PROCEEDINGS OF THE
MERCHANT MARINE COUNCIL
UNITED STATES COAST GUARD

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The
Merchant Marine Council
of the United States
Coast Guard

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AUTOMATIC SPRINKLING SYSTEMS

"FIRE! FIRE!" is a call we don't like to hear and, fortunately, does not happen too often. However, the call "turn off the sprinkler system" has happened quite often when the heads are fused or damaged. Therefore, it is essential for the safety of the ship that personnel be familiar with the operation of the automatic sprinkling system and be able to reset it after it has been in operation.

This article has been prepared primarily for the purpose of providing useful information for those in charge of the care and maintenance of all types of overhead water-sprinkling systems and to bring as forcibly as possible to the attention of shipowners, certain information which it is hoped will be of assistance to those in charge of operating and maintaining sprinkler equipment at its highest point of efficiency.

The automatic sprinkler systems, as we know them today, are by no means new devices used for fire protection or a fire-extinguishing medium. Their history and record of accomplishment are of more than ordinary interest, a review of which time and space will not permit. However, it is safe to say that for the past 50 years or more sprinkler systems have extinguished thousands upon thousands of small fires which otherwise would have developed into serious losses. The forerunners of the automatic sprinkler were the perforated pipe and the open head sprinkler which still will be found installed on automobile and passenger ferryboats. The perforated pipe system, as its name implies, is simply a series of perforated pipes attached to the ceiling and divided into sections arranged to entirely cover or blanket the deck, each fed by a main pipe or riser and controlled by a stop valve generally located outside of the space covered. Next came the open head sprinkler. These systems were divided into sections and controlled by outside valves, the same as the perforated pipe system. Based on long and extensive experience and tests, the automatic system was developed as its name implies.

The automatic sprinkling system is a device for automatically distributing water upon a fire in sufficient quantities either to extinguish it entirely or hold it in check. Water is fed through the system of piping to the sprinkler heads placed at intervals along the pipe. The more popular approved type sprinkler head embodies an opening which is normally closed by a disk or cap, held in place by a metal strut or lever held together with a fusible solder. The sprinkler operates when the surrounding air temperature is sufficient to melt the solder link. In the bulb type, the arrangement consists of a small bulb nearly filled with a liquid which expands with heat and shatters the bulb releasing the valve cap assembly.

There are two types of automatic sprinkler systems generally used on merchant vessels. They are the dry-

pipe and wet-pipe systems. The dry-pipe system is one in which the pipes contain air under pressure instead of water. It is so arranged that when a sprinkler head is fused, the air escapes and water under pressure is admitted automatically by the operation of the dry-pipe valve. After the valve operates, the sprinkler equipment functions as a regular wet-pipe system.

A wet-pipe system is one in which the entire system is filled with water under pressure. The water is at the sprinkler head at all times ready for release as soon as the sprinkler head is fused.

The valve in the dry-pipe system is the differential type having two clappers of unequal size so assembled that the large clapper, subject to air pressure, holds to its seat the smaller clapper which shuts out the water supply. The trip point is determined by the ratio of the area of one clapper to that of the other. The ordinary ratio of water to air pressure is about 6 to 1. Connected directly to the system is a pressure tank.

In automatic water-sprinkling systems on board vessels navigating on salt waters, a pneumatic tank is provided holding approximately 750 to 1,000 gallons of fresh water. This water under air pressure is available for immediate use while automatic pump gets into operation. By the use of fresh water, it is also possible to prevent serious salt-water corrosion in the piping and the system can be normally cut off in cases where heads are accidently fused or damaged before the fresh-water tank is entirely expended. On vessels navigating on fresh water, tanks are sometimes omitted. When used the tank should always be kept about two-thirds full of water and the other third of the tank constantly filled with compressed air supplied by an air compressor, providing the primary source of water supply for the system is an automatically controlled pressure pump with suction connected directly to sea valve and discharging directly to the pressure tank or dry-valve manifold. The pump control should be so arranged that when the air pressure in the system is reduced or released, the governor is activated causing the pump to start and discharge sea water into the system.

Water-flow switches are generally installed at or near the base of each zone sprinkler riser. These devices have a flexible vane or paddle in the waterway, the movement of which closes or opens an electric circuit causing alarm bells to ring in the pilothouse and engine room and a dial-drop in the annunciator cabinet indicates the zone affected.

Since December 31, 1916, inspection laws of the United States and the regulations promulgated thereunder, require that all steamers carrying passengers and which also carry freight upon the main deck which is accessible to passengers or crew while being navigated, shall have installed on such main deck freight space an efficient overhead water-sprinkling system. Sprinkling systems were also required in certain passenger and crew spaces and galleys located below the main deck. Therefore, it can be readily seen that sprinkler systems are not a new fire-extinguishing device on board our merchant vessels. Congress later required the installation of automatic sprinkler systems on certain passenger ships, the requirements for which will be found in the General Rules and Regulations.

For the past 2½ years, inspectors' reports and Coast Guard records reveal the fact that water-sprinkling systems are too often neglected after they are once installed. The inspectors have noted on many vessels that the engineers and responsible persons give careful attention to the performance and operation of boilers and related machinery but almost forget that there is a water-sprinkling system on board and do not give it the necessary attention. This does not mean that a sprinkler system is a complicated apparatus or that it requires more attention than other equipment of equal importance. While operation and maintenance should be one undertaking, a consideration of each, individually, is made here for information purposes. Even so, it will be apparent that no absolute distinction exists between operation and maintenance as the one depends upon the other. Also, it is common knowledge that manufacturers' instruction books provide specific operation and maintenance procedures which should always be followed.

The records of the inspectors making shipboard examinations and tests of water-sprinkling systems indicate some serious defects which would prevent satisfactory operation of the equipment. No better method of conveying general information regarding the care and maintenance of water-sprinkling systems can be used than by referring to the defects found by the inspectors making actual tests and examination of the equipment on various vessels.

Let's consider first the examination and test conducted on the S. S. ———. This vessel is equipped with a three-zone dry-pipe automatic sprinkler system. The electric alarm bell system was first tested by releasing the air pressure on each zone and in each case the bells and annunciator functioned properly. This system was provided with the necessary valves to conduct the test without flooding the sprinkler pipes, yet simulating the fusing of a sprinkler head. Further examination of the system disclosed that provisions had not been provided for testing the water supply pump. Heretofore, the method used in testing this pump was by simply tripping the pressure control valve momentarily and observing that the steam centrifugal pump revolved for a few seconds. This only demonstrated that the pump would operate but did not show whether water was being pumped. Not satisfied with this method of testing the performance of the pump, the inspectors requested that a pipe connection be installed in the discharge line between the manifold and pump to permit a free discharge of water into the bilge. After installation of this connection, the pump was started and a small quantity of water discharged at first, then the flow stopped entirely. It was then observed that the pump was running hot, but no water was being pumped. The pump was immediately stopped and further examination revealed a section of the suction pipe was completely plugged with mud and sediment. This condition alone represented carelessness and faulty maintenance in its most glaring form. It further indicated failure to properly test the system to insure its functioning in case of emergency. Had a fire occurred on the vessel under this situation, although other pumps could be made to operate on the system, it is obvious that valuable initial time would have been lost in getting the cold pumps operating, consequently permitting possible serious fire damage or complete destruction of the vessel.

Another interesting case is that of the S. S. ———. This vessel is equipped with a wet-pipe automatic sprinkler system consisting of three separate zones. The sprinkler electric alarm bell system was tested from each zone by releasing pressure, and found in satisfactory operating condition. The inspectors then requested that the proper valves be closed and/or opened in order that the water supply pump be operated at near capacity discharging water either in the bilges or overboard. At this point it developed that the engineering personnel were not sufficiently familiar with the various valves to accomplish this test, stating that, heretofore, the only test conducted, or witnessed by them was the checking of the alarm bells. An examination of the piping arrangement soon revealed that two other pressure pumps could be lined up to operate on the sprinkler system, and also that all three pumps could

be lined up to discharge into the fire main, thence through fire hose and overboard. Each pump was tested separately in this manner and observed to discharge sufficient volume of water at a satisfactory pressure. Although the inspectors found this sprinkler system in good operating condition, the lack of familiarity with the operating principles of the apparatus, on the part of the engine room personnel, represented carelessness and inattention to duty. It is difficult to believe that such conditions could exist, but they do. The inspectors found it necessary to check over the entire system and then instructed and advised the ship's engineers in operating and testing the system which had been installed in the ship for at least 12 years.

Another case worthy of mention in order that conscientious engineers may direct it to the attention of responsible persons who are inclined to be lax in such matters, is that of the S. S. ———. This vessel is equipped with a dry-pipe automatic sprinkling system, divided into three zones. Test and examination of the system was conducted in the following manner: Water supply valves were closed, water supply pump and air compressor secured, air pressure on system released and system drained. Dry valves were opened, examined, and found in satisfactory condition. Sprinkler heads were removed at various locations in the three zones. The sprinkler piping was found plugged completely with rust and sediment at two places where side wall sprinkling heads were removed. The plugged pipes were cleaned and the system put in service operation after which further tests were conducted by fusing a sprinkler head at different locations in each zone. Although a sufficient quantity of water was observed to flow from each fused head, the test was not satisfactory because the sprinkler alarm bells and the annunciator indicators did not function. The condition "plugged pipes" mentioned above, is most frequently found by the inspectors when inspecting perforated pipe manually operated type systems which are generally installed on passenger and automobile ferryboats. The inspectors' reports indicate that on practically all vessels of this type, at least one or more sections of perforated sprinkling pipe was found partly or completely plugged with accumulation of sediment and rust.

The whole story in connection with the inspection of sprinkling systems and the deficiencies noted as revealed in the records, which are directly attributed to careless operation or inadequate maintenance, cannot be set forth in this article. The following recommended practices are suggested, which if adhered to, will assist in maintaining all types of sprinkler systems in efficient operating condition:

(*a*) *Plugged systems.*—Corrosion and sediment are factors to which special attention must be given. These factors may have serious effect on the operation of the heads. If this is lost sight of, the equipment may give trouble or, if called upon to extinguish a fire, may be found sluggish in action or wholly inoperative. At least once each year, preferably while the vessel is undergoing annual inspection, a sufficient number of heads should be removed, examined, and cleaned to assure proper operation of the system, piping examined and entire piping system washed out if found necessary.

(*b*) *Painting.*—The inspectors have noted that the sprinkler heads on a number of vessels have been entirely painted over, which either prevents proper operation or makes them slow to operate. In order to insure maximum sensitivity, neither the "solder type" heads nor the "bulb type" heads should ever be painted. There should be absolutely no paint or coating of any kind applied on any part of a sprinkler head after it is received from the manufacturer.

(*c*) *Sprinkler heads used for other purposes.*—Clothing hangers or miscellaneous articles should never be permitted to hang from sprinkler heads or any part of the sprinkler piping. This practice will not only damage the head, but will, in case of emergency, prevent the water from being sprayed over the intended area.

(*d*) *Pump.*—The sprinkler pumps should be run for a few minutes at least once each week until water is discharged at approximately full speed and pressure. In these tests, the water should be discharged through an outlet in the piping provided for discharge into the bilges or overboard. During this test, make sure that the suction pipe and strainers, the pump, and the discharge to the sprinkler main are clear and in proper operating condition. Care should be exercised to prevent salting up the piping system.

(*e*) *Electric alarms.*—The electric-alarm system should be periodically tested to ascertain if it is in good working order. The sprinkler alarm may be tested on all automatic systems by means of valves provided to release the pressure for test purposes.

(*f*) *Dry valves.*—Since water from condensation settles to the low points of the system, it will leave an accumulation of sediment in and around the seat of the dry valves. For this reason, the dry valves should be opened occasionally to expel any such accumulation, valves cleaned, and all necessary repairs made to assure good operation.

(*g*) *Repairs.*—In order to insure having an efficient water-sprinkling system ready and operable at all times, all necessary repairs should be made promptly.

The operating engineers and inspectors should use caution when testing sprinkler systems. They should carefully follow the sequence of instructions for testing covering the particular type of sprinkler system installed on the ship. It is of utmost importance that all valves and pumps are examined after testing to determine that the entire system is ready for immediate automatic or manual operation as the case may be, after completing the tests.

In conclusion, we would like to remind all concerned of an old adage which is, "A chain is only as strong as its weakest link." Applied appropriately, this covers both equipment and operating personnel. Therefore, it is of paramount importance that the master, chief engineer, and all engine room personnel be familiar with the type of fire prevention apparatus on board so that in an emergency, it can be quickly brought into action. Also, after the emergency is over, be able to place the equipment in operating condition and be ready for any future eventualities.

LEARN FIRE PREVENTION BEFORE YOU GO TO BLAZES

MORE PLEASURE BOATS DOCUMENTED AS YACHTS

Vessels of not less than 5 net tons, nor more than 50 gross tons, used exclusively for pleasure, are included in the Bureau of Customs' recent extension of the privilege of documentation as yachts. As in the past, vessels used exclusively for pleasure of more than 15 gross tons may be licensed or enrolled and licensed as yachts, if otherwise entitled to be documented.

Important privileges extended by documentation of vessels as yachts include authority to fly the yacht ensign, a right highly prized by yachtsmen, and the right to voyage to a foreign port without clearing the vessel through United States customs. In the case of yachts of 15 gross tons or less, it includes the right to return to a port of the United States from a foreign port, or ports, without entering the vessel through customs.

Furthermore, provision is made for a recording of mortgages, bills of sale,

and other instrument of title, and the keeping of such records in the offices of the collectors of customs. Owners who document such vessels must effect renewals annually and must report any changes of master to a collector of customs.

The requirements in connection with the documentation of yachts are not mandatory, and it is entirely discretionary with the owner whether he should do so. However, yachts and other vessels which are not documented, which are machinery propelled, which are owned in the United States, and which are found on the navigable waters of this country, must be numbered. There are no restrictions as to the length, tonnage, or size of such vessels under the provisions of the Numbering Act, which should not be confused with those of the Motorboat Act of 1940.

Owners and prospective owners of motorboats and motor vessels of above 15 gross tons are advised that if such vessels carry freight or passengers for hire, they are subject to annual inspection by the Coast Guard, and may not be navigated in such service until a certificate of inspection has been issued.

Motorboats of not more than 65 feet in length which are less than 100 gross tons, when carrying passengers for hire, are only required to be operated by Coast Guard-licensed operators.

Machinery-propelled vessels of above 15 gross tons and in excess of 65 feet in length, carrying freight or passengers for hire, must also be manned with such officers—and a crew—as is determined by the proper Officer in Charge, Marine Inspection, Coast Guard. This complement is stated in the certificate of inspection.

Generally speaking, machinery-propelled vessels of 100 gross tons, or over, are subject to all provisions of the Seaman's Act of March 4, 1915, as amended.

LESSONS FROM CASUALTIES

CURIOSITY KILLED FIVE

How "curious" can people be? In a recent casualty three people were killed; two missing; one seriously burned; and seven others were injured just because one person wanted to find out if an oil slick in a harbor area would burn.

In this case a person's curiosity resulted in his death. While the case sounds fantastic in some respects, it illustrates again that seamen and others connected with ship operation can become involved in a serious fire through no act of their own. On a Sunday afternoon six people were rowing about in a port harbor area watching various port activities. At this time an American tanker was discharging various petroleum products including 100 octane gas, 91 octane gas, regular gasoline, kerosene, and fuel oil. Particular attention had been made to see that none of these products created any oil pollution in the water. However, from other sources there was a considerable oil slick floating on the surface of the water, out from the dock for approximately 400 feet into the harbor area. The six people in the rowboat saw this film of oil on the water and one probably exclaimed "Let's see if it will burn." Whereupon he lit a match and held it over the oil slick. The oil slick immediately burst into flames which ranged from the surface of the water to over 60 feet in the air. In the rowboat, three persons were burned to death, two others were never found, and one was able to swim ashore, but in so doing was severely burned.

The chief engineer on the tanker happened to see the flames start and he sounded a whistle signal from the aft end of the ship. By the time the captain had left his cabin and appeared on the bridge the flames were already licking the side of the tanker. The flames had raced along the surface of the water for approximately 400 feet toward the ship, reaching the port side from abreast the No. 4 lifeboat to abreast of the main pump room and were approximately reaching a height of 60 feet in the air. The master immediately turned in the general alarm, sounded five blasts on the whistle, and proceeded to the scene of the fire to direct and assist in the fire-fighting operations.

