) *Emergency squad signals.* The nature of the signals or other means for assembling the emergency squad shall remain within the discretion of the master. Such signals shall not conflict with the navigational signals or signals used for a general alarm.

(R. S. 4405, 4426, 4488, 54 Stat. 346, 1028, sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 375, 404, 463a, 481, 1333, 50 U. S. C. 1275)

Subchapter I—Bays, Sounds, and Lakes Other Than the Great Lakes: General Rules and Regulations

PART 96—SPECIAL OPERATING REQUIREMENTS

Section 96.18 is amended by changing paragraphs (a) and (c) to read as follows:

§ 96.18 *Station bills, drills, and reports of masters.* (See § 78.18 of this chapter, as amended, which is identical with this section.)

Subchapter J—Rivers: General Rules and Regulations

PART 113—BOATS, RAFTS, BULKHEADS, AND LIFESAVING APPLIANCES

Part 113 is amended by adding a new § 113.44a, reading as follows:

§ 113.44a *Life preservers for motorboats and motor vessels carrying passengers for hire.* All motorboats and motor vessels carrying passengers for hire shall be provided with one approved life preserver for each person on board and with an additional number of approved life preservers suitable for children equal to at least ten percent of the total number of persons carried.

(R. S. 4405, 4426, 54 Stat. 163–167, sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 375, 404, 526–526t, and 50 U. S. C. 1275)

Section 113.45 (a) is amended to read as follows:

§ 113.45 *Wood floats.* (a) Steam vessels navigating rivers and carrying passengers shall be allowed to use a wood float in lieu of an approved life preserver for each deck or steerage passenger. The wood float shall be constructed in accordance with Subpart 160.039 of Subchapter Q of this chapter.

(R. S. 4405, 4482, as amended; 46 U. S. C. 375, 475)

PART 114—FIRE APPARATUS; FIRE PREVENTION

Section 114.14b is amended to read as follows:

§ 114.14b *Fire-fighting equipment on vessels using oil as fuel.* (a) On all passenger vessels there shall be fitted an approved carbon dioxide or foam-type system for extinguishing fire in the bilges of each fireroom. If engine and boiler rooms are not entirely separate and fuel oil can drain from the boiler-room bilge into the engine room, the combined engine and boiler rooms shall be considered one compartment. The system shall be capable of being operated from a convenient and accessible point outside the space protected.

(b) When a carbon dioxide (CO_2) system is fitted, the quantity of carbon dioxide carried shall be sufficient to give a gas saturation of 25 percent of the gross volume of the largest boiler room from tank top to top of the boilers. The whole charge of gas shall be capable of being released instantaneously by operating one valve and control. All cylinders must be completely discharged in not more than 2 minutes. The arrangement of the piping shall be such as to give a general and fairly uniform distribution over the entire area protected. An alarm shall be provided to give a warning in the space when the carbon dioxide is about to be released. Provision shall be made to prevent the admission of air into the lower parts of the boiler room while the system is in operation.

(c) When a foam-type system is fitted its capacity shall be such as to rapidly discharge over the entire area of the bilge (tank top) of the largest boiler room a volume of foam 6 inches deep. The arrangement of piping shall be such as to give a uniform distribution over the entire area protected. The foregoing system may be of a type employing either two-solution tanks or one or more generators using an approved dry chemical mixture.

(d) All containers and valves by which they are operated shall be easily accessible and so placed that they will not readily be cut off from use by an outbreak of fire.

(e) In addition to the foregoing, there shall be provided one fire extinguisher of the foam type of at least 40 gallons rated capacity or one carbon dioxide (CO_2) of at least 100 pounds in steamships having one boiler room, and one such fire extinguisher in each additional boiler room. These extinguishers shall be equipped with suitable hose and nozzles on reels or other practicable means, easy of access and of sufficient length to reach any part of the boiler room and spaces containing oil-fuel pumping units: *Provided*, That on vessels of 750 gross tons and under, foam-type fire extinguishers of at least 20 gallons rated capacity or carbon dioxide (CO_2) of at least 50 pounds, fully equipped as the fire extinguishers above described, may be used.

(f) At annual inspections, all carbon dioxide (CO_2) cylinders, whether fixed or portable, shall be examined externally and replaced if any corrosion is found; and also shall be checked by weighing to determine contents, and if found to be more than 10 percent under required contents of carbon dioxide, the same shall be recharged.

(g) On all vessels of over 500 gross tons, using oil as fuel, there shall be in each fireroom a metal tank containing 10 cubic feet of sand, fitted with a scoop or shaker, for fire purposes; also two or more approved fire extinguishers of the carbon dioxide (CO_2) type, of not less than 15 pounds capacity each, or two foam-type fire extinguishers of not less than 2½ gallons capacity each.

(h) On all vessels of less than 500 gross tons, using oil as fuel, there shall be in each fireroom a metal tank containing not less than 5 cubic feet of sand, fitted with a scoop or shaker, for fire purposes; also one carbon dioxide fire extinguisher of not less than 15 pounds capacity, or one foam-type fire extinguisher of not less than 2½ gallons capacity.

(R. S. 4405, 4470, 54 Stat. 1028, sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 375, 463, 463a, and 50 U. S. C. 1275)

PART 115—SPECIAL OPERATING REQUIREMENTS

Section 115.18 is amended by changing paragraphs (a) and (c) to read as follows:

§ 115.18 *Station bills, drills, and reports of masters.* (See § 78.18 of this chapter, as amended, which is identical with this section.)

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

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

SUBPART—DETAILED REGULATIONS GOVERNING INFLAMMABLE LIQUIDS

1. Section 146.21–6 (c) is amended to read as follows:

§ 146.21–6 *"Under deck" stowage.*

* * *

(c) Inflammable liquids permitted on passenger vessels may be stowed in a hold or compartment the overdeck of which forms a boundary of a passenger space, provided such overdeck is of a construction in accord-

ance with § 144.09 (f) or (g) of Subchapter M of this chapter.

(R. S. 4405, 4472, sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 170, 375, and 50 U. S. C. 1275)

SUBPART—DETAILED REGULATIONS GOVERNING INFLAMMABLE SOLIDS AND OXIDIZING MATERIALS

2. Section 146.22–100 is amended by canceling present requirements and inserting new requirements for sodium hydrosulfite and sodium sulfide as follows:

§ 146.22–100 *Table E—Classification; inflammable solids and oxidizing materials.* * * *