At the sound of the first signal all cargo operations were halted. The steam smothering system was turned on to all tanks and main pump rooms, ullage covers and valves were secured, water hoses were brought into play, using all-purpose nozzles for fog effect and straight stream nozzles for cooling deck and bulkheads, and a liquid-foam system was employed with 1½-inch hoses and foam nozzles with pickup tubes. The foam system proved to be most effective. A second foam hose was run out from amidships to prevent the fire from traveling forward, supplemented by hand foam extinguishers. All port holes that could be closed on the port side were closed and a water hose was hooked up and manned to take care of anything which might catch fire in the quarters and to cool the bulkheads and shell of the vessel. Twelve-foot applicators were used to extinguish the fire which had ignited the gear in the No. 4 lifeboat. The fire was brought under control and finally extinguished in approximately 40 minutes. However, the water hoses were kept running for approximately 8 hours to cool the surfaces of the vessel which were extremely hot. The city firemen arrived when the fire was almost out.

The injuries to the ship's personnel during the fire-fighting operation were the result of panic more than anything else. It was necessary to give medical attention to six of the crew members. Four members of the crew suffered serious injuries which required three of them to be hospitalized. The injuries included cuts, bruises, and abrasions, shock, and exhaustion.

The fire was a serious one and caused considerable damage to the tanker, consisting of warped structural members, paint burned off the hull plating from abreast of the funnel on the port side and in way of housing from the water line to bridge and deck, the boat deck was burnt and sheer strake plate slightly burned in two places in way of port side after housing, five port glasses on the port side were shattered, a 5-foot section of hand rail was bent and a fishplate outside the No. 4 lifeboat corrugated for approximately 30 feet, and the No. 4 steel lifeboat had the woodwork and lifesaving gear burnt out and a part of its steel hull dented on the port side.

After the fire the American tanker was towed away from the dock. On the following day permission was granted the vessel to reenter the harbor to finish discharging the balance of its cargo. The investigation indicated that neither the placing of the petroleum products on the water nor its ignition was caused by the American tanker.

In this case the officers are commended on taking immediate steps to prevent a fire on board the ship. The injuries that occurred to the crewmen on board came as a result of not being familiar with techniques of proper fire fighting. While most fire drills on board American ships are intended to put out a fire that may occur on boad the ship, yet it is necessary that they be so familiar with

their duties that they know what is expected of them as soon as competent commands and instructions are given.

This serious fire, resulting in the death of five people, can be attributed solely to "curiosity." It is, therefore, necessary that people working around hazardous articles be careful in what they do and be observant of what other people may do, for it is true that the *small end of a little match may be the end of a big business.*

OCCUPATIONAL HAZARD

Very often we come across cases involving accidents on board vessels resulting in serious injuries and death to crew members and passengers, even after all known safety precautions are put into effect.

A specific case is one which involved a passenger- and motor-vehicle carrying ferry. A crewman's duties on this type of craft may very well be widely varied due to the fact that in addition to the ordinary safety precautions necessary on any ferry he is sometimes obliged to cater to human quirks and frailties of his passengers.

Crewmen who are alert and always ready for the unexpected, as they should be when employed in capacities that require them to serve the public, can very often prevent "freak" accidents. This may be referred to loosely as an "occupational hazard" or perhaps as some crewmen may prefer "occupational nuisance." However, if at times little extra precautions were taken, if a little more effort was expended to insure against the unexpected, many painful and costly injuries could be prevented and even lives saved.

One case involving a ferry carrying, in addition to its other cargo and personnel, an ambulance resulted in three persons losing their lives by drowning and injuries to another.

The ferryboat while moored starboard to a ferry landing on the east bank of a river took aboard three automobiles, including an ambulance containing four persons. The ambuance was the last vehicle to be taken on board before the vessel was to make its trip, and was observed by witnesses to be proceeding very slowly down the incline that led to the ferry, apparently in first gear.

Upon boarding the craft which was heading up river the driver was told by deckhands to go straight across the ferry to the port side gap in the rail so that he would be the first to leave, as was the usual manner of handling ambulances on this type of vessel. Instead the driver cut his wheels to the right and pulled up into the forward part of the ferry a little to the port side and necessary precautions were taken by placing chocks under the front and rear wheels by deckhands.

The driver, upon being asked why he had not parked the vehicle in the position indicated for him, stated that the brakes on the ambulance were faulty, and that if he had proceeded to the front of the ferry he may have continued over the side. This should have immediately put all hands on the alert for any eventualities.

However, the ferry was made ready and proceeded on its trip, and upon arrival it was moored port side to, head upstream, and the chains were removed to permit unloading vehicles. The rear chock was moved back several feet from under the ambulance in order to permit the vehicle to back up into a position to get off the ferry.

The driver started his motor and started to back fairly fast with his front wheels cut to the right and his rear wheel jumped the 4- by 4-inch chock. Another chock was thrown behind the left rear wheel and the vehicle jumped this chock as it picked up speed. When the ambulance jumped the second chock the left front fender struck a crewman knocking him down, and the ambulance continued in reverse, struck the chain between the gap in the starboard side, broke the chain, and went into the river.

The driver's helper, as the vehicle went backwards, managed to open the right door and get out before it went into the river. After falling into the river the ambulance stayed afloat for 3 or 4 minutes during which time the crew threw several life rings, one of which had a light on it. The driver was seen to open the door, however he apparently froze or panicked and failed to reach for the ring which was thrown approximately 5 feet from him. He disappeared with the ambulance as it sank. The master and one crewman lowered a lifeboat, went to the scene and searched for 30 to 45 minutes, but to no avail as none of the occupants appeared after the ambulance sank.

The ambulance was later raised and after an examination was found to have no brakes. Two of the occupants were found still in the vehicle, but the driver was never found.

There was no negligence on the part of the crew for although they were aware of the faulty brakes they adequately chocked the vehicle and if the driver had not become panic stricken he could have backed slowly and perhaps left the ferry successfully. However, perhaps an extra ounce of prevention or precaution in this instance could have saved some lives and injuries.

IT CAN BE DONE

At 10:15 a. m. on December 26, 1950, while the ferry vessel *City of Portsmouth* was underway in the Elizabeth River, a passenger lost his balance and fell overboard. A fellow passenger saw the man fall overboard and notified an oiler who in turn promptly notified the master. The vessel was stopped, a lifeboat quickly launched and the passenger recovered from the water in 10 minutes. The quick and efficient action in launching the lifeboat resulted in saving the passenger's life and reflects alertness and attention to duty on the part of the master, officers, and crew.

The prompt and efficient manner in which the lifeboat was launched and the short time required to rescue the passenger from the water indicates that the master, officers, and crew have complied with the Coast Guard requirements with respect to emergency drills and deserve a salute of WELL DONE.

OVERLOADING TANKERS—UNSAFE AND COSTLY

On January 9, 1951, the tank vessel S. S. *Whittier Hills*, owned by the National Bulk Carriers, Inc., of New York, arrived at the King's Dock in the Port of Swansea, Wales, en route from the Persian Gulf, via Suez and Gibraltar, and was observed to be seriously overloaded by the Chief Marine Surveyor for West Wales attached to the Ministry of Transport. The freeboard of the vessel was measured and found to be 7 feet 10½ inches, whereas it should have been 9 feet 10¼ inches, according to her Load Line Certificate. At the time of overloading the load line of the ship then appropriate was 23¾ inches submerged which was contrary to sections 44 and 57 of Merchant Shipping (Safety and Load Lines Conventions) Act, 1932, of Great Britain.

Action for the overloading was brought against the master of the vessel before the Swansea Justices at the Police Court, Swansea, where he pleaded guilty to the charge and a fine of $7,000 was imposed, together with a charge of $29.40 for attorneys fees.

The overloading of the S. S. *Whittier Hills* with an increase of 23¾ inches of draft imposed an additional extra weight of 1,591 tons on the vessel. In the event of bad weather the whole ship's structure was endangered and could have failed. The United States Coast Guard Load Line Regulations, 46 CFR Part 43, have been violated and the master of the S. S. *Whittier Hills* is liable to charges

under the provisions of R. S. 4450 (46 U. S. C. 239) looking to the suspension or revocation of his license.

The S. S. *Four Lakes* owned by the Mathiasen's Tanker Industries Inc., of Philadelphia, Pa., carrying petroleum products, arriving at Swansea, Wales, on January 31, 1951, en route from the Persian Gulf, and upon entry the Chief Marine Surveyor of the port observed that the vessel's load line was submerged 6¾ inches so that the vessel was overloaded approximately 470 tons. The master of the S. S. *Four Lakes* pleaded guilty to the charge and was fined $2,240 and assessed costs of $29.40. The master of the S. S. *Four Lakes* is subject to action against his license under the provisions of R. S. 4450 (46 U. S. C. 239), as amended.

The overloading of any vessel on international voyages is in violation of the International Load Line Convention of 1930. While the master of a vessel may leave a port of a country not signatory to the Convention, he immediately violates the laws of the United States and brings disgrace upon his own flag by such willful action. The International Load Line Convention was adopted by the signatory nations to further the safety of life at sea and to set safe standards to which a vessel may be loaded.

By overloading a vessel certain hazardous conditions are created:

(1) Bad weather seriously endangers the vessel and the lives of persons aboard.

(2) Ship's structure may be weakened to such an extent that in a later voyage serious damage may occur without apparent justification.

GOOD ADVICE

Thaumatopoe Processiona (Processionary Caterpillar in plain English) feeds on the leaves of a variety of pine tree, and when it has denuded one, the whole colony moves to another, crawling in single file. Each follower's head being snugly fitted against the posterior of his preceder, the entire procession looks like one long unbroken woolly string.

A naturalist once transferred enough of these creatures to the rim of a large jar to comprehend its circumference and put the first in touch with the last. The circle being thus complete, the worms started on a trek which had no end. A supply of their usual food was made available and visible, but as it was off the beaten path they would not touch it, and for 7 days and 7 nights they stupidly maintained their relentless pace until they began to perish from starvation and exhaustion. They were following instinct, habit, blind and unthinking obedience to orders, etc.

Similarly "instructions," "standard practices," "long tradition," "past experience," "established custom," "accepted procedure," "approved methods," or whatever other name you want to call it by, followed without an element of common sense leads to atrophy.

Let's be progressive not processive.

Courtesy of Will Cooper, Gold Boulevard, Glenview, Ill.

APPENDIX

Amendments to Regulations

TITLE 46—SHIPPING

Chapter I—Coast Guard, Department of the Treasury

[CGFR 50-30]

Miscellaneous Amendments to Chapter

A notice regarding proposed changes in the regulations for use in transportation of solidified carbon dioxide (dry ice); marine engineering regulations and material specifications; bulkheads, subdivision, and watertight integrity of passenger vessels; and specifications for lifeboat bilge pumps and watertight sliding doors, was published in the FEDERAL REGISTER, dated August 25, 1950, 15 F. R. 5706 et seq., as Items VIII, XVI, XVII, and XXIV 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 amendments to 46 CFR 46.30, 46.32, 46.38, 46.42, 59.64, 60.57, 76.57, 80.2, 94.56, 98.2, 113.50, and 117.2, regarding bulkheads, subdivision and watertight integrity of passenger vessels or ferry vessels, is to improve the standard of safety and to eliminate inconsistencies between the various regulations and to adequately describe the requirements concerning bulkheads, subdivision, permeability, margin lines, damaged stability, port lights, and openings in watertight bulkheads. In connection with vessels engaged in foreign trade the revised regulations are consistent with the requirements contained in the Safety of Life at Sea Convention of 1948. The purpose of the miscellaneous amendments to 46 CFR Parts 51 to 57, inclusive, is to bring the marine engineering regulations and material specifications up to date with current practices followed by industry and to have the regulations in agreement with the latest revisions of the codes or rules of the American Society of Mechanical Engineers, American Standards Association, and the American Bureau of Shipping. Due to the occurrence of several accidents resulting in loss of life from the use of solidified carbon dioxide on board vessels, the purpose of the new requirements regarding the use and transportation of solidified carbon dioxide (dry ice) in 46 CFR 146.04-5, 146.07-7, 146.08-6, 146.27-100, and 147.05-100 is to promote safety of life at sea. The purpose of the new specification in 46 CFR 160.44, regarding lifeboat bilge pumps, is to provide for a uniform standard and to describe the procedures for obtaining approval. The purpose of the new specification covering the construction of watertight sliding doors in 46 CFR 163.001 is to establish standards of construction and design found to be necessary in the manufacture of such equipment and to describe the procedures for obtaining approval.

By virtue of the authority vested in me as Commandant, United States Coast Guard, by Treasury Department Order No. 120, dated July 31, 1950 (15 F. R. 6521), 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, except the amendments to 46 CFR 46.30, 46.32, 46.38, 46.42, 59.64, 60.57, 76.57, 80.2, 94.56, 98.2, 113.50 and 117.2, which shall become effective on and after April 15, 1951.

Subchapter E—Load Lines

PART 46—SUBDIVISION LOAD LINES FOR PASSENGER VESSELS

RULES FOR DETERMINING SUBDIVISION LOAD LINES FOR PASSENGER VESSELS ENGAGED ON FOREIGN AND COASTWISE VOYAGES

1. Section 46.30 is amended to read as follows:

§ 46.30 *Inlets and discharges.* All main and auxiliary inlets and discharges shall be so arranged as to prevent accidental admission of water into the vessel. Valves fitted on the vessel's sides are to be of substantial construction and are to be effectively protected against damage. Where operating gear is provided the lead thereof should be as direct as possible and all parts of the gear are to be protected against damage. The required valves, operating gear, and arrangement shall be in accordance with § 55.10–70 of Subchapter F of this chapter.

(Sec. 2, 49 Stat. 888, as amended; 46 U. S. C. 88a)

2. Section 46.32 is amended to read as follows:

§ 46.32 *Ash chutes.* Ash chutes shall be in accordance with § 55.10–70 of Subchapter F of this chapter.

(Sec. 2, 49 Stat. 888, as amended; 46 U. S. C. 88a)

3. Section 46.38 is amended to read as follows:

§ 46.38 *Pumping arrangements.* Pumping arrangements shall be in accordance with §§ 55.10–25 and 55.10–30 of Subchapter F of this chapter. Where practicable, power bilge pumps shall be placed in separate watertight compartments situated so that both compartments will not be expected to be flooded by the same damage. Lead pipes shall not be used under coal bunkers or fuel oil storage tanks, nor in boiler or machinery spaces, including motor rooms in which oil settling tanks or oil fuel pump units are situated.

(Sec. 2, 49 Stat. 888, as amended; 46 U. S. C. 88a)

RULES FOR DETERMINING SUBDIVISION LOAD LINE FOR PASSENGER VESSELS ENGAGED ON FOREIGN AND COASTWISE VOYAGES ON THE GREAT LAKES

4. Section 46.42 is amended to read as follows:

§ 46.42 *Exceptions applicable to subdivision Great Lakes vessels.* (a) Sections 46.1 to 46.6, 46.21, 46.22 and 46.28 are not applicable to Great Lakes vessels.

(b) The subdivision, damaged stability, permissible types of watertight doors, and port lights below the bulkhead deck for Great Lakes vessels shall be in accordance with §§ 76.57 and 80.2 of Subchapter H of this chapter.

(c) Sections 46.7 to 46.20, 46.23 to 46.27, and 46.29 to 46.41 are applicable to Great Lakes vessels except that, in § 46.41, all references to Part 43 shall read Part 45 when applied to Great Lakes vessels and a diamond will be substituted for the disk. No "fresh water" lines will be marked.

(Sec. 2, 49 Stat. 888, as amended; 46 U. S. C. 88a)

Subchapter F—Marine Engineering

PART 51—MATERIALS

SUBPART 51.52—CARBON-STEEL BOLTING MATERIAL

Section 51.52–60 is amended by changing paragraphs (b), (c), and (d) to read as follows:

§ 51.52–60 *Workmanship and finish.* * * *

(b) Nuts shall be semifinished, hexagonal in shape, and in accordance with the dimensions for the Heavy Series of the American Standard for Wrench-Head Bolts and Nuts and Wrench Openings (ASA No.: B 18.2–1941).

(c) Bolts shall have regular unfinished square or hexagonal heads and the dimensions of the heads shall conform to the American Standard for Wrench-Head Bolts and Nuts and Wrench Openings (ASA No.: B 18.2–1941).

(d) All bolts and nuts, unless otherwise specified, shall be threaded in accordance with the American Standard Screw Threads, Coarse-Thread Series (ASA No.: B 1.1.–1935).

PART 52—CONSTRUCTION

SUBPART 52.45—COMBUSTION CHAMBERS AND TUBE SHEETS OF FIRE-TUBE BOILERS

1. Section 52.45–15 (c) is amended to read as follows:

§ 52.45–15 *Detail requirements.* * * *

(c) The minimum inner radius of plates flanged to form the combustion chamber and back connections shall be not less than one and one-half times the thickness of the plate flanged.

SUBPART 52.55—BOILER AND SUPERHEATER TUBES

2. Section 52.55–15 (b) is amended to read as follows:

§ 52.55–15 *Detail requirements.* * * *

(b) Tubes may be lengthened or safe-ended by forge, electric-resistance, arc or gas butt welding methods. Arc or gas butt welded joints exceeding 2½ inches shall be nondestructively tested as required by § 56.05–5 of this subchapter. Carbon steel tubing material shall be stress-relieved if arc welded, when the diameter exceeds 2½ inches. Alloy steel tubing shall be given a suitable preheat and postheat treatment to produce acceptable welds if deemed necessary by the Commandant.

(R. S. 4405, 4417a, 4418, 4426, 4429–4434, 49 Stat. 1544, 54 Stat. 346, 1026, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 407–412, 463a, 1333, and 50 U. S. C. 1275)

SUBPART 52.65—SAFETY VALVES

3. Section 52.65–15 (e) (1) is amended to read as follows:

§ 52.65–15 *Installation.* * * *

(e) (1) To insure safety valves being free, each safety valve shall have a substantial lifting device by which the valve disk may be positively lifted from its seat when there is at least 75 percent of the maximum allowable pressure on the boiler. Such mechanism shall be connected by suitable relieving gear so arranged that controls may be operated from the fireroom or engine-room floor.

(R. S. 4405, 4417a, 4418, 4426, 4429–4434, 49 Stat. 1544, 54 Stat. 346, 1026, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 407–412, 463a, 1333, and 50 U. S. C. 1275)

PART 54—UNFIRED PRESSURE VESSELS

Section 54.01–40 (a) is amended to read as follows:

§ 54.01–40 *Tests*—(a) *New pressure vessels.* Upon completion of a new pressure vessel one of the following applicable hydrostatic tests shall be made in the presence of an inspector:

(1) Riveted construction: 1½ times the maximum allowable pressure.

(2) Brazed construction: 1½ times the maximum allowable pressure. (See § 56.05–10 of this subchapter.)

(3) Welded construction: 1½ times the maximum allowable pressure. (See § 56.05–10 of this subchapter.)

(4) Cast construction: 2 times the maximum allowable pressure.

PART 55—PIPING SYSTEMS

SUBPART 55.07—DETAILED REQUIREMENTS

1. Section 55.07–5 is amended by changing table 55.07–5 (a) to read as follows:

§ 55.07–5 *Design pressures and thickness of pipes.* (a) (1) * * *

(R. S. 4405, 4417a, 4418, 4426, 4429–4434, 49 Stat. 1544, 54 Stat. 346, 1026, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 407–412, 463a, 1333, and 50 U. S. C. 1275)

TABLE 55.07-5 (a)—MAXIMUM FIBER STRESSES FOR PIPING

[Pounds per square inch]

FERROUS MATERIALS

Specification subpart	Grade	Minimum tensile strength, pounds per square inch	For temperatures not exceeding ° F.: 650	700	750	800	850	900	950	1,000	1,050
			Multiplier "M" [1]: 0.8	0.8	0.8	0.8	1.1	1.7	2.0	2.0	2.0
Seamless carbon steel:											
51.34	A	48,000	9,600	9,250	8,700	8,000					
51.34	B	60,000	12,000	11,400	10,400	9,100					
51.37	A	48,000	9,600	9,100	8,250						
51.37	B	60,000	12,000	11,400	9,950						
Seamless alloy steel:											
51.34	P1	55,000	11,000	11,000	11,000	10,750	10,500	10,000			
51.34	P2&3	55,000	11,000	11,000	11,000	10,750	10,500	10,000	8,000		
51.34	P3a	60,000	12,000	12,000	12,000	11,800	11,200	10,000	8,000	5,850	3,850
51.34	P3b	60,000	12,000	12,000	12,000	11,800	11,200	10,000	8,000	5,850	3,850
51.34	P5a	60,000	12,000	12,000	12,000	11,800	11,200	10,000	8,000	5,850	
51.34	P5b	60,000	12,000	12,000	12,000	11,800	11,000	8,800	6,600	4,200	
51.34	P5c	60,000	11,000	11,000	11,000	11,000	10,850	10,000	8,000	5,850	
51.34	P11	60,000	12,000	12,000	12,000	11,800	11,200	10,000	8,000	5,850	3,850
51.34	P15	60,000	12,000	12,000	12,000	11,500	11,000	10,000			
Electric-resistance-welded carbon steel:											
51.37 Or 51.40	A	48,000	8,100								
	B	60,000	10,200								
Furnace-welded:											
51.37	Steel	45,000	[2] 4,800								
51.43	Wrought iron	40,000	[2] 4,400								

NONFERROUS MATERIALS

Specification subpart	Grade	Minimum tensile strength, pounds per square inch	For temperatures not exceeding ° F.: 250	300	350	[3] 400
			Multiplier "M" [1]: 0.8	0.8	0.8	0.8
Seamless pipe:						
51.70	Red brass	40,000	8,000	7,000	6,000	3,000
51.73	Copper	30,000	5,000	4,750	4,500	3,000
Brazed pipe	Copper		3,000	[4] 2,000		

[1] Intermediate values of S and M may be obtained by interpolation.
[2] Stress permitted for temperatures not to exceed 450° F.
[3] The same stress may be employed for 406° F.
[4] The same stress may be employed for 320° F.

2. Section 55.07–5 *Design pressures and thickness of pipes* is amended by canceling paragraph (g).

3. Part 55 is amended by adding a new § 55.07–6 reading as follows:

§ 55.07–6 *Expansion and flexibility.* (a) Piping systems shall be designed to have sufficient flexibility to prevent thermal expansion or contraction from causing excessive stresses in the piping material, excessive bending moments at the joints, or excessive forces or moments at points of connection to equipment or at anchorage and guide points.

(b) Provision shall be made for expansion and contraction by changes in direction of pipe runs or by the use of expansion bends, loops, offsets, or slip joints.

(c) Piping shall be installed to avoid excessive strains and shall be adequately supported by hangers or guides, so that the weight of the piping is not transmitted to valves and fittings, and the effects of vibrations, pitching and rolling of the vessel are minimized. Pipe supports shall be designed and arranged so as not to interfere with expansion and contraction of the piping. Anchors, pivots and restraints shall be fabricated and installed to secure the desired points of piping in relatively fixed positions and freely permit expansion and contraction in opposite directions. Main junction points of piping subject to temperatures exceeding 450° F., which are not balance points shall be fitted with fixed anchors. If considered as a balance point the junction point may be free to move in all directions, or may be guided to limit the movement in one or more directions if computations indicate excessive strain may occur in any of the branch pipes.

(d) The combined stresses due to bending and pressure for the normal operating conditions shall not exceed two-thirds of the sum of the "S" value given in table 52.55–10 (a1) in Part 52 of this subchapter and table 55.07–5 (a) for the tubing and piping material at 650° F. and the "S" value at the design temperature.

(e) In order to modify the effect of expansion and contraction, runs of pipe should be cut short and sprung into place. Piping may be cold sprung any amount up to 100% of the total expansion. When it is desired to take credit for cold spring, the piping shall be cold sprung at least half of its computed expansion. In computing stress calculations for the hot condition, the total expansion movement may be reduced by one-third of the actual cold spring applied: *Provided*, That, in the opinion of the Commandant, satisfactory provision is made to obtain the design amount of cold spring. The full amount of cold spring shall be taken into account in considering the forces, moments, and stresses acting in the cold condition.

(f) A summary of the results of pipe stress calculations for the main and auxiliary steam piping where the design temperature exceeds 800° F., together with the arrangement piping drawings, shall be submitted for approval. Calculations shall be made in accordance with one of the recognized methods of stress analysis acceptable to the Commandant. Under no conditions shall the calculated value of the combined stress be taken as less than the total longitudinal stress (the sum of the longitudinal bending stress and the longitudinal pressure stress).

(g) The stress calculations and piping arrangement plans shall indicate all piping runs, connections, materials, sizes, design pressure and temperature, anchorages, guides or junction points, total thermal expansion between anchor points, and design cold spring. The moment of inertia of the pipe shall be based upon the minimum thickness of the pipe or tubing.

(h) Stress calculations shall be made to determine the magnitude and direction of the forces (reactions) and moments at all terminal connections, anchor, guide and junction points, as well as the longitudinal bending and pressure stress, hoop stress, shear stress, and combined stress at all such points. The location of the maximum combined stress shall be indicated in each run of pipe between anchor or junction points. Where deemed necessary by the Commandant, and conditions are

such as to warrant it, calculations for the cold conditions shall be made.

(i) Where it is desired to employ alloy steel pipe materials of better heat resistant properties than those specified in Part 51 of this subchapter, special consideration may be given by the Commandant for an increase in the maximum combined stress, if satisfactory evidence is furnished to establish the suitability of the material for the design temperature.

(R. S. 4405, 4417a, 4418, 4426, 4429–4434, 49 Stat. 1544, 54 Stat. 346, 1026, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 407–412, 463a, 1333, and 50 U. S. C. 1275)

4. Section 55.07–10 (b) is amended to read as follows:

§ 55.07–10 *Valves and fittings.*

* * *

(b) Valves of class I piping having diameters exceeding 2 inches shall have bolted, pressure seal, or breech lock bonnets and flanged or welding ends, except that socket type welding ends shall not be used where the diameter exceeds 2 inches. For diameters not exceeding 2 inches, screwed union bonnet valves or a type which will positively prevent the stem from screwing out of the body may be employed. Cast iron valves with screwed-in or screwed-over bonnets are prohibited. Union bonnet type cast iron valves shall have the bonnet ring made of steel, bronze or malleable iron.

(R. S. 4405, 4417a, 4418, 4426, 4429–4434, 49 Stat. 1544, 54 Stat. 346, 1026, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 407–412, 463a, 1333, and 50 U. S. C. 1275)

5. Section 55.07–15 is amended by changing tables 55.07–15 (e12) and 55.07–15 (e13) to read as follows:

§ 55.07–15 *Joints and flange connections.* * * *

(e) (1) * * *

(Tables are printed in cols. 2 and 3.)

(R. S. 4405, 4417a, 4418, 4426, 4429–4434, 49 Stat. 1544, 54 Stat. 346, 1026, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 407–412, 463a, 1333, and 50 U. S. C. 1275)

6. Section 55.07–20 is amended by canceling subparagraph (a) (3) and by changing paragraph (b) and table 55.07–20 (b) to read as follows:

§ 55.07–20 *Bolting.* * * *

(b) *Materials.* (1) For temperatures not exceeding 450° F., commercial carbon-steel bolting material may be used for attaching heads, doors, covers, or flanges. Carbon-steel bolting and nut material shall comply with Subpart 51.52 of this subchapter.

TABLE 55.07–15 (e12)—SERVICE PRESSURE RATINGS FOR CARBON STEEL PIPE FLANGES AND FLANGED FITTINGS[1]

	Carbon steel flanges and flanged fittings at temperatures 800° F. and below with standard facings (other than ring joints)							Carbon steel flanges and flanged fittings at temperatures 800° F. and below with ring-joint facings						
Primary service pressure ratings	150	300	400	600	900	1,500	2,500	150	300	400	600	900	1,500	2,500
Maximum hydrostatic shell test pressures[2]	350	900	1,200	1,800	2,700	4,500	7,500	425	1,100	1,450	2,175	3,250	5,400	9,000
Service temperatures (°F.)	Maximum, nonshock, service pressure ratings at temperatures from 100° to 800° F.							Maximum, nonshock, service pressure ratings at temperatures from 100° to 800° F.						
100	230	600	800	1,200	1,800	3,000	5,000	275	720	960	1,440	2,160	3,600	6,000
150	220	590	785	1,180	1,770	2,950	4,915	255	710	945	1,420	2,130	3,550	5,915
200	210	580	770	1,160	1,740	2,900	4,830	240	700	930	1,400	2,100	3,500	5,830
250	200	570	760	1,140	1,710	2,850	4,750	225	690	920	1,380	2,070	3,450	5,750
300	190	560	740	1,120	1,680	2,800	4,660	210	680	910	1,365	2,050	3,415	5,690
350	180	550	725	1,095	1,645	2,740	4,565	195	675	900	1,350	2,025	3,375	5,625
400	170	540	710	1,075	1,615	2,690	4,475	180	665	890	1,330	2,000	3,330	5,550
450	160	525	700	1,050	1,580	2,630	4,380	165	660	875	1,320	1,975	3,295	5,490
500	[3] 150	500	665	1,000	1,500	2,500	4,165	[3] 150	625	835	1,250	1,875	3,125	5,210
550	140	475	630	950	1,420	2,370	3,950	140	590	790	1,180	1,775	2,955	4,925
600	130	445	590	890	1,330	2,220	3,700	130	555	740	1,110	1,660	2,770	4,620
650	120	415	550	830	1,240	2,070	3,450	120	515	690	1,030	1,550	2,580	4,300
700	110	380	500	760	1,140	1,900	3,160	110	470	635	940	1,410	2,350	3,920
750	100	340	450	680	1,020	1,700	2,830	100	425	575	850	1,275	2,125	3,550
800	92	[3] 300	[3] 400	[3] 600	[3] 900	[3] 1,500	[3] 2,500	92	365	490	730	1,100	1,830	3,050

[1] All pressures are in pounds per square inch, gauge.
[2] All tests shall be made with water at a temperature not to exceed 125° F.
[3] Primary service pressure rating.

TABLE 55.07–15 (e13)—SERVICE PRESSURE RATINGS FOR ALLOY STEEL PIPE FLANGES AND FLANGED FITTINGS[1]

	Alloy steels of suitable heat resistant properties at temperatures 1,000° F. and below with standard facings (other than ring joints)[2]						Alloy steels of suitable heat resistant properties at temperatures 1,000° F. and below with ring joint facings[2]					
Primary service pressure ratings	300	400	600	900	1,500	2,500	300	400	600	900	1,500	2,500
Maximum hydrostatic shell test pressure[3]	900	1,200	1,800	2,700	4,500	7,500	1,100	1,450	2,175	3,250	5,400	9,000
Service temperatures (° F.)	Maximum, nonshock, service pressure ratings at temperatures from 100° to 1,000° F.						Maximum, nonshock, service pressure ratings at temperatures from 100° to to 1,000° F.					
100	600	800	1,200	1,800	3,000	5,000	720	960	1,440	2,160	3,600	6,000
150	590	785	1,180	1,770	2,950	4,915	710	945	1,420	2,130	3,550	5,915
200	580	770	1,160	1,740	2,900	4,830	700	930	1,400	2,100	3,500	5,830
250	570	760	1,140	1,710	2,850	4,750	690	920	1,380	2,070	3,450	5,750
300	560	740	1,120	1,680	2,800	4,660	680	910	1,365	2,050	3,415	5,690
350	550	725	1,095	1,645	2,740	4,565	675	900	1,350	2,025	3,375	5,625
400	540	710	1,075	1,615	2,690	4,475	665	890	1,330	2,000	3,330	5,550
450	525	700	1,050	1,580	2,630	4,380	660	875	1,320	1,975	3,295	5,490
500	500	665	1,000	1,500	2,500	4,165	625	835	1,250	1,875	3,125	5,210
550	475	630	950	1,420	2,370	3,950	590	790	1,180	1,775	2,955	4,925
600	445	590	890	1,330	2,220	3,700	555	740	1,110	1,660	2,770	4,620
650	415	550	830	1,240	2,070	3,450	515	690	1,030	1,550	2,580	4,300
700	380	500	760	1,140	1,900	3,160	470	635	940	1,410	2,350	3,920
750	360	475	720	1,080	1,800	2,995	425	575	850	1,275	2,125	3,550
800	340	450	680	1,020	1,700	2,830	375	500	750	1,125	1,875	3,125
850	320	425	640	960	1,600	2,665	350	475	700	1,050	1,750	2,925
900	[4] 300	[4] 400	[4] 600	[4] 900	[4] 1,500	[4] 2,500	325	425	650	975	1,625	2,700
950	265	350	530	795	1,325	2,205	[4] 300	[4] 400	[4] 600	[4] 900	[4] 1,500	[4] 2,500
1,000	190	250	380	570	950	1,580	230	310	470	700	1,170	1,950

[1] All pressures are in pounds per square inch, gauge.
[2] Carbon-molybdenum steel flanges and flanged fittings are not permitted for temperatures exceeding 900° F.
[3] All tests shall be made with water at a temperature not to exceed 125° F.
[4] Primary service pressure ratings.