(In column 1) Sodium hydrosulfite.
(In column 2):
White or grayish-white crystalline powder. Oxidizes in air and more readily so in presence of moisture, giving off sulfur dioxide, a pungent, intensely irritating gas and causing sufficient heat for spontaneous ignition.
Very soluble in water.
Refuse damaged containers.
Stow away from heat.
Do not stow with combustible materials, explosives, or acids (white label).
Keep dry and cool.
(In column 3) Yellow.
(In column 4):
Stowage:
"On deck under cover."
"On deck protected."
"'Tween decks readily accessible."
(In column 5) Stowage:
"On deck under cover."
(In column 6) Ferry stowage (AA).
(In column 7) Ferry stowage (BB).
(In columns 4, 5, 6, and 7):
Outside containers:
Steel barrels or drums:
(ICC–6A) not over 55 gal. cap.
(ICC–6B, 6C) not over 110 gal. cap.
(ICC–17E, 17H, 37K) STC, not over 55 gal. cap.
Wooden barrels or kegs (ICC–11A, 11B) WIC, not over 350 lbs. net wt.
Wooden boxes (ICC–15A, 15B, 15C, 16A, 19A) WIC, not over 250 lbs. gr. wt.
Fiber drums (ICC–21A) WIMC, not over 220 lbs. gr. wt.
Plywood drums (ICC–22B) WIMC, not over 220 lbs. gr. wt.
(In column 1) Sodium sulfide (fused or concentrated and ground).
(In column 2):
In the form of yellow to yellowish-red crystals, strongly caustic.
Freely soluble in water with evolution of much heat.
May also spontaneously oxidize in the air with evolution of enough heat to ignite.
Do not stow with combustible materials, explosives or acids (white label).
Stow well away from any living quarters.
Keep dry and cool.
(In column 3) Yellow.
(In column 4):
Stowage:
"On deck under cover."
"Tween decks."
"Under deck away from heat."
(In column 5) Stowage:
"On deck under cover."
(In column 6) Ferry stowage (AA).
(In column 7) Ferry stowage (BB).
(In columns 4, 5, 6, and 7):
Outside containers:
Steel barrels or drums:
(ICC–6A) not over 55 gal. cap.
(ICC–6B, 6C) not over 110 gal. cap.
Wooden boxes, WIMC (ICC–15A, 15B, 15C, 16A) not over 250 lbs. gr. wt.
Fiberboard boxes, WIMC (ICC–12B) not over 65 lbs. gr. wt.
(In column 1) Sodium sulfide (fused or concentrated but not ground—*may be chipped, flaked, or broken*).
Crystallized sodium sulfide or sodium sulfide fused solid in a metal container is not subject to the regulations in this part.
Sodium sulfide containing 35% or more combined water by weight, fused or concentrated but not ground (may be chipped, flaked, or broken) is exempt from specification packaging and labeling requirements when packed in steel barrels or drums that are equipped with moisture-tight closures.
(In column 2) Characteristic and hazards as for "Sodium sulfide (fused or concentrated and ground)", see above.
(In column 3) Yellow.
(In column 4):
Stowage:
"On deck under cover."
"On deck protected."
"'Tween decks readily accessible."
(In column 5) Stowage:
"On deck under cover."
(In column 6) Ferry stowage (AA).
(In column 7) Ferry stowage (BB).
(In column 4):
Outside containers:
Steel barrels or drums:
(ICC–6A) not over 55 gal. cap.
(ICC–6B, 6C) not over 110 gal. cap.
(ICC–17E, 17H, 37D, 37E, 37F, 37G) STC, not over 55 gal. cap.
Wooden boxes, WIC (ICC–15A, 15B, 15 C, 16A) not over 250 lbs. gr. wt.
Fiberboard boxes, WIC (ICC–12B) not over 65 lbs. gr. wt.
(In column 5):
Outside containers:
Steel barrels or drums:
(ICC–6A) not over 55 gal. cap.
(ICC–6B, 6C) not over 110 gal. cap.
Wooden boxes, WIC (ICC–15A, 15B, 15C, 16A) not over 250 lbs. gr. wt.
Fiberboard boxes, WIC (ICC–12B) not over 65 lbs. gr. wt.
(In columns 6 and 7):
Outside containers:
Steel barrels or drums:
(ICC–6A) not over 55 gal. cap.
(ICC–6B, 6C) not over 110 gal. cap.
(ICC–17E, 17H, 37D, 37E, 37F, 37G) STC, not over 55 gal. cap.
Wooden boxes, WIC (ICC–15A, 15B, 15C, 16A) not over 250 lbs. gr. wt.
Fiberboard boxes, WIC (ICC–12B) not over 65 lbs. gr. wt.

(R. S. 4405, 4472, sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 170, 375, and 50 U. S. C. 1275)

SUBPART—DETAILED REGULATIONS GOVERNING CORROSIVE LIQUIDS

3. Section 146.23–100 is amended by adding requirements for portable tank containers which may be used in the carriage of certain corrosive liquids as follows:

§ 146.23–100 *Table F—Classification; corrosive liquids.* * * *

In column 4 opposite acetyl chloride under "Outside containers" add: Portable tanks (ICC–60) not over 8,000 lbs. gr. wt.

In columns 4 and 7 opposite alkaline corrosive battery fluid and alkaline corrosive liquids, N. O. S. under "Outside containers" add: Portable tanks (ICC–60) not over 8,000 lbs. gr. wt.

In column 4 opposite antimony pentachloride under "Outside containers" add: Portable tanks (ICC–60) not over 8,000 lbs. gr. wt.

In column 4 opposite benzoyl chloride and benzyl chloride under "Outside containers" add: Portable tanks (ICC–60) not over 8,000 lbs. gr. wt. Benzyl chloride must be stabilized when loaded in unlined tanks.

In columns 4, 5, and 7 opposite caustic potash, liquid and caustic soda, liquid, under "Outside containers" add: Portable tanks (ICC–60) not over 8,000 lbs. gr. wt. Marked "For Caustic Potash, Liquid Only" or "For Caustic Soda, Liquid Only".

In columns 4 and 7 opposite electrolyte (acid) battery fluid under "Outside containers" add: Portable tanks, lined (ICC–60) not over 8,000 lbs. gr. wt.

In columns 4 and 7 opposite formic acid under "Outside containers" add: Portable tanks (ICC–60) not over 8,000 lbs. gr. wt. Marked "For Formic Acid Only".

In columns 4 and 7 opposite hydrochloric acid and hydrochloric acid mixtures under "Outside containers" add: Portable tanks, rubber-lined (ICC–60) not over 8,000 lbs. gr. wt.

In column 4 opposite mixed acid add: Authorized only for mixed acid containing not less than 10% sulfuric acid: Portable tanks (ICC–60) not over 8,000 lbs. gr. wt.

In column 4 opposite phosphorus oxychloride under "Outside container" add: Portable tanks, lead-lined (ICC–60) not over 8,000 lbs. gr. wt.

In column 4 opposite phosphorus trichloride under "Outside containers" add: Portable tanks, lead-lined (ICC–60) not over 8,000 lbs. gr. wt.

In column 4 opposite pyrosulfuryl chloride and silicon chloride (tetrachloride) under "Outside containers" add: Portable tanks (ICC–60) not over 8,000 lbs. gr. wt.

In column 4 opposite sulfur chloride (mono and di) under "Outside containers" add: Portable tanks (ICC–60) not over 8,000 lbs. gr. wt.

In column 4 opposite tin tetrachloride, anhydrous, under "Outside containers" add: Portable tanks (ICC–60) not over 8,000 lbs. gr. wt.

In column 4 opposite titanium tetrachloride under "Outside containers" add: Portable tanks (ICC–60) not over 8,000 lbs. gr. wt.