Bolting and nuts shall meet the minimum requirements of American Standard Coarse-Thread Series. Nuts shall meet the requirements of American Standard Heavy Dimensions as given in table 55.07–20 (b).

(2) For temperatures exceeding 450° F., high strength or alloy steel bolting material complying with the requirements of Subpart 51.49 of this subchapter shall be employed. Nut material shall comply with Subpart 51.55 of this subchapter. Bolting and nuts shall meet the minimum requirements of the American Standard Heavy Dimensions and the American Standard Threads for High Strength Bolting as given in table 55.07–20 (b). Washers are not required but when used shall be of forged rolled steel.

TABLE 55.07-20 (b)—BOLTING AND NUTS

[All dimensions given are in inches]

Diameter	Commercial steel bolts		High strength steel bolts		American Standard heavy nuts semifinished hexagonal		
	Number of threads [1]	Root area	Number of threads [1]	Root area	Width across flats (minimum)	Width across corners (minimum)	Nut thickness (minimum)
½	13	0.126	13	0.126	0.850	0.969	0.464
⅝	12	.162	12	.162	.909	1.037	.526
¾	11	.202	11	.202	1.031	1.175	.587
⅞	10	.302	10	.302	1.212	1.382	.710
⅞	9	.419	9	.419	1.394	1.589	.833
1	8	.551	8	.551	1.575	1.796	.956
1⅛	7	.693	8	.728	1.756	2.002	1.097
1¼	7	.890	8	.929	1.938	2.209	1.187
1⅜	6	1.054	8	1.155	2.119	2.416	1.310
1½	6	1.294	8	1.405	2.300	2.622	1.433
1⅝	5½	1.515	8	1.680	2.481	2.828	1.556
1¾	5	1.744	8	1.980	2.662	3.035	1.679
1⅞	5	2.049	8	2.304	2.844	3.242	1.802
2	4½	2.300	8	2.652	3.025	3.449	1.925
2¼	4½	3.021	8	3.423	3.388	3.862	2.155
2½	4	3.716	8	4.292	3.750	4.275	2.401
2¾	4	4.619	8	5.259	4.112	4.688	2.647
3	4	5.621	8	6.324	4.475	5.102	2.893

[1] All bolting shall have threads at least as strong as American Standard screw threads.

7. Section 55.07–25 is amended by canceling paragraph (b) and by changing paragraph (a) to read as follows:

§ 55.07–25 *Installation.* (a) Slip joints shall not be used in cargo holds, deep tanks, and in other places that are not always accessible, except that they may be used in cargo lines of tank vessels. Where used, slip joints shall be provided with positive means for preventing the end of the pipe from pulling out of the joint.

(R. S. 4405, 4417a, 4418, 4426, 4429–4434, 49 Stat. 1554, 54 Stat. 346, 1026, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 407–412, 463a, 1333, and 50 U. S. C. 1275)

8. Section 55.07–30 is amended to read as follows:

§ 55.07–30 *Tests*—(a) *Before installation.* (1) The manufacturer shall test all valves and fittings to a hydrostatic shell pressure as follows:

(i) For steam ratings; bronze, malleable iron, and cast iron: 2 times the primary pressure rating marked on the valve or fitting.

(ii) For steam ratings; steel: The respective test pressures as prescribed in tables 55.07–15 (e12) and 55.07–15 (e13).

(iii) For liquid or gas service not exceeding 150° F.; bronze or malleable iron; 1½ times the secondary pressure rating marked on the valve or fitting.

(2) Special valves, such as manifolds, scuppers, seacocks and appurtenances shall be tested to twice the design pressure stamped thereon.

(3) Pipe shall be subjected to the hydrostatic test pressure required by the respective specifications as prescribed in Part 51 of this subchapter.

(b) *After installation.* (1) The following piping systems shall be hydrostatically tested in the presence of an inspector at a pressure of 1½ times the maximum allowable pressure:

(i) Class I steam, feed-water, blow-off, and compressed air piping, except that where piping is attached to boilers by welding without practical means of blanking off for testing, the piping shall be subjected to the same hydrostatic pressure to which the boilers are tested.

(ii) Fuel oil discharge piping between the pumps and the burners, but not less than 500 p. s. i.

(iii) High-pressure piping for tank-cleaning operations.

(iv) Inflammable or corrosive liquids and compressed gas cargo piping, but not less than 150 p. s. i.

(v) Hydraulic oil piping.

(vi) Any class I piping not specifically listed in this paragraph.

(vii) Cargo oil piping.

(viii) Firemains, but not less than 150 p. s. i.

(ix) Fuel oil transfer and filling piping.

(2) Refrigeration piping shall be leak-tested to the design pressures as indicated in table 55.13–5.

(3) Piping systems not specifically listed in this paragraph shall be tested under working conditions.

(4) Arc or gas welded pipe joints of class I piping which are not examined by radiography shall be given a hammer test as required by § 56.05–10 of this subchapter.

(5) The required test pressures shall be maintained a sufficient length of time to permit an inspection to be made of all joints and connections.

(6) The setting of the safety or relief valve is considered as establishing the maximum allowable pressure of the system.

(R. S. 4405, 4417a, 4418, 4426, 4429–4434, 49 Stat. 1544, 54 Stat. 346, 1026, and sec. 5 (e), 55 Stat 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 407–412, 463a, 1333, and 50 U. S. C. 1275)

SUBPART 55.10—PUMPING ARRANGEMENTS AND PIPING SYSTEMS

9. Section 55.10–55 (f) is amended to read as follows:

§ 55.10–55 *Lubricating oil system.* * * *

(f) Steam turbine driven propulsion and auxiliary generating machinery depending on forced lubrication shall be arranged to shut down automatically upon failure of the lubricating system.

(R. S. 4405, 4417a, 4418, 4426, 4429–4434, 49 Stat. 1544, 54 Stat. 346, 1026, and sec. 5 (e), 55 Stat 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 407–412, 463a, 1333, and 50 U. S. C. 1275)

PART 56—ARC WELDING, GAS WELDING, AND BRAZING

SUBPART 56.05—TESTS AND INSPECTIONS

Section 56.05–10 is amended to read as follows:

§ 56.05–10 *Hydrostatic and hammer tests.* (a) Arc or gas welded vessels which have been both stress-relieved and radiographed need not be subjected to the hammer test but shall be hydrostatically tested to not less than 1½ times the maximum allowable pressure for a sufficient time to permit an inspection of all joints and connections. Welded pressure vessels, 12 feet or less in diameter and/or 20 feet or less in vertical height, the welded joints of which are not stress-relieved and radiographed, shall be subjected to a hydrostatic test pressure of at least 1¼ times but not more than 1½ times the maximum allowable pressure, and while subject to this pressure all welded joints shall be given a thorough hammer or impact test. This impact test shall consist of striking the plate at 6-inch intervals on both sides of the welded joint and for the full length of all welded joints. The weight of the hammer in pounds shall approximately equal the thickness of the shell in tenths of an inch, but not to exceed 10 pounds, and the plates shall be struck with a sharp swinging blow. The edges of the hammer shall be rounded so as to prevent defacing the plate. This hammer test shall be applied to vessels over 12 feet in diameter and/or 20 feet or more in vertical

height while they are empty prior to the hydrostatic test.

(b) Following the hammer test, the vessels shall be hydrostatically tested to not less than 1½ times the maximum allowable pressure for a sufficient length of time to permit an inspection of all joints and connections.

(c) On all other pressure parts the hydrostatic pressure shall be maintained at not less than 1½ times the maximum allowable pressure for a sufficient length of time to permit complete inspection.

(d) The maximum allowable pressure used in determining the hydrostatic tests shall be that for which an unfired pressure vessel is suitable at normal atmospheric temperature based on the actual dimensions and material thicknesses of the vessel.

(e) Pinholes, cracks, or other defects shall be repaired only by chipping, machining, or burning out the defect and rewelding. For gas welding, the metal around the defects shall be preheated to a dull red for a distance of at least 4 inches all around. Any preheating means may be used, such as a flange fire, gas or oil burner, or a welding torch. The preheating shall be done slowly, so the heat will soak into the plate and expand it thoroughly. After welding, the vessel shall be reheated in the vicinity of each weld until the heat has equalized in the dull-red spot, and then slowly cooled. For arc welding, preheating or reheating is not required.

(f) Vessels requiring stress relieving shall be stress-relieved after any welding repairs have been made.

(g) After repairs have been made the vessel shall again be tested in the regular way, and if it passes the test, the inspector shall accept it. If it does not pass the test, the inspector can order supplementary repairs, or, if in his judgment the vessel is not suitable for service, he may permanently reject it.

(R. S. 4405, 4417a, 4418, 4426, 4429–4434, 49 Stat. 1544, 54 Stat. 346, 1026, and sec. 5 (e), 55 Stat 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 407–412, 463a, 1333, and 50 U. S. C. 1275)

PART 57—INSTALLATIONS, TESTS, INSPECTION, REPAIRS, AND MISCELLANEOUS REQUIREMENTS

SUBPART 57.10—TESTS AND INSPECTIONS

1. Section 57.10–15 is amended to read as follows:

§ 57.10–15 *Tests and inspection of boilers and main steam pipes in service.* (a) The boilers of all vessels subject to inspection, and other equipment as stipulated in this subpart, shall be subjected to periodic tests and inspections. Annually, at the inspection period, all boilers, superheaters, and economizers shall be examined internally and externally; and safety valves shall be set under steam at the maximum allowable pressure as prescribed in § 57.10–20. Hydrostatic tests shall be applied to all boilers as provided in table 57.10–15 (a) at the regular inspection period.

TABLE 57.10–15 (a)—HYDROSTATIC TESTS

Boiler (type)	Passenger vessels	Cargo, tank, and miscellaneous vessels
Fire tube	Annual	Annual.
Water tube	do	Quadrennial.

(b) Fire tube boilers which can be satisfactorily examined internally, except as indicated in paragraph (c) of this section, and all water tube boilers, shall be subjected to a hydrostatic test equal to 1¼ times the maximum allowable pressure at the regular inspection period, as provided in paragraph (a) of this section.

(c) Fire tube boilers which cannot be entered or which cannot be satisfactorily examined internally, and all boilers of lap-seam construction, shall be subjected to a hydrostatic test equal to 1½ times the maximum allowable pressure at the regular inspection period, as provided in paragraph (a) of this section.

(d) Main steam piping shall be subjected to a hydrostatic test equal to 1¼ times the maximum allowable pressure at the same periods prescribed for boilers in paragraph (a) of this section. The hydrostatic test shall be applied from the boiler drum to the throttle valve. If the covering of the piping is not removed, the test pressure shall be maintained on the piping for a period of ten minutes, and, if any evidence of moisture or leakage is detected, the covering shall be removed and the piping thoroughly examined.

(e) Boilers to which extensive repairs have been made, or the strength of which the inspector has any reason to doubt, shall be subjected to a hydrostatic test equal to 1½ times the maximum allowable pressure. The inspector, whenever he deems it necessary, or whenever evidence of moisture or leakage appears, shall have part or all of the boiler covering, refractory and internal fittings removed so that a complete internal and external examination of the boiler may be made. If the inspector has reason to believe that the boiler has deteriorated to any appreciable extent at the bottom where it rests on saddles or foundations, he shall have the boiler lifted so that it can be thoroughly examined if the examination cannot be made otherwise.

(f) At the annual inspection the inspector shall subject such parts as stays, flues, furnaces, and such other parts of the boiler as found necessary to a hammer or drill test or both.

(g) The inspector shall carefully examine the ligaments between rivets and between tube holes to ascertain if any cracks have started. The inspector shall also examine the edges of manholes or other openings and the edges of riveted joints to ascertain if cracks have started in the plate.

(h) The inspector shall examine the casing, brickwork, refractory and baffles. If any part is found in bad condition, he shall require such repairs or renewals as may be necessary.

(i) In applying hydrostatic pressure to boilers, arrangements shall be made to prevent main and auxiliary stop valves from being subjected at the same time to hydrostatic pressure on one side and steam pressure on the opposite side. Vessels laid up when undergoing annual inspection may have the hydrostatic pressure applied to boilers at any time preceding the date of the final inspection. However, in no instance will a passenger vessel be allowed to navigate for a period to exceed 12 months from the date of issue of the certificate of inspection, nor will a cargo, tank, or miscellaneous vessel be allowed to navigate for a period to exceed 1 or 4 years as provided in paragraph (a) of this section from the date of issue of the certificate of inspection, without the application of the hydrostatic pressure, except as provided in R. S. 4421, as amended (46 U. S. C. 399).

(j) The inspector may require any boiler to be drilled to determine the actual thickness at any time if doubt exists as to its safety. However, after a Scotch, western river, or other fire tube or flue boiler has been installed for 10 years, the inspector, at the first annual inspection thereafter, and at such subsequent periods as may be deemed necessary, shall cause the boiler to be drilled at or near the water line and bottom, and at such other places as he may deem necessary, for the purpose of gauging the shell to determine the extent of deterioration. If the thickness found by actual measurement is less than the original thickness, the maximum allowable pressure shall be recalculated using the thinnest portion of the shell plate as the thickness of the shell, and shall not exceed the maximum pressure permitted by the applicable boiler design formulas. For the purpose of such recalculation the formulas found in Parts 50 to 57, inclusive, of this subchapter shall be used for boilers made

or contracted for on or after July 1, 1935. The design formulas specified in Part 58 of this subchapter may be used for boilers made or contracted for prior to July 1, 1935, or alternatively the design formulas set forth in Parts 50 to 57, inclusive, of this subchapter may be used for such boilers.

(R. S. 4405, 4417a, 4418, 4426, 4429–4434, 49 Stat. 1544, 54 Stat. 346, 1026, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 407–412, 463a, 1333, and 50 U. S. C. 1275)

2. Section 57.10–20 (a) is amended to read as follows:

§ 57.10–20 *Inspection of mountings and attachments*—(a) *Boiler stop valves and mountings.* The Officer in Charge, Marine Inspection, shall require all valves on boilers to be opened up every 4 years at the time of annual inspection or at the next regular overhaul period thereafter. All flanged valves shall be removed from the boiler at least once in every 8 years to determine the condition of the studs or bolts connecting the valves to the boiler and to permit examination of those parts of the valves which are not susceptible to examination by simply opening up the valves. When, as in the case of some of the older boilers, the valves are connected to nozzles or stools which are secured to the boiler by studs or bolts, the nozzle itself should also be removed from the boiler at 8-year intervals to permit examination of the studs or bolts connecting it to the boiler. When valves are bolted to nozzles or stools which are riveted or welded to the boiler, these riveted or welded joints should not be broken unless there is evidence of leakage or the Officer in Charge, Marine Inspection, is of the opinion that examination of such joints is necessary. These examinations may be made at intermediate periods if there is any evidence to indicate that defects have started or excessive corrosion exists. Where one or more flanged joints intervene between a stop valve and the boiler drum such flanged joints need not be opened up at the time the valve is removed from its flanged joint but may be opened up at any time the Officer in Charge, Marine Inspection, is of the opinion that examination of such joints is necessary. A record of the inspection of the valves will be made on Form CG 840–B and a notation made on the certificate of inspection. This notation will be carried on each certificate until the next period of examination arrives.

(R. S. 4405, 4417a, 4418, 4426, 4429–4434, 49 Stat. 1544, 54 Stat. 346, 1026, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 407–412, 463a, 1333, and 50 U. S. C. 1275)

SUBPART 57.15—REPAIRS

3. Section 57.15–1 is amended to read as follows:

§ 57.15–1 *Welding repairs to existing boilers and unfired pressure vessels.* (a) Repairs to boilers or unfired pressure vessels fabricated of carbon steel may be performed by welding provided the welding meets the applicable requirements of Part 56 of this subchapter. No repairs by welding shall be made, except temporary emergency repairs, without the approval of the Officer in Charge, Marine Inspection. Emergency repairs shall be replaced with permanent repairs meeting the requirements of this subchapter when the vessel returns to a port in which an Officer in Charge, Marine Inspection, is located, except in the case of minor repairs which in the opinion of the Officer in Charge, Marine Inspection, do not materially affect the safety of the boiler or pressure vessel.

(b) Repair welding of power boilers not meeting requirements for class I welding is prohibited unless the stress is carried by such other type(s) of construction complying with the requirements of this subchapter, and where the adequacy of the boiler design is not solely dependent upon the strength of the welds.

(c) Welding repairs are permitted in stay-bolted areas or areas adequately stayed by other means so that should failure of the welds occur the stress will be carried by stays. The welds shall be located entirely within staybolted areas which prohibit welds passing through the outer row of stays.

(d) Cracks extending from the caulking edge of plates to the rivet holes of circumferential joints may be welded provided the cracks are veed out so that complete penetration of the weld metal is secured.

(e) Circumferential cracks from rivet hole to rivet hole in girth joints may be welded provided there are not more than three consecutive cracked ligaments nor more than a total of six cracked ligaments in any one girth joint.

(f) Cracks in staybolted plates may be welded provided they are located entirely within staybolted areas and the total length of any crack or series of consecutive cracks does not exceed two staybolt pitches.

(g) Cracks in plain, circular or Adamson ring or similar type furnaces may be welded provided any one crack does not exceed 12 inches in length and after completion the weld is stress-relieved as required by § 56.01–70 of this subchapter. Cracks in corrugated furnaces may be repaired by welding provided any one crack does not exceed 20 inches in length.

(h) Fire cracks may be welded at riveted door openings, extending from the edge of the plate, but not more than 2 inches beyond the centerline of the rivet holes.

(i) Cracks may be welded between tube holes in the shell of water-tube boiler drums, provided there are not more than two cracks in any one row in any direction, nor more than a total of four cracks in a drum, and further provided the welding meets the requirements of this subchapter for class I welding and is approved by the Commandant.

(j) All cracks permitted to be repaired under this subpart shall be excavated to sound metal by grinding, flame gouging or chipping out the defective metal to form a clean welding groove. Either a vee groove or "U" groove wherein complete penetration of the weld metal is secured may be used. The first two methods of excavation are preferable. After excavation is completed and prior to welding, the excavated area shall be examined by magnetic particle testing to insure that the entire crack was excavated. When the reverse side of the weld is accessible the root of the weld shall be chipped or ground out to insure a clean surface of the originally deposited metal and the resultant groove welded to obtain a sound weld having complete penetration. During welding a preheat of 200 degrees plus or minus 50 degrees F. shall be maintained by controlled temperature. For thicknesses exceeding $\frac{3}{4}$ inch, suitable "U" grooves should be employed. A welding sequence shall be used so as to equalize welding stresses. Each complete bead of welding except the last shall be peened before depositing the succeeding bead.

(k) After cracks originating in tube or rivet holes are repaired by welding the holes shall be properly reamed and the weld reinforcing ground flush with the plate in way of rivet heads.

(l) The welding of cracks or the repairs to drums of power boilers, except as otherwise permitted in this subpart, is prohibited.

(m) The edge preparation and preheat of butt-welded joints employed in the renewal of defective or corroded boiler plates shall comply with the requirements of paragraph (j) of this section.

(n) It is not permitted to reinforce or build up by welding the heads of rivets or staybolts that have deteriorated. Such rivets or staybolts shall be replaced. The seal welding of rivet heads to secure tightness is prohibited.

(o) Corroded surfaces in the caulking edges of circumferential seams may be built up by welding to the

original thickness under the following conditions:

(1) The thickness of the original metal to be built up between rivet holes and caulking edge shall not be less than one-fourth of the diameter of the rivet hole, and the portion of the caulking edge to be thus reinforced shall not exceed 30 inches in length in a circumferential direction.

(2) In all repairs to circumferential seams by welding, the rivets shall be removed over the portions to be welded for a distance of at least 6 inches beyond the repaired portion.

(3) After repairs are made the rivet holes shall be reamed before the rivets are re-driven.

(p) Where leaks occur in riveted joints or connections, they shall be carefully investigated to determine the cause. Such leaks may be made tight by seal welding the edge, if, in the opinion of the Officer in Charge, Marine Inspection, this will make a satisfactory repair.

(q) It is not permissible to build up or reinforce a grooved or corroded area of unstayed internal surfaces by means of welding, except that widely scattered pit holes may be built up by welding.

(r) Where external corrosion has reduced the thickness of flat plates around hand holes to an extent of not more than 40 percent of the original thickness and for a distance not exceeding 2 inches from the edge of the hole, the plate may be built up by welding.

(s) Where stayed sheets have corroded to a depth not exceeding 40 percent of their original thickness, they may be reinforced or built up by welding. Where the staybolts are fitted with riveted heads, the staybolts in the reinforced area shall be renewed in accordance with the provisions of Subparts 52.30 and 52.35 of this subchapter, but where the staybolts are fitted with nuts, the nuts may be removed and after reinforcing has been applied, collars may be welded around the staybolts in lieu of the nuts. Such reinforced areas shall not exceed 400 square inches nor more than 30 inches in one direction. Two such areas in any one plate may be reinforced: *Provided,* That the distance between the reinforced surfaces is not less than 30 inches.

(t) When the corroded portion of a staybolted surface exceeds 400 square inches, it is permissible to repair the same by cutting out the defective portion and replacing it with a new plate, the edges of the new plate to be welded in position. In such cases, new staybolts shall be fitted in accordance with the requirements of Subparts 52.30 and 52.35 of this subchapter and where welding is performed through a line of staybolts, welded collars as required by figure 52.35–1 of this subchapter shall be used to attach the staybolts.

(u) Flat tube sheets in fire-tube boilers which have corroded or where cracks exist in the ligaments may be repaired by welding.

(v) Unreinforced openings in the shells or drums of boilers or pressure vessels, the diameter of which does not exceed the maximum diameter of an unreinforced opening in accordance with figures 52.25–15 (b1) and 52.25–15 (b2) of this subchapter, may be closed by the use of a patch or plate inside the drum or shell and sealed against leakage by welding. Such plates shall have a diameter of at least 2 inches larger than the diameter of the hole and shall have a thickness equal to the thickness of the plate to which it is attached. It is not permissible to insert such patches in the shell or head flush with the surrounding plate unless the requirements of this subchapter for Class I welding are met.

(w) Portions of tube sheets which have deteriorated may be renewed by replacing the wasted portion with a new section. The ligaments between the tube holes may be joined by means of welding and staytubes, or other acceptable means of lowering the stress on the repaired section may be installed if in the judgment of the Officer in Charge, Marine Inspection, it is necessary.

(x) Where leaks develop around staybolts which are otherwise in good condition, the nuts may be replaced with a beveled collar formed around the end of the stay by means of welding. In such cases, the depth of the collar measured on the stay and the width measured on the plate, shall be equal to one-half the diameter of the staybolt. (See figure 52.35–1 (l) of this subchapter.)

(y) Only welded repairs as specified in this subchapter are permitted on boilers and unfired pressure vessels. Such method of repairs by means of welding not covered by regulations in this subchapter shall be referred to the Commandant and may be authorized by him if, in his opinion, it meets the intent of the regulations in this subchapter. Welding repairs to boilers and unfired pressure vessels fabricated of alloy steel will be given special consideration by the Commandant.

(R. S. 4405, 4417a, 4418, 4426, 4429–4434, 49 Stat. 1544, 54 Stat. 346, 1026, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 407–412, 463a, 1333, and 50 U. S. C. 1275)

4. Section 57.15–25 is amended to read as follows:

§ 57.15–25 *Repair of wrapper plates and back heads.* Wrapper plates and back heads may be renewed in whole or repaired as follows:

(a) Wrapper plates or back heads shall be cut between two rows of staybolts or on a line of staybolts where the thickness is approximately the same as the original construction. If welding is employed on a line of staybolts, the staybolts shall be fitted with a welded collar as required in figure 52.35–1 of this subchapter.

(b) The edges of wrapper plates riveted to tube sheets and back heads shall be removed by cutting out the rivets.

(c) The edges of existing plates and new plates shall be beveled by chipping, flame cutting, or grinding so as to form a suitable groove whereby complete penetration of the weld metal will be obtained. The edge preparation and preheat shall comply with the requirements of § 57.15–1 (j).

(d) The edges of the new plate shall be butt-welded and the plate shall be riveted to the flanges of the tube sheet and back heads and the staybolts renewed.

(e) Sections of wrapper plates of combustion chambers outside of stayed areas may be repaired by welding provided the welded joints are stress-relieved by means of controlled heat and the joints are nondestructively tested.

(R. S. 4405, 4417a, 4418, 4426, 4429–4434, 49 Stat. 1544, 54 Stat. 346, 1026, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 392, 404, 407–412, 463a, 1333, and 50 U. S. C. 1275)

Subchapter G—Ocean and Coastwise; General Rules and Regulations

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

Section 59.64 is amended to read as follows:

§ 59.64 *Subdivision and watertight integrity of passenger vessels of less than 150 gross tons.* (a) Every mechanically propelled vessel of less than 150 gross tons, whether or not specifically required by paragraph (b) of this section to meet a one-compartment standard of subdivision, shall be fitted with not less than 3 transverse watertight bulkheads.

(b) Every passenger vessel carrying more than 49 passengers, or of more than 75 gross tons and less than 150 gross tons, shall be subdivided so as to be capable of remaining afloat and with positive stability with any one main compartment flooded.

(c) To be considered effective, watertight bulkheads abaft the collision bulkhead shall be spaced not less than 10 feet plus 3 percent of the load waterline length. The collision

bulkhead shall be fitted not more than 10 feet plus 5 percent of the load waterline length abaft the bow at the load waterline and not less than 5 percent of the load waterline length (5-foot minimum for steam vessels) abaft the bow at the load waterline. Bulkheads in vessels of wood construction (except steam vessels) may be of wood.

(d) Watertight bulkheads shall not be stepped unless additional subdivision is provided in way of the step to maintain the same measure of safety as that secured by a plane bulkhead. If watertight bulkheads are recessed, either the recess shall be inboard from the vessel's side by at least one-fifth the beam amidships measured at right angles to the center line at the level of the load waterline, or additional subdivision shall be provided in way of the recess to maintain the same measure of safety as that secured by a plane bulkhead. Where the vessel can withstand the flooding of the two adjacent compartments separated by a stepped or recessed bulkhead and no part of such bulkhead is nearer to either of the other bulkheads bounding the adjacent compartments than is permitted by paragraph (c) of this section, the step or recess will be acceptable.

(e) Permeability of machinery spaces shall be taken at 85 percent and of all other spaces at 95 percent, except as follows:

(1) Tanks, chain lockers, and spaces normally filled with cargo, stores, mail, or baggage in the full load condition may be taken at a permeability of 60 percent.

(2) For purposes of calculating stability in the damaged condition, tanks or tight voids shall be taken either at 95 percent permeability or at zero permeability whichever results in the more severe requirement.

(f) In making subdivision calculations, the undamaged vessel is to be assumed floating at the maximum service draft and at a trim consistent therewith. Sinkage, trim, and heel after damage shall not be permitted beyond a margin line 3 inches below the top of the bulkhead deck at side. In the case of vessels, where the mean of the maximum sheer forward and aft is less than 12 inches, a modified margin line 3 inches below the top of the bulkhead deck at the ends of the vessel but lowered throughout its length so as to have a mean parabolic sheer of 12 inches is to be used. Where the bulkhead deck is not continuous the margin line shall be such as to give at least a standard of safety equivalent to the foregoing.

(g) Heel due to final unsymmetrical flooding shall be limited to fifteen degrees, except that under circumstances where such heel after damage may be deemed to constitute an undue hazard, the Commandant may require a lesser angle of heel. Equalizing arrangements, where required, shall not be dependent either upon manual or automatic operation of valves. Temporary heel prior to full equalization shall not be excessive.

(h) The bulkhead deck, or superstructure inclosing any portion thereof, shall be effectively weathertight. Adequate freeing arrangements shall be provided.

(i) Portlights shall not be fitted below the margin line.

(j) Openings in watertight bulkheads shall be the minimum consistent with proper operation of the vessel and shall be located as high in the bulkheads and as far inboard as practicable. Watertight doors are not permitted in forepeak bulkheads. Watertight doors between cargo spaces or between cargo and working spaces will not ordinarily be permitted. Watertight doors within accommodation and working spaces shall in no case exceed five in number and shall be of approved hand-operated sliding type. On vessels which do not proceed more than 20 miles from the nearest land, approved hinged watertight doors may be substituted for sliding doors providing such doors can be kept normally closed, except when actually being used for transit. Every space used by passengers or crew during the voyage shall have a vertical means of access independent of watertight doors. Sluice valves are not permitted in watertight bulkheads.

(k) Special consideration will be given to departures from the specific requirements of the regulations in this section when it can be shown that the special circumstances or arrangements warrant such departures.

(l) Any passenger vessel whose keel was laid before April 15, 1951, or any vessel converted to a passenger vessel before April 15, 1951, while normally required to essentially comply with a one-compartment standard of subdivision, is not subject to compliance with this standard or to the detail requirements of the regulations in this section to a greater extent than is found reasonable and practicable.

(R. S. 4405, 4417, 4426, 4490, 49 Stat. 1384, 54 Stat. 346, and sec. 5. (e), 55 Stat. 244, as amended; 46 U. S. C. 369, 375, 391, 404, 482, 483, 1333, and 50 U. S. C. 1275)

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

Section 60.57 is amended to read as follows:

§ 60.57 *Subdivision and watertight integrity of passenger vessels of less than 150 gross tons.* (a) Every mechanically propelled vessel of less than 150 gross tons, whether or not specifically required by paragraph (b) of this section to meet a one-compartment standard of subdivision, shall be fitted with not less than 3 transverse watertight bulkheads. On such a vessel operating not more than 15 miles from the mouth of bays or harbors, air tankage or other internal buoyancy sufficient to float the vessel when completely flooded may be substituted for the after two of the three required bulkheads, but a collision bulkhead extending to the weather deck shall be fitted on each vessel. The use of internal buoyancy shall not permit omission of bulkheads required by other regulations in this chapter dealing with machinery installations, etc.

(b) Every passenger vessel carrying more than 49 passengers or of more than 75 gross tons and less than 150 gross tons shall be subdivided so as to be capable of remaining afloat with positive stability with any one main compartment flooded.

(c) To be considered effective watertight bulkheads abaft the collision bulkheads shall be spaced not less than 10 feet plus 3 percent of the load water line length. The collision bulkhead shall be fitted not more than 19 feet plus 5 percent of the load water line length abaft the bow at the load water line and not less than 5 percent of the load water line length (5-foot minimum for steam vessels) abaft the bow at the load water line. Bulkheads in vessels of wood construction (except steam vessels) may be of wood.

(d) Watertight bulkheads shall not be stepped unless additional subdivision is provided in way of the step to maintain the same measure of safety as that secured by a plane bulkhead. If watertight bulkheads are recessed, either the recess shall be inboard from the vessel's side by at least one-fifth the beam amidships measured at right angles to the center line at the level of the load water line, or additional subdivision shall be provided in way of the recess to maintain the same measure of safety as that secured by a plane bulkhead. Where the vessel can withstand the flooding of the two adjacent compartments separated by a stepped or recessed bulkhead and no part of such bulkhead is nearer to either of the other bulkheads bounding the adjacent compartments than is permitted by paragraph (c) of this section, the step or recess will be acceptable.