(R. S. 4405, 4472, sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 170, 375, and 50 U. S. C. 1275)

SUBPART—DETAILED REGULATIONS GOVERNING COMPRESSED GASES

4. Section 146.24–100 is amended by adding requirements for portable

tanks which may be used in the carriage of anhydrous ammonia, liquefied carbon dioxide, nitrous oxide, and sulfur dioxide, as follows:

§ 146.24–100 *Table G—Classification; compressed gases.* * * *

In columns 4 and 7 opposite anhydrous ammonia under "Containers" add: Portable tanks (ICC–51) not over 8,000 lbs. gr. wt. (Fixed length dip tube gauging devices are not acceptable.) Authorized only for stowage "on deck protected" or "on deck under cover."

In columns 4 and 7 opposite carbon dioxide, liquefied, under "Containers" add: Portable tanks (ICC–51) not over 8,000 lbs. gr. wt. (Fixed length dip tube gauging devices are not acceptable.) Authorized only for stowage "on deck protected" or "on deck under cover."

In columns 4 and 7 opposite nitrous oxide under "Containers" add: Portable tanks (ICC–51) not over 8,000 lbs. gr. wt. (Fixed length dip tube gauging devices are not acceptable.) Authorized only for stowage "on deck protected" or "on deck under cover."

In columns 4 and 7 opposite sulfur dioxide under "Containers" add: Portable tanks (ICC–51) not over 8,000 lbs. gr. wt. (Fixed length dip tube gauging devices are not acceptable.) Authorized only for stowage "on deck protected" or "on deck under cover."

(R. S. 4405, 4472, sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 170, 375, and 50 U. S. C. 1275)

5. Section 146.24–100 is further amended by deleting the requirements for liquefied petroleum gas (pressure not exceeding 200 pounds per square inch at 100° F.) and by adding new requirements for liquefied petroleum gas (pressure not exceeding 250 pounds per square inch at 115° F.) and liquefied petroleum gas (pressure exceeding 250 pounds per square inch at 115° F.) as follows:

§ 146.24–100 *Table G—Classification; compressed gases.* * * *

(In column 1) Liquefied petroleum gas (pressure not exceeding 250 lbs. per sq. in. at 115° F.)
(In column 2):
Inflammable gas.
Predominant components are generally propane, propylene, butanes (normal butane, or isobutane), butylenes, and butadiene.
Heavier than air.
Mixtures with air in certain proportions will be inflammable and explosive.
(In column 3): Red gas.
(In column 4):
Stowage:
"On deck protected."
"On deck under cover."
Containers:
Portable tanks (ICC–51) not over 8,000 lbs. gr. wt. (Fixed length dip tube gauging devices are not acceptable.)
(In column 5): Not permitted.
(In column 6): Not permitted.
(In column 7): Ferry stowage (BB).
Containers:
Portable tanks (ICC–51) not over 8,000 lbs. gr. wt. (Fixed length dip tube gauging devices are not acceptable.)
(In column 1):
Liquefied petroleum gas (pressure exceeding 250 lbs. per sq. in. at 115° F.)
NOTE: Gases with vapor pressure exceeding 250 lbs. per sq. in. at 115° F. shall be placed in tanks with design working pressure increased above 250 lbs. per sq. in. by increments of 62.5 lbs. per sq. in.
(In column 2):
Inflammable gas.
Predominant components are generally propane, propylene, butanes (normal butane, or isobutane), butylenes, and butadiene.
Heavier than air.
Mixtures with air in certain proportions will be inflammable and explosive.
(In column 3): Red gas.
(In column 4):
Stowage:
"On deck protected."
"On deck under cover."
Containers:
Portable tanks (ICC–51) not over 8,000 lbs. gr. wt. (Fixed length dip tube gauging devices are not acceptable.)
(In column 5): Not permitted.
(In column 6): Not permitted.
(In column 7):
Ferry stowage (BB).
Containers:
Portable tanks (ICC–51) not over 8,000 lbs. gr. wt. (Fixed length dip tube gauging devices are not acceptable.)

Subchapter Q—Specifications

PART 160—LIFESAVING EQUIPMENT

SUBPART 160.035—LIFEBOATS FOR MERCHANT VESSELS

Section 160.035–3 (w) (1) is amended to read as follows:

§ 160.035–3 *Construction of steel oar-propelled lifeboats.* * * *

(w) (1) Grab rails shall be substantially attached to each lifeboat below the turn of the bilge and extended approximately one-half of the length of the lifeboat on each side. The ends of the grab rails shall be faired to prevent fouling and all connections of the rails to the lifeboat shall be made by riveting the palms of the brackets to a small plate and riveting the plate to the shell. To prevent rupture of the shell if the grab rail is carried away, more rivets shall be used in attaching the plate to the shell than in fastening the bracket to the plate.

Dated: November 10, 1950.

[SEAL] A. C. RICHMOND,
Rear Admiral, U. S. Coast Guard, Acting Commandant.

[F. R. Doc. 50–10386; Filed, Nov. 16, 1950; 8:52 a. m., 15 F. R. 7835—11/17/50]

Navigation and Vessel Inspection Circular No. 7–50

UNITED STATES COAST GUARD,
WASHINGTON 25, D. C.,
November 21, 1950.

Subj: Externally operative disconnect switches.

1. A number of personal injury cases have been reported which point out the hazard of having disconnect switches mounted wholly within the inclosure. Since the operation of the disconnect switch can only be effected by physically grasping and moving the switch handle which is located beside energized electrical conductors or bare metal parts a very definite hazard is present. In the performance of disconnecting the switch, it is very possible for the hand, arm, or other portion of the body to come in contact with energized electrical conductors and bare metal parts.

2. The proper placement of disconnect switches should be so arranged as to be operative from outside the inclosure and so constructed that the pulling of the switch to deenergize the equipment will not be a hazard to the operator. The National Electrical Code provides: "Switches and circuit-breakers except pendant and service type snap switches and knife switches mounted on an open face switchboard or panel board shall be of the externally operable type inclosed in metal boxes or cabinets." This code inferentially prohibits the installation of any motor controller whose disconnect switch is not externally operative by stating that "disconnecting means shall be readily accessible." The provision for externally operative disconnect switches does not conflict with the requirements of the American Institute of Electrical Engineers Standard No. 45. Subsection 27.01 of this standard requires disconnect switches in waterproof inclosures to be externally operative. The Coast Guard follows the A. I. E. E. Standard No. 45 for electrical requirements on merchant vessels. While present requirements do not prohibit the placement of disconnect switches within nonwaterproof inclosures, action is being taken to prohibit such arrangements in future installations. Until this can be made a mandatory requirement, it is urged for safety of life at sea that immediate action be taken on existing vessels and new vessels to provide externally operative disconnect switches wherever possible.

3. While there may be many acceptable methods of accomplishing

this, one method which is considered suitable and safe is to provide for the operation of the disconnect switch by external means. Other methods will be considered satisfactory if they provide at least the same degree of safety as an externally operative disconnect switch.

(S) MERLIN O'NEILL,
Vice Admiral, U. S. Coast Guard,
Commandant.

Equipment Approved by the Commandant

APPROVAL OF EQUIPMENT; CHANGE IN NAME AND ADDRESS

[CGFR 50-34]

By virtue of the authority vested in me as Commandant, United States Coast Guard, by Treasury Department Order No. 120, dated July 31, 1950, and in compliance with the authorities cited below, the following approvals of equipment are prescribed and shall be effective for a period of five years from date of publication in the FEDERAL REGISTER unless sooner canceled or suspended by proper authority:

GAS MASKS, SELF-CONTAINED BREATHING APPARATUS, AND SUPPLIED-AIR RESPIRATORS

Approval No. 160.011/1/, MSA one-man combination fresh air hose mask, with all-vision facepiece assembly or with all-vision cleartone speaking diaphragm facepiece assembly which may be used in conjunction with the MSA Maskfone, Bureau of Mines Approval No. BM-1905A, MSA assembly dwg. No. A-1129-1 dated April 5, 1940, Rev. No. 4 dated August 29, 1950, manufactured by Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa. (Supersedes Approval No. 160.011/1/0 published in the FEDERAL REGISTER dated July 31, 1947.)

Approval No. 160.011/2/1, MSA two-man combination fresh air hose mask, with all-vision facepiece assembly or with all-vision cleartone speaking diaphragm facepiece assembly which may be used in conjunction with the MSA Maskfone, Bureau of Mines Approval No. BM-1905A, MSA assembly dwg. No. A-1129-1 dated April 5, 1940, Rev. No. 4 dated August 29, 1950, manufactured by Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa. (Supersedes Approval No. 160.011/2/0 published in the FEDERAL REGISTER dated July 31, 1947.)

Approval No. 160.011/12/1, MSA ammonia mask, with all-vision facepiece assembly or with all-vision cleartone speaking diaphragm facepiece assembly which may be used in conjunction with the MSA Maskfone, Bureau of Mines Approval No. BM-1406, MSA assembly dwg. No. A-1128-1 dated November 20, 1939, Rev. No. 10 dated August 29, 1950, manufactured by Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa. (Supersedes Approval No. 160.011/12/0 published in the FEDERAL REGISTER dated July 31, 1947.)

Approval No. 160.011/15/1, MSA Model "S" all-service gas mask, with all-vision facepiece assembly or with all-vision cleartone speaking diaphragm facepiece assembly which may be used in conjunction with the MSA Maskfone, Bureau of Mines Approval No. BM-1434, MSA assembly dwg. No. A-1128-1 dated Nov. 20, 1939, Rev. No. 10 dated August 29, 1950, manufactured by Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa. (Supersedes Approval No. 160.011/15/0 published in the FEDERAL REGISTER dated July 31, 1947.)

Approval No. 160.011/18/1, MSA standard all-service gas mask, with all-vision facepiece assembly or with all-vision cleartone speaking diaphragm facepiece assembly which may be used in conjunction with the MSA Maskfone, Bureau of Mines Approval No. BM-1405, MSA assembly dwg. No. A-1128-1 dated November 20, 1939, Rev. No. 10 dated August 29, 1950, manufactured by Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa. (Supersedes Approval No. 160.011/18/0, published in the FEDERAL REGISTER dated July 31, 1947.)

Approval No. 160.011/19/2 MSA "Chemox," 45-minute self-contained oxygen-generating breathing apparatus, with all-vision facepiece assembly or with all-vision cleartone speaking diaphragm facepiece assembly which may be used in conjunction with the MSA Maskfone, Bureau of Mines Approval No. BM-1307, MSA assembly dwg. No. A-1212-1 dated November 28, 1945, Rev. No. 13 dated August 30, 1950, manufactured by Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa. (Supersedes Approval No. 160.011/19/1 published in the FEDERAL REGISTER dated June 13, 1950.)

(R. S. 4417a, 4426, 49 Stat. 1544, 54 Stat. 1028, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 391a, 404, 463a, 50 U. S. C. 1275; 46 CFR 35.4-5, 61.16, 77.18, 95.17, 114.18, 160.011)

SIGNAL PISTOL

Approval No. 160.028/6/1, signal pistol, dwg. No. SP-150 dated March 5, 1950, manufactured by Signal Pyrotechnic Co., 4041 Whiteside St., Los Angeles, Calif. (Supersedes Approval No. 160.028/6/0 published in the FEDERAL REGISTER July 31, 1947.)

(R. S. 4405, 4417a, 4426, 4491, 49 Stat. 1544, 54 Stat. 346, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 404, 489, 1333, 50 U. S. C. 1275; 46 CFR 33.3-1, 33.3-2, 59.11, 76.14)

DAVITS, LIFEBOAT

Approval No. 160.032/120/0, mechanical davit, Quadrant Type Q30D, approved for maximum working load of 6,000 pounds per set (3,000 pounds per arm) using not less than 6-part falls, identified by general ar-

rangement dwg. No. 2372 dated September 15, 1942, and revised November 10, 1942, submitted by Welin Davit and Boat Division of Continental Copper and Steel Industries, Inc., Perth Amboy, N. J.

(R. S. 4405, 4417a, 4426, 4481, 4488, 4491, 49 Stat. 1544, 54 Stat. 346, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 404, 474, 481, 489, 1333, 50 U. S. C. 1275; 46 CFR 160.032)

LIFEBOAT

Approval No. 160.035/267/0, 12.0' x 4.42' x 1.92' steel, square stern, oar-propelled lifeboat, 6-person capacity, identified by construction and arrangement dwg. No. 3334 dated May 26, 1950, and revised September 14, 1950, manufactured by Welin Davit and Boat Division of Continental Copper and Steel Industries, Inc., Perth Amboy, N. J.

(R. S. 4405, 4417a, 4426, 4481, 4488, 4491, 4492, 35 Stat. 428, 49 Stat. 1544, 54 Stat. 346, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 396, 404, 474, 481, 489, 490, 1333, 50 U. S. C. 1275; 46 CFR 160.035)

IMPULSE-PROJECTED ROCKET TYPE LINE-THROWING APPLIANCE

Approval No. 160.040/1/0, Kilgore towline rocket appliance Model GR 52 CK, impulse-projected rocket type line-throwing appliance, rocket assembly dwg. No. KM 1901 dated November 28, 1949, Rev. No. 3 dated September 15, 1950, buoyant rocket assembly dwg. No. KM 1906 dated April 10, 1950, Rev. No. 1 dated September 15, 1950, cartridge assembly dwg. No. FXC–143 dated March 10, 1950, Rev. No. 1 dated June 19, 1950, appliance assembly dwg. No. KM 1911 dated November 28, 1949, Rev. No. 1 dated March 10, 1950, manufactured by The Kilgore Manufacturing Co., Westerville, Ohio.