(e) Permeability of machinery spaces shall be taken at 85 percent and

of all other spaces at 95 percent, except as follows:

(1) Tanks, chain lockers, and spaces normally filled with cargo, stores, mail, or baggage in the full load condition may be taken at a permeability of 60 percent.

(2) For purposes of calculating stability in the damaged condition, tanks or tight voids shall be taken either at 95 percent permeability or at zero permeability whichever results in the more severe requirement.

(f) In making subdivision calculations, the undamaged vessel is to be assumed floating at the maximum service draft and at a trim consistent therewith. Sinkage, trim, and heel after damage shall not be permitted beyond a margin line 3 inches below the top of the bulkhead deck at side. In the case of vessels, where the mean of the maximum sheer forward and aft is less than 12 inches, a modified margin line 3 inches below the top of the bulkhead deck at the ends of the vessel but lowered throughout its length so as to have a mean parabolic sheer of 12 inches is to be used. Where the bulkhead deck is not continuous the margin line shall be such as to give at least a standard of safety equivalent to the foregoing.

(g) Heel due to final unsymmetrical flooding shall be limited to fifteen degrees, except that under circumstances where such heel after damage may be deemed to constitute an undue hazard, the Commandant may require a lesser angle of heel. Equalizing arrangements, where required, shall not be dependent either upon manual or automatic operation of valves. Temporary heel prior to full equalization shall not be excessive.

(h) The bulkheads deck, or superstructure inclosing any portion thereof, shall be effectively weathertight. Adequate freeing arrangements shall be provided. On vessels having internal buoyancy, as permitted under paragraph (a) of this section, a bulkhead deck is not required.

(i) Portlights shall not be fitted below the margin line.

(j) Openings in watertight bulkheads shall be the minimum consistent with proper operation of the vessel and shall be located as high in the bulkheads and as far inboard as practicable. Watertight doors are not permitted in forepeak bulkheads. Watertight doors between cargo spaces or between cargo and working spaces will not ordinarily be permitted. Watertight doors within accommodation and working spaces shall in no case exceed five in number and shall be of approved hand-operated sliding type. On vessels which do not proceed more than 20 miles from the nearest land, approved hinged watertight doors may be substituted for sliding doors providing such doors can be kept normally closed except when actually being used for transit. Every space used by passengers or crew during the voyage shall have a vertical means of access independent of watertight doors. Sluice valves are not permitted in watertight bulkheads.

(k) Special consideration will be given to departures from the specific requirements of the regulations in this section when it can be shown that the special circumstances or arrangements warrant such departures.

(l) Any passenger vessel whose keel was laid before April 15, 1951, or any vessel converted to a passenger vessel before April 15, 1951, while normally required to essentially comply with a one-compartment standard of subdivision, is not subject to compliance with this standard or to the detail requirements of the regulations in this section to a greater extent than is found reasonable and practicable.

(R. S. 4405, 4417, 4426, 4490, 49 Stat. 1384, 54 Stat. 346, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391, 404, 482, 483, 1333, and 50 U. S. C. 1275)

Subchapter H—Great Lakes: General Rules and Regulations

PART 76—BOATS, RAFTS, BULKHEADS, AND LIFESAVING APPLIANCES

Section 76.57 is amended to read as follows:

§ 76.57 *Subdivision and watertight integrity of passenger vessels.* (a) Every mechanically propelled vessel, whether or not specifically required by this section to meet a one-compartment or better standard of subdivision, shall be fitted with not less than 3 transverse watertight bulkheads. On such a vessel operating not more than 15 miles from the mouth of bays or harbors, air tankage or other internal buoyancy sufficient to float the vessels when completely flooded may be substituted for the after two of the three required bulkheads, but a collision bulkhead extending to the weather deck shall be fitted on each vessel. The use of internal buoyancy shall not permit omission of bulkheads required by other regulations in this chapter dealing with machinery installations, etc.

(b) Every passenger vessel carrying more than 49 passengers or of more than 75 gross tons shall be so subdivided as to be capable of remaining afloat with positive stability with any one main compartment flooded.

(c) Every passenger vessel carrying more than 400 passengers shall, in addition, be so subdivided as to be capable of remaining afloat and with positive stability with the forepeak and the adjacent main compartment both flooded.

(d) Every passenger vessel carrying more than 600 passengers shall, in addition, be so subdivided as to be capable of remaining afloat and with positive stability with any two adjacent main compartments within at least the forward 40 percent of the vessel's length from the forward perpendicular flooded.

(e) Every passenger vessel carrying more than 800 passengers shall, in addition, be so subdivided as to be capable of remaining afloat and with positive stability with any two adjacent main compartments within at least 60 percent of the vessel's length from the forward perpendicular flooded.

(f) Every passenger vessel carrying more than 1,000 passengers shall, in addition, be so subdivided by main transverse watertight bulkheads as to be capable of remaining afloat and with positive stability with any two adjacent main compartments flooded.

(g) To be considered effective, water-tight bulkheads abaft the collision bulkhead shall be spaced not less than 10 feet plus 3 percent of the load waterline length. The collision bulkhead shall be fitted not more than 10 feet plus 5 percent of the load waterline length abaft the bow at the load waterline and not less than 5 percent of the load waterline length (5-foot minimum for steam vessels) abaft the bow at the load waterline. Bulkheads in vessels of wood construction (except steam vessels) may be of wood. On vessels of 150 gross tons or over, stern tubes shall be enclosed in watertight spaces. The stern glands shall be situated within a watertight shaft tunnel or other space of such volume that if flooded by leakage through the stern gland the margin line will not be submerged.

(h) Watertight bulkheads shall not be stepped unless additional subdivision is provided in way of the step to maintain the same measure of safety as that secured by a plane bulkhead. If watertight bulkheads are recessed, either the recess shall be inboard from the vessel's side by at least one-fifth the beam amidships measured at right angles to the centerline at the level of the load waterline, or additional subdivision shall be provided in way of the recess to maintain the same measure of safety as that secured by a plane bulkhead. Where the maximum molded beam at the deck and at the load waterline differ appreciably the inboard damage penetration may be assumed at a mean position between that corresponding to one-fifth the maximum molded beam at the deck measured inboard at the deck, and that corresponding to one-fifth the maximum molded beam at the load waterline

measured inboard at the load waterline. Where the vessel can withstand the flooding of the two adjacent compartments separated by a stepped or recessed bulkhead and no part of such bulkhead is nearer to either of the other bulkheads bounding the adjacent compartments than is permitted by paragraph (g) of this section the step or recess will be acceptable.

(i) Permeability of machinery spaces shall be taken at 85 percent and of all other spaces at 95 percent, except as follows:

(1) Tanks, chain lockers, and spaces normally filled with cargo, stores, mail, or baggage in the full load condition may be taken at a permeability of 60 percent.

(2) For purposes of calculating stability in the damage condition, tanks or tight voids shall be taken either at 95 percent permeability or at zero permeability whichever results in the more severe requirement.

(j) In making subdivision calculation, the undamaged vessel is to be assumed floating at the maximum service draft and at a trim consistent therewith. Sinkage, trim, and heel after damage shall not be permitted beyond a margin line 3 inches below the top of the bulkhead deck at side. In the case of vessels, where the mean of the maximum sheer forward and aft is less than 12 inches, a modified margin line 3 inches below the top of the bulkhead deck at the ends of the vessel but lowered throughout its length so as to have a mean parabolic sheer of 12 inches is to be used. Where the bulkhead deck is not continuous the margin line shall be such as to give at least a standard of safety equivalent to the foregoing.

(k) Heel due to final unsymmetrical flooding shall be limited to fifteen degrees, except that under circumstances where such heel after damage may be deemed to constitute an undue hazard, the Commandant may require a lesser angle of heel. Equalizing arrangements, where required, shall not be dependent either upon manual or automatic operation of valves. Temporary heel prior to full equalization shall not be excessive.

(l) The bulkhead deck, or superstructure inclosing any portion thereof, shall be effectively weathertight. Adequate freeing arrangements shall be provided. On vessels having internal buoyancy, as permitted under paragraph (a) of this section, a bulkhead deck is not required.

(m) Portlights shall not be fitted below the margin line.

(n) Openings in watertight bulkheads shall be the minimum consistent with proper operation of the vessel and shall be located as high in the bulkheads and as far inboard as practicable. Watertight doors are not permitted in forepeak bulkheads. Watertight doors between cargo spaces or between cargo and working spaces will not ordinarily be permitted. Watertight doors within accommodation and working spaces, and having their sills below the subdivision waterline, shall not exceed 5 in number and shall be of approved hand-operated sliding type. Where it can be shown that more than 5 such watertight doors are required they shall be of approved power operated sliding type. On vessels which do not proceed more than 20 miles from the nearest land, approved hinged watertight doors may be substituted for hand-operated sliding doors providing such doors can be kept normally closed except when actually being used for transit. Where watertight doors are required above a deck which, at its lowest point at side, is at least 7 feet above the subdivision waterline, such doors may be of approved hinged type. Every space used by passengers or crew during the voyage shall have a vertical means of access independent of watertight doors. Sluice valves are not permitted in watertight bulkheads.

(o) Special consideration will be given to departures from the specific requirements of the regulations in this section when it can be shown that the special circumstances or arrangements warrant such departures.

(p) Any passenger vessel whose keel was laid before April 15, 1951, or any vessel converted to a passenger vessel before April 15, 1951, if of more than 75 gross tons, is normally required to comply with a one-compartment standard of subdivision. Such a vessel, however, is not subject to compliance with a one-compartment standard, or to the detail requirements of the regulations in this section to a greater extent than is found reasonable and practicable.

PART 80—FERRYBOATS

Section 80.2 is amended to read as follows:

§ 80.2 *Subdivision and watertight integrity of ferry vessels.* (a) Every passenger ferry vessel shall be so subdivided by main transverse watertight bulkheads as to be capable of remaining afloat and with positive stability with any one main compartment flooded, unless provided with air tankage or other internal buoyancy sufficient to float the flooded vessel. The use of internal buoyancy shall not permit omission of bulkheads required by other regulations of this chapter dealing with machinery installation, etc.

(b) Every passenger ferry vessel above 150 feet in waterline length shall, in addition, be so subdivided as to be capable of remaining afloat and with positive stability with either of the peak compartments and its adjacent main compartment both flooded.

(c) Every passenger ferry vessel above 200 feet in waterline length shall, in addition, be so subdivided by main transverse bulkheads as to be capable of remaining afloat and with positive stability with any two adjacent main compartments flooded.

(d) (1) To be considered effective, watertight bulkheads between the peak bulkheads shall be spaced not less than 10 feet plus 3 percent of the load waterline length. The peak bulkheads shall be fitted not less than 5 percent of the load waterline length and not more than 10 feet plus 5 percent of the load waterline length from the ends of the vessel at the load waterline.

(2) On ferryboats of 150 gross tons or over, shaft tubes shall be enclosed in watertight spaces. The glands shall be situated within watertight shaft tunnels or other spaces of such volume that the flooding by leakage through either gland will not submerge the margin line.

(e) Watertight bulkheads shall not be stepped unless additional subdivision is provided in way of the step to maintain the same measure of safety as that secured by a plane bulkhead. If watertight bulkheads are recessed, either the recess shall be inboard from the vessel's side by at least one-fifth the beam amidships measured at right angles to the centerline at the level of the load waterline, or additional subdivision shall be provided in way of the recess to maintain the same measure of safety as that secured by a plane bulkhead. Where the maximum molded beam at the deck and at the load waterline differ appreciably the inboard damage penetration may be assumed at a mean position between that corresponding to one-fifth the maximum molded beam at the deck measured inboard at the deck, and that corresponding to one-fifth the maximum molded beam at the load waterline measured inboard at the load waterline. Where the vessel can withstand the flooding of the two adjacent compartments separated by a stepped or recessed bulkhead and no part of such bulkhead is nearer to either of the other bulkheads bounding the adjacent compartments than is permitted by paragraph (d) of this section, the step or recess will be acceptable.

(f) Permeability of machinery spaces shall be taken at 85 percent and of all other spaces at 95 percent,

except for purposes of calculating stability in the damaged condition, tanks or tight voids shall be taken either at 95 percent permeability or at zero permeability whichever results in the more severe requirement.

(g) In making subdivision calculations, the undamaged vessel is to be assumed floating at the maximum service draft and at a trim consistent therewith. Sinkage, trim, and heel after damage shall not be permitted beyond a margin line 3 inches below the top of the bulkhead deck at side. In the case of vessels, where the mean of the maximum sheer forward and aft is less than 12 inches, a modified margin line 3 inches below the top of the bulkhead deck at the end of the vessel but lowered throughout its length so as to have a mean parabolic sheer of 12 inches is to be used. Where the bulkhead deck is not continuous the margin line shall be such as to give at least a standard of safety equivalent to the foregoing.

(h) Heel due to final unsymmetrical flooding shall be limited to fifteen degrees, except that under circumstances where such heel after damage may be deemed to constitute an undue hazard, the Commandant may require a lesser angle of heel. Equalizing arrangements, where required, shall not be dependent either upon manual or automatic operation of valves. Temporary heel prior to full equalization shall not be excessive.

(i) The bulkhead deck, or superstructure enclosing any portion thereof, shall be effectively weathertight. Adequate freeing arrangements shall be provided. On vessels having internal buoyancy, as permitted under paragraph (a) of this section, a bulkhead deck is not required.

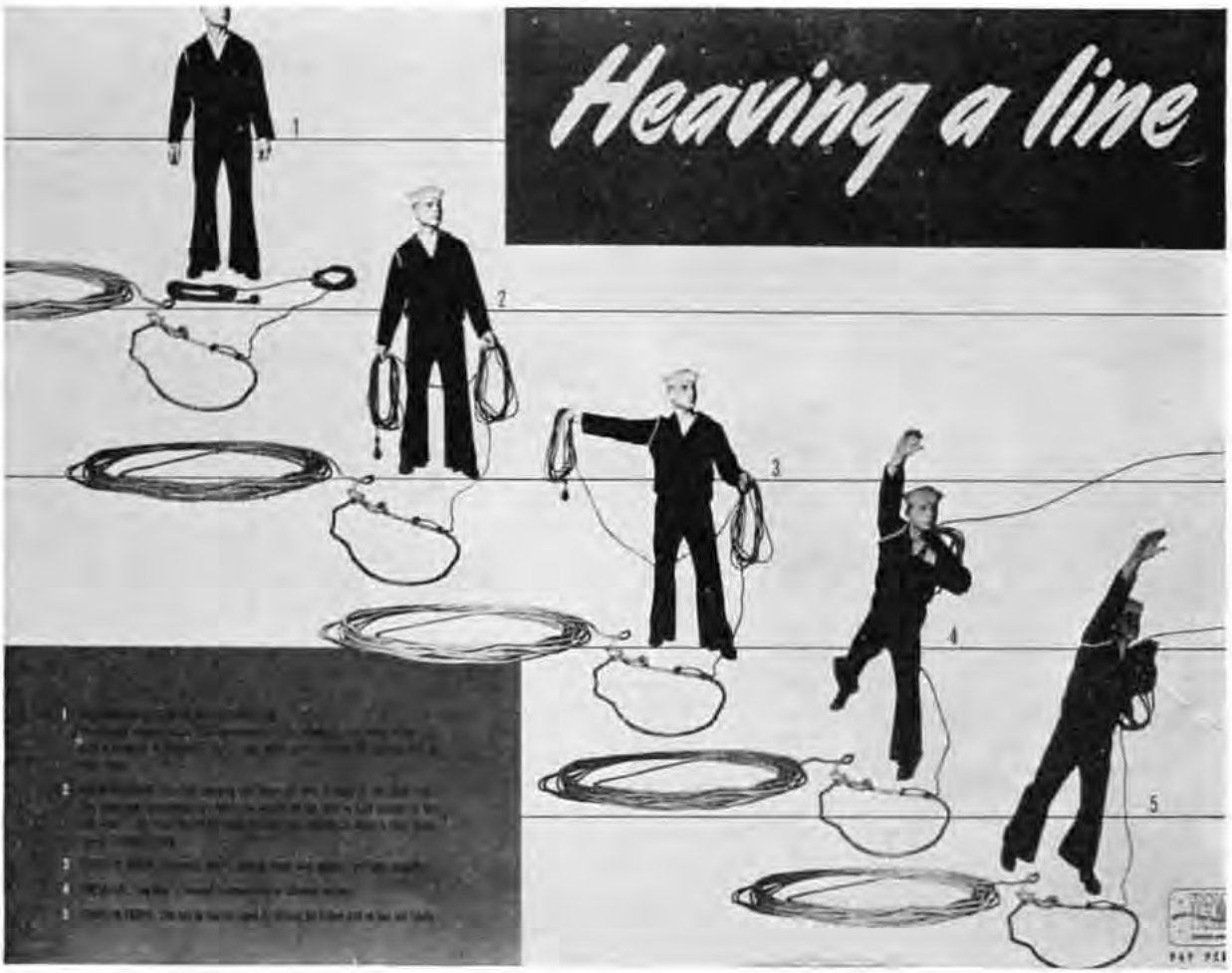
(j) Portlights shall not be fitted below the margin line.