(R. S. 4405, 4417a, 4426, 4488, 4491, sec. 11, 35 Stat. 428, 49 Stat. 1544, 54 Stat. 346, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 396, 481, 489, 1333, 50 U. S. C. 1275; 46 CFR 160.040)

BOILERS, HEATING

Hot water heating boilers, copper tube construction, 30 pounds per square inch maximum pressure, manual control, dwg. No. 6–1000–A dated August 17, 1950, manufactured by Allen Copper Coil Manufacturing, 400 East Pine St., Seattle 22, Wash., approved for the following model numbers:

Approval No.	Model	Water output B. t. u./hour
162.003/110/0	B–1	120,000
162.003/111/0	B–2	190,000
162.003/112/0	B–7	240,000
162.003/113/0	B–10	390,000
162.003/114/0	SH	90,000

(R. S. 4405, 4417a, 4418, 4426, 4433, 4434, 4491, 49 Stat. 1544, 54 Stat. 346, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 411, 412, 489, 1333, 50 U. S. C. 1275; 46 CFR Part 52)

GAS CONSUMING APPLIANCES, LIQUEFIED PETROLEUM

Approval No. 162.020/28/0, Magic Chef gas range, Model No. HD–10, approved by American Gas Association, Inc., under Certificate No. 11–22–5.901 for liquefied petroleum gas service, manufactured by American Stove Co., 4931 Daggett Ave., St. Louis 10, Mo.

Approval No. 162.020/29/0, Magic Chef gas range, Model No. HD–11, approved by American Gas Association, Inc., under Certificate No. 11–22–5.901 for liquefied petroleum gas service, manufactured by American Stove Co., 4931 Daggett Ave., St. Louis 10, Mo.

Approval No. 162.020/30/0, Magic Chef gas range, Model No. HD–16, approved by American Gas Association, Inc., under Certificate No. 11–22–5.901 for liquefied petroleum gas service, manufactured by American Stove Co., 4931 Daggett Ave., St. Louis 10, Mo.

Approval No. 162.020/31/0, Magic Chef gas deep fat fryer, Model No. 314–72, approved by the American Gas Association, Inc., under Certificate No. 13–9–1.011 for liquefied petroleum gas service, manufactured by American Stove Co., 4931 Daggett Ave., St. Louis 10, Mo.

Approval No. 162.020/32/0, Magic Chef gas deep fat fryer, Model No. 316–72, approved by the American Gas Association, Inc., under Certificate No. 13–9–1.011 for liquefied petroleum gas service, manufactured by American Stove Co., 4931 Daggett Ave., St. Louis 10, Mo.

Approval No. 162.020/33/0, Magic Chef gas deep fat fryer, Model No. 310–72, approved by the American Gas Association, Inc., under Certificate Nos. 13–9–1.011 and 13–9.1 for liquefied petroleum gas service, manufactured by American Stove Co., 4931 Daggett Ave., St. Louis 10, Mo.

Approval No. 162.020/34/0, Magic Chef gas deep fat fryer, Model No. 312–72, approved by the American Gas Association, Inc., under Certificate Nos. 13–9–1.011 and 13–9.1 for liquefied petroleum gas service, manufactured by American Stove Co., 4931 Daggett Ave., St. Louis 10, Mo.

(R. S. 4405, 4417a, 4426, 4491, 49 Stat. 1544, 54 Stat. 1028, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 404, 463a, 489, 1333, 50 U. S. C. 1275; 46 CFR 32.9–11, 61.25, 95.24, 114.25)

CHANGE IN NAME AND ADDRESS

The name and address of "Design Upholsterers, 1945 Spielbusch Ave., Toledo 2, Ohio," has been changed to "Auto Accesso Co., 2018 Jayne St., Toledo 9, Ohio," for Approval No. 160.007/29/0 (Buoyant cushions, kapok, standard), published in the FEDERAL REGISTER of July 31, 1947.

Dated: November 6, 1950.

[SEAL] A. C. RICHMOND,
Rear Admiral, U. S. Coast Guard,
Acting Commandant.

[F. R. Doc. 50–10142; Filed, Nov. 10, 1950; 8:51 a. m.]

TERMINATION OF APPROVAL OF EQUIPMENT

[CGFR 50–35]

By virtue of the authority vested in me as Commandant, United States Coast Guard, by Treasury Department Order No. 120, dated July 31, 1950, and in compliance with the authority cited below, the following approvals of equipment are terminated because the items of equipment covered are no longer being manufactured:

FLAME ARRESTERS FOR TANK VESSELS

Termination of Approval No. 162.-016/1/0, Type O, Staytite flame arrester, cast iron body and aluminum perforated plate arrester bank, atmospheric pattern, vent outlet opens directly to atmosphere, marked "Staytite" with pipe size cast on body, approved for 4", 6", 8", and 10" pipe sizes for use with inflammable or combustible liquids of Grade A or lower, manufactured by Staytite Co., Houston, Texas. (Approved FEDERAL REGISTER July 31, 1947.)

Termination of Approval No. 162.-016/2/0, Type I, Staytite flame arrester, cast iron body and aluminum perforated plate bank, enclosed pattern, marked "Staytite" with pipe size cast on body, approved for 4", 6", and 8" pipe sizes for use with inflammable or combustible liquids of Grade A or lower, manufactured by Staytite Co.,

Houston, Texas. (Approved FEDERAL REGISTER, July 31, 1947.)

(R. S. 4417a and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 391a, 50 U. S. C. 1275; 46 CFR 30.3)

VALVES, PRESSURE VACUUM RELIEF

Termination of Approval No. 162.017/26/0, Staytite type E pressure vacuum relief valve, conservation vent, weight and spring loaded, atmospheric pattern, standard and high pressure valve settings, high pressure valve (1.0 p. s. i.) fitted with phosphor bronze spring, cast iron body and aluminum alloy cages, seats and valves, dwg. No. 30 "Conservation vent assembly" dated May 18, 1937, approved for 3" and 4" pipe sizes for use with inflammable or combustible liquids where flame arresters are not required, manufactured by The Staytite Co., Houston, Texas. (Approved FEDERAL REGISTER July 31, 1947.)

Termination of Approval No. 162.017/27/0, Staytite type "Valtor" pressure vacuum relief valve, combination vent valve flame arrester and snuffer, weight and spring loaded atmospheric pattern, standard and high pressure valve settings, high pressure valve (1.0 p. s. i.) fitted with phosphor bronze spring, cast iron body and aluminum alloy cages, seats and valves, aluminum flame arrester plate bank, dwg. Nos. 12, 16, 25, 28, and 35, marked "Staytite Valtor" with pipe size cast in body, approved for 3" and 4" pipe sizes, for use with inflammable or combustible liquids of Grade A or lower, manufactured by The Staytite Co., Houston, Texas. (Approved FEDERAL REGISTER July 31, 1947.)

(R. S. 4405, 4417a, 4491, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 375, 391a, 489, 50 U. S. C. 1275; 46 CFR 32.7–4)

CONDITIONS OF TERMINATION OF APPROVALS

The termination of approvals of equipment made by this document shall be made effective upon the thirty-first day after the date of publication of this document in the FEDERAL REGISTER. Notwithstanding this termination of approval on any item of equipment, such equipment manufactured before the effective date of termination of approval may be used on merchant vessels so long as it is in good and serviceable condition.

Dated: November 6, 1950.

[SEAL] A. C. RICHMOND,
Rear Admiral, U. S. Coast Guard,
Acting Commandant.

[F. R. Doc. 50-10143; Filed, Nov. 10, 1950; 8:51 a. m., 15 F. R. 7691—11/11/50]

The following list supplements that published by the United States Coast Guard under date of May 15, 1943, entitled "Miscellaneous Electrical Equipment Satisfactory for Use on Merchant Vessels," as well as subsequently published lists and is for the use of Coast Guard personnel in their work of inspecting merchant vessels. Other electrical items not contained in this pamphlet and subsequent listings may also be satisfactory for marine use, but should not be so considered until the item is examined and listed by Coast Guard Headquarters. Before listings of electrical appliances are made it is necessary for the manufacturer to submit to the Commandant (MMT), United States Coast Guard Headquarters, Washington 25, D. C., duplicate copies of a detailed assembly drawing, including a material list with finishes of each corrosive part of each item.

Manufacturer and description of equipment	*Location apparatus may be used				Date of action
	Passenger and crew quarters and public spaces	Machinery, cargo, and work spaces	Open decks	Pump rooms of tank vessels	
Cargocaire Engineering Corp., New York, N. Y.:					
Gear case dehumidifier, model U-10-1.25, dwgs. nos. 4351-E, alt. 1, 4385-C, alt. 0, 12043-C, alt. 0 & 1935-B, alt. 0	X	X			10-23-50
The Carlisle & Finch Co., Cincinnati, Ohio:					
Searchlight, 19", wheel control, turntable base, 1,000 watts, 120 volts, waterproof, dwg. no. 2306, alt. 2	X	X	X		9-19-50
The Electric Tachometer Corp., Philadelphia, Pa.:					
Shaft revolution indicator, type IC-2FSG, without illumination, dwg. no. 1555, alt. 1	X	X			11-22-50
Federal Enterprises, Inc., Chicago, Ill.:					
Vibratory horn, type 30, waterproof, 6, 12, 16, 24, 32, 48, 115, 220, and 250 volts, a. c., dwg. no. H-7152, rev. A	X	X			9-19-50
Vibratory horn, type 30A, waterproof, 6, 12, 16, 24, 32, 48, 115, 220, and 250 volts, a. c., dwg. H-6792, rev. A	X	X			9-19-50
Vibratory horn, type 50, waterproof, 6, 12, 16, 24, 32, 48, 115, 220, and 250, volts, a. c., dwg. no. H-7465, rev. A	X	X			9-19-50
Henschel Corp., Amesbury, Mass.:					
Vibrating bells and buzzer, 3", 4", 6", and 8", a. c. and d. c. fused (for installation above bulkhead deck only), waterproof, dwg. no. 20-162-F, alt. 0	X	X	X		10-21-50
Vibrating bells and buzzer, 6", 8", 10", and 12", a. c. and d.c., fused (for installation above bulkhead deck only), waterproof, dwg. no. 20-163-F, alt. 0	X	X	X		10-21-50
Murlin Manufacturing Co., Philadelphia, Pa.:					
Exit marker sign fixture, single face, nonwatertight, 2 25-watt lamps max., dwg. no. 306-A, alt. 0	X				9-19-50
Pilot Marine Corp., New York, N. Y.:					
Salinity indicator panel, model SNA-5, electrical schematic diagram dwg. no. PM-1147, rev. 3	X	X			10-24-50
Salinity indicator panel, model SNA-7, electrical schematic diagram dwg. no. PM-1386, rev. 3	X	X			10-24-50
Standard Switchboard Co., Brooklyn, N. Y.:					
Distribution panels for power or lighting; type 2VS-2W, 2/2W 125V or 250V, a. c. or d. c.; type 2VS-3W, 3/2W 125/250V a. c. or d. c.; type 3VS-3W, 3/3W, 250V max.; 42 overload devices max., 30A, 60A, 100A, and 200A branches, drippproof, dwg. no. CG-150, alt. 0	X	X			9-21-50

WELDING ELECTRODES

The following types of electrodes have been tested in accordance with the requirements of ASTM designation A233—48T for mild steel arc-welding electrodes in the presence of an American Bureau of Shipping Surveyor and the test reports indicate that the requirements were met.

A. O. Smith Corp., Milwaukee 1, Wis., *A. O. Smith Corp.* (manufacturer), SW-14, Type E 6011.

OPERATING POSITIONS AND ELECTRODE SIZES

The Type E 6011 $\frac{3}{32}$", $\frac{1}{8}$", $\frac{5}{32}$" and $\frac{3}{16}$" diameter electrodes will be allowed for all position welding on alternating and direct current. The $\frac{7}{32}$" and $\frac{1}{4}$" diameter electrodes will be allowed for horizontal fillet and flat position welding on alternating and direct current. (Not stress relieved.)

Air Reduction Sales Co., 42d Street, opposite Grand Central, New York 17, N. Y.· *Arcrods Corp.* (Manufacturer), Airco 230, Type E 6011.

OPERATING POSITIONS AND ELECTRODE SIZES

The Type E 6011 $\frac{1}{16}$", $\frac{3}{32}$", $\frac{1}{8}$", $\frac{5}{32}$", and $\frac{3}{16}$" diameter electrodes will be allowed for all position welding on alternating and direct current. The $\frac{7}{32}$" and $\frac{1}{4}$" diameter electrodes will be allowed for horizontal fillet and flat

position welding on alternating and direct current. The 5/16" diameter electrodes will be allowed for flat position welding on alternating and direct current.

General Electric Co., Schenectady, N. Y., *Arcrods Corp.* (Manufacturer). GE W-26, Type E 6011.

Operating Positions and Electrode Sizes

The Type E 6011 1/16", 3/32", 1/8", 5/32", and 3/16" diameter electrodes will be allowed for all position welding on alternating and direct current. The 7/32" and 1/4" diameter electrodes will be allowed for horizontal fillet and flat position welding on alternating and direct current. The 5/16" diameter electrode will be allowed for flat position welding on alternating and direct current.

Metal and Thermit Corp., 120 Broadway, New York 5, N. Y., *Arcrods Corp.* (Manufacturer). Murex, Type A E 6011.

Operating Positions and Electrode Sizes

The Type A E 6011 1/16", 3/32", 1/8", 5/32", and 3/16" diameter electrodes will be allowed for all position welding on alternating and direct current. The 7/32" and 1/4" diameter electrodes will be allowed for horizontal fillet and flat position welding on alternating and direct current. The 5/16" diameter electrode will be allowed for flat position welding on alternating and direct current.

Wilson Welder and Metals Co., Inc., Lincoln Building, 42d Street and Grand Central, New York 17, N. Y., *Arcrods Corp.* (Manufacturer). Wilson 530, Type E6011.

Operating Positions and Electrode Sizes

The Type E6011 1/16", 3/32", 1/8", 5/32", and 3/16" diameter electrodes will be allowed for all position welding on alternating and direct current. The 7/32" and 1/4" diameter electrodes will be allowed for horizontal fillet and flat position welding on alternating and direct current. The 5/16" diameter electrode will be allowed for flat position welding on alternating and direct current.