(k) Openings in watertight bulkheads shall be the minimum consistent with proper operation of the vessel and shall be located as high in the bulkhead and so far inboard as practicable. Watertight doors are not permitted in peak bulkheads. Watertight doors within accommodation and working spaces shall be of approved hand-operated sliding type. However, doors which can be kept normally closed except when actually being used for transit, may be hinged doors of approved type. Every space used by passengers or crew during the voyage shall have a vertical means of access independent of watertight doors. Sluice valves are not permitted in watertight bulkheads.

(l) Special consideration will be given to departures from the specific requirements of the regulations in this part when it can be shown that the special circumstances or arrangements warrant such departures.

(m) Any passenger ferry vessel whose keel was laid before April 15, 1951, or any vessel converted to passenger ferry service before April 15, 1951, while normally required to essentially comply with a one-compartment standard of subdivision, is not subject to compliance with this standard or to the detail requirements of the regulations in this part to a greater extent than is found reasonable and practicable.

Note: This document will be continued in the May issue.



Equipment Approved by the Commandant

ELECTRICAL APPLIANCES

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	
Edwards & Co., Inc., Norwalk, Conn.:					
Vibrating bell, 8", watertight, 6, 20, 115, and 230V, DC, cat. no. 1770, dwg. no. 7844, alt. 1	x	x			1/10/51
Vibrating bell, 10", watertight, 6, 20, 115, and 230V, DC, cat. no. 1770, dwg. no. 7844-A, alt. 1	x	x			1/10/51
Vibrating bell, 6", watertight, 6, 20, 115, and 230V, DC, cat. no. 1770, dwg. no. 7844-B, alt. 1	x	x			1/10/51
Cow bell, watertight, 6, 20, 115, and 230V, DC, cat. no. 1770, dwg. no. 7844-C, alt. 1	x	x			1/10/51
Vibrating bell, 3", watertight, 24, 115, and 230V, AC, cat. no 1770, dwg. no. 7841, alt. 1	x	x			1/10/51
Vibrating bell, 4", 24, 115, and 230V, AC, cat. no. 1770, dwg. no. 7841-A, alt. 1	x	x			1/10/51
Buzzer, watertight, 20, 115, and 230V, DC, cat. no. 1770, dwg. no. 7844-F, alt. 0	x	x			1/10/51
Vibrating bell, 3", watertight, 20, 115, and 230V, DC, cat. no. 1770, dwg. no. 7844-D, alt. 0	x	x			1/10/51
Vibrating bell, 4", watertight, 20, 115, and 230V, DC, cat. no. 1770, dwg. no. 7844-E, alt. 0	x	x			1/10/51
Buzzer, watertight, 24, 115, and 230V, AC, cat. no. 1770, dwg. no. 7841-F, alt. 0	x	x			1/10/51
Vibrating bell, 6", watertight, 24, 115, and 230V, AC, cat. no. 1770, dwg. no. 7841-B, alt. 0	x	x			1/10/51
Vibrating bell, 8", watertight, 24, 115, and 230V, AC, cat. no. 1770, dwg. no. 7841-C, alt. 0	x	x			1/10/51
Vibrating bell, 10", watertight, 24, 115, and 230V, AC, cat. no. 1770, dwg. no. 7841-D, alt. 0	x	x			1/10/51
Cow bell, watertight, 24, 115, and 230V, AC, cat. no. 1770, dwg. no. 7841-E, alt. 0	x	x			1/10/51
Empire Switchboard Co., New York, N. Y.:					
Enclosed safety switches, quick-break, externally operable, 2-pole, 125 and 250V, AC and DC, 30 to 200 amperes, fused and unfused, dwg. no. S-7150, alt. 1	x	x			12/20/50
Henschel Corp., Amesbury, Mass.:					
Vibrating bells and buzzer, 3", 4", 6", and 8" sizes, fused (for installation above bulkhead deck only) AC & DC, 240V max., dwg. no. 20-162-F, alt. 1	x	x	x		1/10/51
Lovell-Dressel Co., Inc., Arlington, N. J.:					
Ceiling fixture, non-watertight, 2 50-watt lamps max., cat. no. 1568, dwg. no. M-5387, alt. 0	x				1/ 4/51
McDonnell & Miller, Inc., Chicago, Ill.:					
Pump control and low water cut-off switch, dwg. no. 154-S, ¾ HP, 115-230V, AC, ¾ HP, 115V DC, 150 p. s. i. max., with bronze housing	x	x			12/ 6/50

CHANGE IN NAME

The records of all drawings covering "Miscellaneous Electrical Equipment Satisfactory for Use on Merchant Vessels" and manufactured by The Dayton Manufacturing Co., Dayton 1, Ohio, has been changed at the company's request and should now be listed as manufactured by E. W. Mink and Associates, Inc., 117 North Findlay Street, Dayton 3, Ohio.

[CGFR 50-41]

By virtue of the authority vested in me as Commandant, United States Coast Guard, by Treasury Department Order No. 120, dated July 31, 1950 (15 F. R. 6521), 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:

BUOYANT CUSHIONS, KAPOK, STANDARD

NOTE: Cushions are for use on motorboats of Classes A, 1, or 2, not carrying passengers for hire.

Approval No. 160.007/97/0, Standard kapok buoyant cushion, U. S. C. G. Specification Subpart 160.007, manufactured by Iowa Fibre Products, Inc., Des Moines 9, Iowa.

Approval No. 160.007/98/0, Standard kapok buoyant cushion, U. S. C. G. Specification Subpart 160.007, manufactured by Crawford Cushion Mfg. Co., 1081 West View Drive SW., Atlanta, Ga.

Approval No. 160.007/99/0, Standard kapok buoyant cushion, U. S. C. G. Specification Subpart 160.007, manufactured by Sound Mattress and Felt Co., South Thirtieth and Hosmer Streets, Tacoma, Wash.

(R. S. 4405, 4491, 54 Stat. 164, 166, as amended; 46 U. S. C. 375, 489, 526e, 526p; 46 CFR 25.4-1, 160.007)

BUOYANT CUSHION, NON-STANDARD

NOTE: Cushions are for use on motorboats of Classes A, 1, or 2, not carrying passengers for hire.

Approval No. 160.008/438/0, 15" x 15" x 2" rectangular buoyant cushion, 20 oz. kapok, unsupported plastic film covering and straps, dwg. No. 1, dated September 27, 1950, manufactured by Stearns Manufacturing Co., West Division Street at Thirtieth, St. Cloud, Minn.

(R. S. 4405, 4491, 54 Stat. 164, 166, as amended; 46 U. S. C. 375, 489, 526e, 526p; 46 CFR 25.4-1, 160.008)

SIGNALS, DISTRESS, FLARE, RED, HAND

Approval No. 160.021/6/0, Hand red flare distress, 500 candlepower, 2-minute burning time, identified by General Arrangement dwg. No. CXC-115, dated April 18, 1949, and Detail dwg. No. CXC-116, dated April 16, 1949, submitted by International Flare Signal Division of Kilgore Manufacturing Co., Westerville, Ohio.

(R. S. 4405, 4417a, 4426, 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, 481, 489, 1333, 50 U. S. C. 1275; 46 CFR 160.021)

CONTAINERS, EMERGENCY PROVISIONS AND WATER

Approval No. 160.026/12/0, Container for emergency provisions, dwg. No. 201-P dated August 21, 1950, Specification 201-S, dated August 21, 1950, manufactured by Globe Equipment Corp., 30-32 Gold Street, Brooklyn 1, N. Y.

(R. S. 4405, 4417a, 4426, 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, 59.11)

MECHANICAL DISENGAGING APPARATUS, LIFEBOAT

Approval No. 160.033/42/0, Rottmer type, size 0.1, releasing gear, approved for maximum working load of 14,000 pounds per set (7,000 pounds per hook), identified by assembly and

calculations dwg. No. R–124 dated November 5, 1949, and revised February 23, 1950, manufactured by the Lane Lifeboat & Davit Corp., Foot of Fortieth Road and Flushing River, Flushing, N. Y.

(R. S. 4405, 4417a, 4426, 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, 481, 489, 1333, 50 U. S. C. 1275; 46 CFR 37.1–7, 59.68, 76.62, 94.59, 160.033)

LIFEBOATS

Approval No. 160.035/126/1, 16.0′ x 6.0′ x 2.67′ steel, oar-propelled lifeboat, 15-person capacity, identified by general arrangement dwg. No. 16–6–15–2, dated April 22, 1950, manufactured by Frank Morrison & Son Co., Cleveland, Ohio. (Supersedes Approval No. 160.035/126/0, published in the Federal Register dated July 31, 1947.)

DANGER

NO JOB IS SO IMPORTANT
NO WORK IS SO URGENT
THAT WE CAN NOT TAKE TIME
TO PERFORM OUR WORK SAFELY

Approval No. 160.035/247/1, 24.0′ x 8.0′ x 3.75′ steel, motor-propelled lifeboat without radio cabin, 40-person capacity, identified by construction and arrangement dwg. No. 24–1C, dated April 28, 1949, and revised September 18, 1950, manufactured by Marine Safety Equipment Corp., Point Pleasant, N. J. (Supersedes Approval No. 160.035/247/0, published in the Federal Register dated November 3, 1949.)

(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 37.1–1, 59.13, 76.16, 94.15, 113.10, 160.035)

JACKKNIFE (WITH CAN OPENER)

Approval No. 160.043/1/0, Type S702 jackknife (with can opener), dwg. No. 1160, dated August 11, 1950, manufactured by Camillus Cutlery Co., Camillus, N. Y.

(R. S. 4405, 4417a, 4488, 4491, 49 Stat. 1544, 54 Stat. 346, 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391a, 481, 489, 1333, 50 U. S. C. 1275; 46 CFR 160.043)

TELEPHONE SYSTEMS, SOUND POWERED

Approval No. 161.005/40/0, Telephone station relay, non-latching type, splash-proof, dwg. No. 18, Alt. 1, dated March 1950, manufactured by Hose-McCann Telephone Co., Inc., Twenty-fifth Street and Third Avenue, Brooklyn 32, N. Y.

(R. S. 4405, 4417a, 4418, 4426, 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, 489, 1333, 50 U. S. C. 1275; 46 CFR 32.9–4, 63.11, 79.12, 97.14, 116.10)

FLAME ARRESTERS FOR TANK VESSELS

Approval No. 162.016/30/1, Oceco Type E–21–B flame arrester, cast iron body, extensible bank assembly, aluminum arrester plates, bolted end covers, dwg No. HOC–195–A, revised November 10, 1950, approved for sizes 3″, 4″, 6″, 8″ and 10″, manufactured by The Johnston & Jennings Co., 4700 West Division Street, Chicago 51, Ill. (Supersedes Approval No. 162.016/30/0, published in the Federal Register dated August 6, 1948.)

(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 162.016)

GAS CONSUMING APPLIANCES; LIQUIFIED PETROLEUM

Approval No. 162.020/37/0, South Bend Model No. 3000–A liquefied gas burning range, approved by the American Gas Association, Inc., under Certificate No. 11–44–1.101, manufactured by The Malleable Steel Range Manufacturing Co., Inc., South Bend 21, Ind.

Approval No. 162.020/38/0, South Bend Model No. 3003–A liquefied gas burning range, approved by the American Gas Association, Inc., under Certificate No. 11–44–1.101, manufactured by The Malleable Steel Range Manufacturing Co., Inc., South Bend 21, Ind.

Approval No. 162.020/39/0, South Bend Model No. 3020–A liquefied gas burning range, approved by the American Gas Association, Inc., under Certificate No. 11–44–1.101, manufactured by The Malleable Steel Range Manufacturing Co. Inc., South Bend 21, Ind.

Approval No. 162.020/40/0, South Bend Model No. 3020–A liquefied gas burning range, approved by the American Gas Association, Inc., under Certificate No. 11–44–1.101, manufactured by The Malleable Steel Range Manufacturing Co., Inc., South Bend 21, Ind.

Approval No. 162.020/41/0, South Bend Model No. 3025–A liquefied gas burning range, approved by the American Gas Association, Inc., under Certificate No. 11–44–1.101, manufactured by The Malleable Steel Range Manufacturing Co., Inc., South Bend 21, Ind.

Approval No. 162.020/42/0, Magic Chef gas range, Model No. HD–12, approved by the American Gas Association, Inc., under Certificate No. 11–22–9.901 for liquefied petroleum gas service, manufactured by the American Stove Co., 4931 Daggett Avenue, St. Louis 10, Mo.

Approval No. 162.020/44/0, Magic Chef gas range, Model No. HD–15, approved by the American Gas Association, Inc., under Certificate No. 11–22–9.901 for liquefied petroleum gas service, manufactured by the American Stove Co., 4931 Daggett Avenue, 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)

Dated: January 15, 1951.

[SEAL] MERLIN O'NEILL,
Vice Admiral, U. S. Coast Guard, Commandant.

[F. R. Doc. 51–913; Filed Jan. 18, 1951; 8:49 a. m.; 16 F. R. 508–1/19/51]

[CGFR 51–7]

By virtue of the authority vested in me as Commandant, United States Coast Guard, by Treasury Department Order No. 120, dated July 31, 1950 (15 F. R. 6521), 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:

CLEANING PROCESS FOR LIFE PRESERVERS

[Where buoyancy fillers are not removed from envelope covers during cleaning process]

Approval No. 160.006/20/0, U. S. Cleaners and Dyers cleaning process for kapok life preservers, as outlined in description of cleaning process, dated December 23, 1950, from U. S. Cleaners and Dyers, Inc., 716 Washington Street, Hoboken, N. J.

(R. S. 4405, 4417a, 4426, 4482, 4488, 4491, sec. 11, 35 Stat. 428, 49 Stat. 1544, 54 Stat. 164, 166, 346, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 375, 391, 396, 404, 475, 481, 489, 526e, 526p, 1333, 50 U. S. C. 1275; 46 CFR 160.006)

WINCHES, LIFEBOAT

Approval No. 160.015/45/0, Type CL–17.5 lifeboat winch, approved for maximum working load of 17,500 pounds pull at the drums (8,750 pounds per fall), for use on the S. S. "Constitution" and S. S. "Independence" only, identified by assembly dwg. No. CL–17.5–1, Alt. C, dated April 4, 1950, manufactured by Marine Safety Equipment Corp., Point Pleasant, N. J.

Approval No. 160.015/56/0, Type CL–17.5A lifeboat winch, approved for maximum working load of 11,500

pounds pull at the drums (5,750 pounds per fall), for use on the S. S. "Constitution" and S. S. "Independence" only, identified by assembly dwg. No. CL–17.5–1, Alt. C, dated April 4, 1950, manufactured by Marine Safety Equipment Corp., Point Pleasant, N. J.

(R. S. 4405, 4417a, 4426, 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, 481, 489, 1333, 50 U. S. C. 1275; 46 CFR 37.1–5, 59.3a, 60.21, 76.15a, 94.14a, 160.015)

LIFEBOATS

Approval No. 160.035/178/2, 16.0' x 5.5' x 2.37' steel, oar-propelled lifeboat, 12-person capacity, identified by Construction and Arrangement dwg. No. 16–1, dated January 31, 1947, and revised November 29, 1950, submitted by Marine Safety Equipment Corp., Point Pleasant, N. J. (Supersedes Approval No. 160.035/178/1, published in the Federal Register February 8, 1949.)