Correction

In the September 1950, "Proceedings" on page 146 the Types E6020 and E6012 electrodes of the Lincoln Electric Co. were listed as Fleetwood 11 and Fleetwood 72 in error. It should have read as follows:

Lincoln Electric Co., 12818 Coit Road, Cleveland 1, Ohio, *Lincoln Electric Co.* (manufacturer), Fleetweld 11, Type E6020, and Fleetweld 72, Type E6012.

PUBLICATIONS RELEASED

Explosives or Other Dangerous Articles on Board Vessels—CG 187:

These regulations replace the publication entitled "Explosives or Other Dangerous Articles on Board Vessels," dated April 9, 1941, as revised July 1, 1947, and "Amendment Sheets to Explosives or Other Dangerous Articles on Board Vessels," distributed June 1, 1949. This edition contains all the amendments to the regulations promulgated and published in the Federal Register between April 9, 1941, and July 17, 1950. The changes published in the Federal Register since the Amendment Sheets were distributed June 1, 1949, are contained in Federal Register Document CGFR 49-43 which was published January 11, 1950, in the Federal Register. Section 146.04-5 was amended by deleting the articles "iron oxide," "iron sponge", and "iron sponge, spent," and inserting the articles "iron mass, spent," "iron mass, wet," and "iron oxide, wet," "iron sponge not properly oxidized," "iron sponge, spent," "iron sponge, wet," and "spent oxide." Section 146.09-6, regarding portable magazine chest was completely revised. Table E-Classification: Inflammable Solids and Oxidizing Materials in section 146.22-100 was amended by adding requirements regarding "iron sponge not properly oxidized," "iron mass, spent," "iron sponge, spent," and "spent oxide" and the shipping requirements for "pyroxylin plastics, rods, rolls, sheets, or tubes," and "film support (nitrocellulose base)" were amended. Paragraph 146.23-10 (b) was amended by adding a new subparagraph (6) providing special approval of the Commandant to allow the discharging of sulfuric acid in bulk at a pressure of more than 30 pounds per square inch. Section 146.24-15 was amended by changing paragraphs (a) and (1) regarding liquid chlorine in bulk and its transportation with liquid caustic soda. Table K—Classification: Hazardous Articles in section 146.27-100 was amended by deleting requirements for "iron sponge (iron oxide)," and "iron sponge, spent," and new requirements were added for "iron mass, wet"; "iron sponge, wet"; and "iron oxide, wet." Editorial changes in sections 146.03-36 (c) (2), 146.04-5, 146.21-100, and 146.24-100 were also published in the Federal Register, July 15, 1950, as a part of Federal Register Document CGFR 50-16. The publication is reprinted at this time because the supply of the basic edition is exhausted. There were no amendment sheets distributed containing only the changes published January 11, and July 15, 1950.

Manual for Lifeboatmen and Able Seamen, Qualified Members of Engine Department, and Tankermen—CG 175:

This booklet was formerly known as the "Manual for Lifeboatmen and Able Seamen." It has now been revised to include the requirements for Qualified Members of the Engine Department and for Tankermen in addition to those for Lifeboatmen and Able Seamen, and it also contains the safety practices which are standard for those ratings. All the procedures and practices and descriptions set forth have been changed to comply with the latest information available. The Eve method of applying artificial respiration has been included along with information of fire fighting and such highly efficient equipment as the all-purpose hose nozzle. The safety hints and precautions are the result of studies of casualties aboard ship, most of which resulted in injury or death of one or more persons.

1949 Edition Code of Federal Regulations Title 33—Navigation and Navigable Waters:

This Pocket Supplement contains in full text the changes and additions to Title 33 of the Code of Federal Regulations, 1949 Edition, which were published in the Federal Register during 1949 and which were in force and effect on December 31, 1949.

All documents directly affecting Title 33 are tabulated in the "List of Sections Affected" appearing at the end of this Pocket Supplement.

1949 Edition Code of Federal Regulations Title 46—Shipping Parts 1 to 145:

This Pocket Supplement contains in full text the changes and additions to Parts 1 to 145 of Title 46 of the Code of Federal Regulations, 1949 Edition, which were published in the Federal Register during 1949 and which were in force and effect on December 31, 1949.

All documents directly affecting Parts 1 to 145 of Title 46 are tabulated in the "List of Sections Affected" appearing at the end of this Pocket Supplement.

1949 Edition Code of Federal Regulations Title 46—Shipping Parts 146 to end:

This Pocket Supplement contains in full text the changes and additions to Parts 146 to end of Title 46 of the Code of Federal Regulations, 1949 Edition, which were published in the Federal Register during 1949 and which were in force and effect on December 31, 1949.

All documents directly affecting Part 146 to end of Title 46 are tabulated in the "List of Sections Affected" appearing at the end of this Pocket Supplement.

Amendatory documents which were promulgated during any part of this period, but which were not in effect on December 31, are not carried in full text. Citations to such documents are carried in notes entitled "Prior Amendments."

Dates appearing in citations of source are dates of publication in the Federal Register, and should not be construed as effective dates.

This Pocket Supplement was compiled and edited by the Division of the Federal Register, National Archives and Records Service, General Services Administration.

FUSIBLE PLUGS

The Marine Engineering Regulations and Material Specifications require that manufacturers submit samples from each heat of fusible plugs to the Commandant 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 October 15 to November 15, 1950, is as follows:

The Lunkenheimer Co., P. O. Box 360 Annex Station, Cincinnati 14, Ohio. Heats Nos. 368 through 376.

M. Greenberg's Sons, 765 Folsom Street, San Francisco, Calif. Heat No. 163.

H. B. Sherman Manufacturing Co., 22 Barney Street, Battle Creek, Mich. Heat No. 708.

CORRECTION

In the appendix section of the September issue the listing of fusible plugs should have included heat numbers 362 and 363 for the Lunkenheimer Co., Post Office Box 360, Annex Station, Cincinnati 14, Ohio, in addition to those already published.

AFFIDAVITS

The following affidavits were accepted from October 15 to November 15, 1950:

Boston Electro Steel Casting, Inc., 53 Gerard and Island Streets, Boston 19, Mass. Casting.

Cameron Iron Works, Inc., P. O. Box 1212, Houston, Tex. Valves and Bolting.

Newport News Shipbuilding & Dry Dock Co., Newport News, Va. Flanges, Castings, Forgings, and Bolting.

General Controls Co., 801 Allen Avenue, Glendale 1, Calif. Valves and Fittings.

Maryland Dry Dock Co., Baltimore, Md. Valves.

ARTICLES OF SHIPS' STORES AND SUPPLIES

Articles of ships' stores and supplies certificated from 26 October to 25 November 1950, 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:

Currier Co., 205 Twelfth Street, Oakland 4, Calif., Certificate No. 321, dated 2 November 1950. "Coldkleen."

S. C. Johnson & Son, Inc., Racine, Wis., Certificate No. 322, dated 8 November 1950. "No buff floor finish (brown label)."

S. C. Johnson & Son, Inc., Racine, Wis., Certificate No. 323, dated 8 November 1950, "No buff floor finish (green label)".

Klix Chemical Co., 2460 Third Street, San Francisco 7, Calif., Certificate No. 324, dated 13 November 1950. "Klix marine insect spray."

Merchant Marine Personnel Statistics

MERCHANT MARINE LICENSES ISSUED DURING OCTOBER 1950

DECK OFFICERS

		Region								Total	
		Atlantic coast		Gulf coast		Great Lakes and rivers		Pacific coast			
		O	R	O	R	O	R	O	R	O	R
Master	Ocean	16	91	5	23	2	9	2	40	25	163
	Coastwise	1	11	0	3	0	0	0	1	1	15
	Great Lakes	0	0	0	0	0	3	0	0	0	3
	B. S. & L.	5	49	2	2	1	0	1	4	9	55
	Rivers	1	4	2	9	1	11	0	0	4	24
Chief mate	Ocean	17	39	7	5	3	1	1	25	28	79
	Coastwise	0	1	0	0	0	0	1	3	1	4
Second mate	Ocean	18	42	5	11	0	12	3	25	26	90
	Coastwise	0	0	0	0	0	0	0	0	0	0
Third mate	Ocean	23	47	2	8	3	15	5	16	33	86
	Coastwise	0	0	0	0	0	0	0	0	0	0
Mate	Great Lakes	0	0	0	0	0	0	0	0	0	0
	B. S. & L.	0	4	1	0	0	0	4	3	5	7
	Rivers	0	1	0	0	12	6	0	0	12	7
Pilots	B. S. L. & R.	72	135	16	35	40	28	8	37	136	235
Master	Uninspected vessels	0	0	0	0	1	6	0	2	1	8
Mate	Uninspected vessels	1	2	0	0	0	0	0	0	1	2
Total		154	426	40	96	63	91	25	156	282	769
Grand total		580		136		154		181		1,051	

ENGINEER OFFICERS

Steam	Chief engineer: Unlimited	17	167	4	37	2	20	6	58	29	222
	Chief engineer: Limited	5	46	1	4	0	20	0	5	6	75
	First assistant engineer: Unlimited	13	53	7	6	2	9	5	15	27	83
	First assistant engineer: Limited	0	1	0	2	0	4	1	1	1	8
	Second assistant engineer: Unlimited	21	64	4	7	1	23	4	31	30	125
	Second assistant engineer: Limited	0	0	0	0	0	0	0	1	0	1
	Third assistant engineer: Unlimited	50	74	9	16	4	48	6	25	69	163
	Third assistant engineer: Limited	0	0	0	0	0	0	0	0	0	0
Motor	Chief engineer: Unlimited	6	25	0	3	0	6	3	16	9	50
	Chief engineer: Limited	10	29	9	8	3	6	3	11	25	54
	First assistant engineer: Unlimited	0	5	0	1	0	1	0	0	0	7
	First assistant engineer: Limited	6	2	2	0	4	0	0	0	12	2
	Second assistant engineer: Unlimited	2	3	0	1	0	3	0	2	2	9
	Second assistant engineer: Limited	0	0	0	1	1	1	0	0	1	2
	Third assistant engineer: Unlimited	32	71	1	13	2	51	0	33	35	168
	Third assistant engineer: Limited	0	0	0	0	0	0	0	0	0	0
Uninspected vessels	Chief engineer	1	1	0	0	3	2	0	0	4	3
	Assistant engineer	1	1	0	0	3	0	0	0	4	1
Total		164	482	37	99	25	194	28	198	254	973
Grand total		646		136		219		226		1,227	

RADIO OFFICERS

Total	28

ORIGINAL SEAMEN'S DOCUMENTS ISSUED MONTH OF OCTOBER 1950

Region	(1) Staff officer	(2) Continuous discharge book	(3) U. S. merchant mariner's documents	(4) AB any waters unlimited	(5) AB any waters 12 months	(6) AB Great Lakes 18 months	(7) AB tugs and towboats any waters	(8) AB bays and sounds [1]	(9) AB seagoing barges	(10) Lifeboatman	(11) Q. M. E. D.	(12) Radio operators	(13) Certificate of service	(14) Tankerman
Atlantic coast	41	7	609	111	49	2	.....	.....	1	91	90	1	496	9
Gulf coast	5	14	236	28	10	1	.....	.....	1	8	36	1	209	4 23
Pacific coast	23	1	432	41	24	.....	.....	.....	.....	29	44	.....	409	4
Great Lakes and rivers	.....	2	773	20	78	34	.....	.....	.....	22	110	.....	723	30
Total	69	24	2,050	200	161	37	0	0	2	150	280	2	1,837	66

[1] 12 months, vessels 500 gross tons or under not carrying passengers.

NOTE.—Columns 4 through 14 indicate endorsements made on United States merchant mariner's documents.

INVESTIGATING UNITS

Coast Guard Merchant Marine Investigating Units and Merchant Marine Details investigated a total of 719 cases during the month of October 1950. From this number, charges were filed with the Civilian Hearing Examiners involving 15 officers and 69 unlicensed men. As a result of said hearings, in the case of officers, no licenses were revoked, 2 were suspended, 11 were suspended with probation granted, none were voluntarily surrendered, 5 cases were dismissed after hearing and 3 hearings were closed with an admonition. Of the unlicensed personnel, 8 certificates were revoked, 18 were suspended, 22 were suspended with probation granted, 22 were voluntarily surrendered, 3 were closed with an admonition, and 16 were dismissed after hearing.

In lifting heavy weights, face the object, keep your feet close to it, and space them 8 to 12 inches apart.

Carry loads on the shoulders where possible rather than on the hips.

Don't reach too high for heavy packages.

Lift from the floor with knees bent, using leg rather than back muscles.

Use mechanical devices where you can—conveyor belts, elevators, hoists.

ANNUAL INDEX—VOLUME 7

ANNUAL INDEX—VOLUME 7—Continued

ACRYLONITRILE

DANGER! FLAMMABLE POISON

Do not breathe vapor.

Do not get in eyes, on skin, on clothing.

Use with adequate ventilation.

Keep away from heat and open flame.

Keep container closed.

 **POISON** 

FIRST AID TREATMENT

Carry patient to fresh air. Have him lie down. Remove contaminated clothing but keep patient warm. Start the following first aid treatment immediately and CALL A PHYSICIAN.

If patient is conscious and breathing:

(1) Break an amyl nitrite pearl in a cloth and hold lightly over the nose for not more than 15-20 seconds. Repeat every 5 minutes for 25 minutes if recovery is not forthcoming.

(2) If this product has been SWALLOWED, give patient one pint of 1% Sodium Thiosulfate solution (or soapy water or mustard water) by mouth every 15 minutes until vomiting occurs.

If patient has stopped breathing:

Give artificial respiration until breathing starts. Break an amyl nitrite pearl in a cloth and hold lightly over nose for not more than 20 seconds, repeating every 5 minutes for 25 minutes or until breathing starts.

If patient is unconscious but breathing:

Break an amyl nitrite pearl in a cloth and hold lightly over nose for not more than 20 seconds, repeating every 5 minutes for 25 minutes if recovery is not forthcoming. Give oxygen from an inhalator.

NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IN ALL CASES KEEP PATIENT QUIET AND WARM UNTIL A PHYSICIAN ARRIVES.

U. S. GOVERNMENT PRINTING OFFICE: 1950