Approval No. 160.035/208/1, 12.0' x 4.42' x 1.92' steel, oar-propelled lifeboat, 6-person capacity, identified by Construction and Arrangement dwg. No. 12–1, dated November 5, 1947, and revised November 30, 1950, submitted by Marine Safety Equipment Corp., Point Pleasant, N. J. (Supersedes Approval No. 160.035/208/0, published in the Federal Register May 15, 1948.)

Approval No. 160.035/222/1, 24.0' x 8.0' x 3.73' steel, motor-propelled lifeboat without radio cabin, 37-person capacity, identified by Construction and Arrangement dwg. No. 24–1B, dated May 5, 1948, and revised September 28, 1950, submitted by Marine Safety Equipment Corp., Point Pleasant, N. J. (Supersedes Approval No. 160.035/222/0, published in the Federal Register May 17, 1949.)

Approval No. 160.035/270/0, 16.0' x 5.0' x 2.08' steel, oar-propelled lifeboat, 10-person capacity, identified by Construction and Arrangement dwg. No. 16–2, dated August 1, 1950, revised December 12, 1950, manufactured by Marine Safety Equipment Corp., Point Pleasant, 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 37.1–1, 59.13, 76.16, 94.15, 113.10, 160.035)

LIGHTS (WATER): ELECTRIC, FLOATING, AUTOMATIC

Approval No. 161.001/3/1, automatic floating electric water light (with bracket for mounting) dwg. No. 606, Alt. 2, dated October 30, 1950, manufactured by Pomill Manufacturing Corp., 17 Battery Place, New York 4, N. Y. (Supersedes Approval No. 161.001/3/0, published in the Federal Register March 25, 1950.)

(R. S. 4405, 4417a, 4426, 4488, 4491, 49 Stat. 1544, 54 Stat. 346, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 404, 481, 1333, 50 U. S. C. 1275; 46 CFR 161.001)

VALVES, RELIEF (FOR HOT WATER HEATING BOILERS)

Approval No. 162.013/4/0, Type No. 175 relief valve for hot-water heating boilers, maximum set pressure 30 pounds per square inch, relieving capacity 175,000 B. t. u. per hour, dwg. No. RA–11 dated January 12, 1950, inlet size ¾", manufactured by Bell & Gossett Co., 8200 North Austin Avenue, Morton Grove, Ill.

Approval No. 162.013/5/0, Type No. 250 relief valve for hot-water heating boilers, maximum set pressure 30 pounds per square inch, relieving capacity 250,000 B. t. u. per hour, dwg. No. RA1–12 dated January 6, 1950, inlet size ¾", manufactured by Bell & Gossett Co., 8200 North Austin Avenue, Morton Grove, Ill.

Approval No. 162.013/6/0, Type No. 499 relief valve for hot-water heating boilers, maximum set pressure 30 pounds per square inch, relieving capacity 500,000 B. t. u. per hour, dwg. No. RA–13 dated July 13, 1950, inlet size ¾", manufactured by Bell & Gossett Co., 8200 North Austin Avenue, Morton Grove, Ill.

Approval No. 162.013/7/0, Type No. 1000 relief valve for hot-water heating boilers, maximum set pressure 30 pounds per square inch, relieving capacity 1,000,000 B. t. u. per hour, dwg. No. RSA–1000 dated March 30, 1950, inlet size 1½", manufactured by Bell & Gossett Co., 8200 North Austin Avenue, Morton Grove, Ill.

(R. S. 4405, 4417a, 4418, 4426, 4433, 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, 489, 1333, 50 U. S. C. 1275; 46 CFR 53.03–60)

GAS CONSUMING APPLIANCES, LIQUIFIED PETROLEUM

Approval No. 162.020/43/0, Magic Chef gas range, Model No. HD–14, approved by the American Gas Association, Inc., under Certificate No. 11–22–5.901, Supplement Serial No. 5, dated January 18, 1950, for liquefied petroleum gas service, manufactured by the American Stove Co., 4931 Daggett Avenue, 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; 56 CFR 32.9–11, 61.25, 95.24, 114.25)

INCOMBUSTIBLE MATERIALS

Approval No. 164.009/27/0, Soft-Flex glass fabrics, fibrous glass type decorative fabrics identical to those described in National Bureau of Standards Report No. TG 10210–1735; FP 2980 (Test Folder G–4251), dated December 1, 1950, manufactured by Soft-Flex Glass Fabrics Corp., 1012 North Highland Avenue, Los Angeles 38, Calif.

(R. S. 4405, 4417a, 4426, 49 Stat. 1384, 1544, 54 Stat. 1028, sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 369, 375, 391a, 404, 463a, 50 U. S. C. 1275; 46 CFR 164.009)

Dated: February 13, 1951.

[SEAL] MERLIN O'NEILL,
Vice Admiral U. S. Coast Guard,
Commandant.

[F. R. Doc. 51–2397; Filed, Feb. 16, 1951; 8:48 a. m.; 16 F. R. 1685, Feb. 17, 1951

[CGFR 50–42]

TERMINATION OF APPROVAL OF EQUIPMENT

By virtue of the authority vested in me as Commandant, United States Coast Guard, by Treasury Department Order No. 120, dated July 31, 1950 (15 F. R. 6521), and in compliance with the authorities cited below, the following approvals of equipment are terminated because the items of equipment covered are no longer being manufactured:

BUOYANT CUSHIONS, KAPOK, STANDARD

NOTE: Cushions are for use on motorboats of classes A, 1, or 2 not carrying passengers for hire.

Termination of Approval No. 160.007/84/0, Standard kapok buoyant cushion, U. S. C. G. Specification Subpart 160.007, manufactured by Marietta Cushion Co., Marietta, Ga. (Approved Federal Register July 27, 1949.)

(R. S. 4405, 54 Stat. 164, 166; 46 U. S. C. 526e, 526p; 46 CFR 25.4–1, 160.007)

FLAME ARRESTERS FOR TANK VESSELS

Termination of Approval No. 162.016/7/0, Type A–20, Oceco flame arrester, cast iron body, aluminum bank assembly, dwg. No. 11885 dated January 30, 1940, approved for 2½" and above, for use with combustible or inflammable liquids of Grade A or lower, manufactured by The Johnston & Jennings Co., 877 Addison Road, Cleveland, Ohio. (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 162.016)

VALVES, PRESSURE VACUUM RELIEF

Termination of Approval No. 162.017/6/1, Oceco Type T pressure vacuum relief valve, weight loaded, atmospheric pattern, outlets fitted with flame screens, cast iron body, aluminum valves and guide rods, spindle-guided valves, without flame snuffer, dwg. No. 12811 dated June 8,

1948, approved for sizes 3" and 4" for use with inflammable or combustible liquids of Grade A and lower grades, manufactured by The Johnston & Jennings Co., 877 Addison Road, Cleveland, Ohio. (Approved Federal Register August 6, 1948.)

Termination of Approval No. 162.017/55/0, Oceco Type V–113 pressure-vacuum relief valve, weight loaded, atmospheric pattern, outlets fitted with flame screens, semi-steel body, aluminum valves and guide rods, spindle-guided valves, without flame snuffer, dwg. No. FOC–69 dated June 30, 1948, approved for sizes 3", 4", 6", 8", 10", and 12" for use with inflammable or combustible liquids of Grade A and lower grades, manufactured by The Johnston & Jennings Co., 877 Addison Road, Cleveland, Ohio. (Approved Federal Register August 6, 1948.)

(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 162.017)

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: January 15, 1951.

[SEAL] MERLIN O'NEILL,
Vice Admiral, U. S. Coast Guard,
Commandant.

[F. R. Doc. 51-916; Filed, Jan. 18, 1951; 8:50 a. m.; 16 F. R. 509—1/19/51]

[CGFR 51–3]

WITHDRAWAL OF APPROVAL NO. 160.007/75/0 FOR BUOYANT CUSHION

MERCHANT MARINE COUNCIL HEARING

1. The certificate of Approval No. 160.007/75/0 for a standard kapok buoyant cushion manufactured by the Hirsch-Weiss Canvas Products Co., Portland, Oregon, was suspended November 7, 1950, for noncompliance with requirements of Coast Guard regulations and the company was ordered to terminate the production of buoyant cushions under that approval number immediately, and the company was requested to state what action would be taken for recalling and withdrawing from service those buoyant cushions which were on the market and which might be of doubtful buoyant quality. The Hirsch-Weiss Canvas Products Co. indicated no action would be taken for removing from the market buoyant cushions which may be of unreliable buoyant quality and not manufactured in accordance with Coast Guard requirements. The standard kapok buoyant cushion manufactured under Approval No. 160.007/75/0 was approved for use on motorboats of Classes A, 1, or 2, not carrying passengers for hire in accordance with the Motorboat Act of April 25, 1940 (46 U. S. C. 526e), and 46 CFR 25.4–1 and 160.007. Since the buoyant cushions manufactured under certificate of Approval No. 160.007/75/0 were manufactured with kapok filler having doubtful buoyant qualities, it is necessary for safety of life at sea that certificate of Approval No. 160.007/75/0 be withdrawn from use and, therefore, all such buoyant cushions shall be removed from and not used on motorboats of Classes A, 1, or 2 as lifesaving devices.

2. *It is therefore ordered*, That Approval No. 160.007/75/0 shall be withdrawn effective November 7, 1950, and it is further ordered that all buoyant cushions bearing Approval No. 160.007/75/0 shall not be used as a lifesaving device on board motorboats of Classes A, 1, or 2, not carrying passengers for hire: *Provided, however*, That owners or operators of motorboats shall have until May 1, 1951, to replace such cushions with others of an approved type before being subject to any of the penalties of the Motorboat Act of 1940 (46 U. S. C. 526o).

3. Any person aggrieved by the withdrawal of Approval No. 160.007/75/0 may submit a written brief setting forth all pertinent facts and may request a hearing to the Commandant (CMC), U. S. Coast Guard, Washington 25, D. C., prior to January 30, 1951, so that a hearing, if requested, may be scheduled for the Merchant Marine Council on January 30 or 31, 1951.

Dated: January 15, 1951.

[SEAL] MERLIN O'NEILL,
Vice Admiral, U. S. Coast Guard,
Commandant.

[F. R. Doc. 51-914; Filed, Jan. 18, 1951; 8:50 a. m.; 16 F. R. 509—1/19/51]

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.

Babcock & Wilcox Co., The, 85 Liberty Street, New York 6, N. Y. *The Babcock & Wilcox Co.* (manufacturer). B & W Croloy, 2¼ (2¼Cr-1Mo) E7015.

OPERATING POSITIONS AND ELECTRODE SIZES

The type E7015 $\frac{3}{32}$", $\frac{1}{8}$" and $\frac{5}{32}$" diameter electrodes will be allowed for all position welding on direct and reverse polarity currents. The $\frac{3}{16}$" diameter electrode will be allowed for horizontal fillet and flat position welding on direct and reverse polarity currents. (Stress relieved.)

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 January 15, 1951, to February 15, 1951, is as follows:

The Lunkenheimer Co., P. O. Box 360 Annex Station, Cincinnati 14, Ohio. Heat No. 378.

AFFIDAVITS

The following affidavit was accepted during the period from January 15, 1951 to February 15, 1951:

Hawley Forge & Manufacturing Co., Jerrold & Barneveld Streets, San Francisco, Calif. Flanges, forgings, and fittings.

Merchant Marine Personnel Statistics

INVESTIGATING UNITS

Coast Guard Merchant Marine Investigating Units and Merchant Marine Details investigated a total of 468 cases during the month of January 1951. From this number, hearings, before examiners resulted involving 7 officers and 37 unlicensed men. In the case of officers, 1 license was revoked, none were suspended, 3 were suspended with probation granted, 1 was voluntarily surrendered, 3 cases were dismissed after hearing, and no hearings were closed with an admonition. Of the unlicensed personnel 4 certificates were revoked, 9 were suspended, 19 were suspended with probation granted, 11 were voluntarily surrendered without hearing, 4 were closed with an admonition, and 2 were dismissed after hearing.

MERCHANT MARINE LICENSES ISSUED DURING JANUARY 1951

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	13	87	4	22	0	7	5	83	22	177
	Coastwise	2	8	0	2	0	1	2	1	4	12
	Great Lakes	0	4	0	1	24	75	0	2	24	82
	B. S. & L	9	33	0	5	0	0	1	12	10	50
	Rivers	0	1	0	5	6	9	0	2	6	17
Chief mate	Ocean	13	25	6	7	0	3	7	19	26	54
	Coastwise	1	0	1	2	0	0	0	0	2	2
Second mate	Ocean	11	24	5	13	1	5	8	33	25	75
	Coastwise	0	0	0	0	0	0	0	0	0	0
Third mate	Ocean	9	37	4	13	1	8	9	33	23	91
	Coastwise	0	0	0	0	0	0	0	0	0	0
	Great Lakes	0	0	0	0	0	0	0	0	0	0
Mate	B. S. & L	0	3	0	1	0	0	2	2	2	6
	Rivers	0	0	1	1	5	5	0	0	6	6
Pilots	B. S. L & R	69	95	14	24	94	128	24	76	201	323
Master	Uninspected vessels	0	1	0	0	0	0	5	3	5	4
Mate	Uninspected vessels	0	0	0	0	0	0	2	0	2	0
Total		127	318	35	96	131	241	65	266	358	921
Grand total		445		131		372		331		1279	

ENGINEER OFFICERS

Steam	Chief engineer:										
	Unlimited	8	79	4	34	3	20	3	77	18	210
	Limited	2	35	1	8	11	80	0	7	14	130
	First assistant engineer:										
	Unlimited	13	38	5	7	8	9	6	32	32	86
	Limited	1	1	0	1	9	19	0	2	10	23
	Second assistant engineer:										
	Unlimited	14	42	4	14	10	21	8	34	36	111
	Limited	1	0	0	0	15	17	0	30	16	47
	Third assistant engineer:										
	Unlimited	10	75	6	16	5	31	13	29	34	151
	Limited	0	1	1	0	6	0	0	5	7	6
Motor	Chief engineer:										
	Unlimited	0	20	1	5	1	4	0	15	2	44
	Limited	7	26	5	9	5	13	4	7	21	55
	First assistant engineer:										
	Unlimited	1	3	0	0	0	1	0	3	1	7
	Limited	4	4	0	0	2	0	0	0	6	4
	Second assistant engineer:										
	Unlimited	1	6	0	0	0	1	0	28	1	35
	Limited	0	0	0	0	0	0	0	0	0	0
	Third assistant engineer:										
	Unlimited	2	72	0	10	0	22	2	9	4	113
	Limited	0	0	0	0	0	0	0	0	0	0
Uninspected vessels	Chief engineer	0	0	1	0	0	0	4	12	5	12
	Assistant engineer	0	0	0	0	0	0	0	4	0	4
Total		64	402	28	104	75	238	44	290	211	1034
Grand total		466		132		313		334		1245	

RADIO OFFICERS

Total	29

ORIGINAL SEAMEN'S DOCUMENTS ISSUED MONTH OF JANUARY 1951

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	15	5	97	168	29	3	.....	.....	2	95	91	4	66	10
Gulf coast	3	11	61	57	8	1	1	1	.....	27	37	.....	57	10
Pacific coast	15	.....	125	42	21	.....	.....	.....	.....	30	50	2	109	3
Great Lakes and rivers	.....	2	46	48	17	20	.....	.....	.....	19	42	.....	35	8
Total	33	18	329	315	75	24	1	1	2	171	220	6	267	31

[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.

U. S. GOVERNMENT PRINTING OFFICE: 1951


heaving the lead
1-THE STANCE
The leadsman standing in the chains grasps the toggle preparatory to heaving.
2-THE WINDUP
The lead is swung slowly forward and backward parallel to the side of the ship in an increasing arc. As the arc approaches 180° the lead is swung upward and around in a circular motion to develop momentum.
3-THE HEAVE
When the windup has developed sufficient speed, the hand releases the toggle as the lead swings forward.
4-THE PAYOFF
With the lead resting on the bottom, the depth is read when the ship brings the line vertical.