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CONTENTS

The Cover: A modern lightship proceeding to her station.

COUNCIL ACTIVITIES

THE regulation setting forth the requirements for an operator's license for motorboats carrying passengers for hire has been modified and recommended for approval to the Commandant. As modified, it provides that an applicant for such a license who holds a currently valid license as master, pilot, or other deck officer may be granted an operator's license without being required to take a professional examination if recent service under his license can be shown. Such applicant will not be required to surrender his other license in obtaining the operator's license.

The rescission of subchapter O resulted in the automatic deletion of section 151.23 of that subchapter. The section referred to permitted the use of steel plate flanges in class II piping. It being considered desirable to retain the practices permitted by that section, the Council recommended that the flange standards in general be brought into conformity with what is now accepted as current practice. Accordingly, a change in section 55.19–8 (e), subchapter F, was recommended to accomplish this.

A proposal to require that lifeboats on ocean and coastwise vessels be equipped with sails of dimensions and of canvas number to be fixed by the length of the lifeboat was considered by the Council. It was decided to retain the present regulation which requires that the boat be equipped with a mast or masts with at least one good sail and proper gear for each.

The regulations applicable to mechanically propelled vessels fitted with steam or inert-gas fire-extinguishing systems were clarified. As now written they require that lamp lockers, oil rooms, and like compartments shall be wholly and tightly lined with metal. This raised a question of whether ventilating ducts could be run into these compartments. As amended the regulations provide that adequate means for ventilating such compartments may be provided if suitable dampers capable of being operated from outside the spaces are fitted in each vent duct.

The Council recommended the adoption of regulations applicable to ferryboats. These require that automobiles and other motor vehicles shall be stowed in such manner as to permit both passengers and operators to get out and away from them freely in the event of fire or other disaster. Where there is insufficient clearance to provide such easy egress, spaces for such vehicle passengers shall be set aside on the boat for them. The regulations also require that the master take all necessary precautions to see that the motors of all vehicles are turned off when not needed for purpose of boarding or leaving the ferry.

Members of the Council will meet with members of the Western Rivers Panel on November 27, 1945 at St. Louis, Mo., at which time discussion will be had on the Western Rivers Pilot Rules and on regulations affecting vessels operating on those waters.

Investigation of Welded Vessels

IN April 1943, the Secretary of the Navy appointed a Board to Investigate the Design and Methods of Construction of Welded Steel Merchant Vessels, consisting of Rear Admiral Harvey F. Johnson, U. S. C. G., chairman, Vice Admiral H. L. Vickery, U. S. N., Vice Admiral E. L. Cochrane, U. S. N., and Mr. David Arnott, vice president-chief surveyor, American Bureau of Shipping. Extracts from the first report of this Board were published in the Proceedings of the Merchant Marine Council.

In August 1944, the Board appointed a Research Advisory Committee under the chairmanship of Mr. G. S. Mikhalapov of the National Research Council War Metallurgy Committee. The first report of this committee was contained in the second interim report of the Board and is of such interest that it is quoted herewith.

INTRODUCTION

As a result of structural failures of welded ships numerous research investigations were started at the instigation of the Board convened April 20, 1943, by the Secretary of the Navy to investigate the design and methods of construction of welded steel merchant vessels, and by other governmental and private agencies to determine the relative importance of the various factors which at that time were thought to contribute to those failures.

The research investigations which have been undertaken to determine the cause, or causes, of failure in welded steel ships may be classified as follows:

1. Design.
2. Materials.
3. Fabrication.

The Research Advisory Committee, appointed to take cognizance of, coordinate, and evaluate all research work which is considered to have a bearing on the problem, hereby attempts for the first time to evaluate the results of these investigations.

In presenting this summary, the committee desires to draw attention to the fact that the majority of the results obtained to date deal with the subject of fabrication and in particular with that of residual welding stresses. This emphasis on residual welding stresses reflects the importance which was attached to this subject by the majority of the technical personnel in the industry, when the research program was initiated, whereas the full significance of the type of fracture encountered in ship failures was not recognized until recently. The studies now under way on materials have not proceeded to the point where final conclusions based on complete test data may be presented, even though during the last 6 months greater emphasis has been placed on the investigations of materials.

DISCUSSION OF RESULTS

1. *Design.*—Full scale tests on welded ships have corroborated earlier experiments in riveted ships and confirmed the validity of the basic analytical methods in calculating the stresses in the main hull girder. Application of this method to present welded ships indicates a general level of stresses comparable to those of riveted ships. There are several research projects which have contributed significantly to design details. These projects have investigated stress distributions on board ship during loading and at sea, around such structural discontinuities as hatch corners, and much experimental data are at present being analyzed. In one investigation a strain concentration of seven was measured at sea. This unexpectedly high value is of great significance and warrants considerable additional research.

2. *Materials.*—A substantial random selection consisting of 257 samples of steel was collected from the stock and scrap piles of shipyards constructing merchant vessels. One thousand and twenty-eight tensile tests from these samples indicated that practically all of this steel complied with existing specifications for physical properties.

Notched-bar impact tests on rimmed, semikilled and fully killed grades of ship steel have shown that the transition from ductile to brittle behavior occurs at a relatively low temperature for fully killed steel, at a temperature as high as 90° F. for some heats of rimmed steel, and at intermediate temperatures for semikilled grades. Some semikilled grades had transition temperatures as high as some of the rimmed steel heats.

Charpy impact tests have shown that the notch toughness of weld metal, including the heat affected zone, is equal to or better than that of the base metal.

Tests of large tubular specimens ¾ inch thick under conditions of biaxial stress and −40° F. temperature have produced brittle failures on semikilled ship plate exhibiting as little plastic flow as has been observed on ship failures. The magnitude of stress at which such failures were produced was considerably below that of the uniaxial coupon stress.

Tests of large notched plates ¾ inch thick of ship steel under uniaxial tension load have produced brittle failures with low plastic flow at temperatures as high as 90° F. At temperatures of 32° F. brittle failure was produced in the case of one plate 72 inches wide at 29,000 p. s. i. average stress in the net cross section.

It is believed that the lack of notch toughness at low temperatures, and the loss of strength and ductility under multiaxial stresses of shipbuilding steels is a prime factor in the failure of welded ships. It should be noted that these properties are not recognized in the existing specifications.

Investigations are now in progress to secure additional data on the strengths of different types of ship plate when subjected to multiaxial stresses at various temperatures. These studies include the testing of large tubular specimens under biaxial tension, of notched-plate specimens and of full-scale portions of ship's structure.

3. *Fabrication.*—As mentioned in the introduction, the large part of the investigation covering this subject has thus far dealt with the matter of residual and locked-in stresses where the former are envisaged as being the byproduct of welding unrestrained members, whereas the latter include also stresses resulting from other fabrication and assembly processes.

a. Residual Welding Stresses.—It has been established that a reproducible pattern of high longitudinal tension stress and low transverse stress exists in all butt-welded joints in free ship sub-assemblies. The magnitude of these stresses in such sub-assemblies is not appreciably modified by welding sequence. Residual stresses are not affected by the type of electrode commonly used for ship fabrication nor by the use of austenitic 18–8 electrode.

The above must not be construed to mean that proper welding of erection sequences are not important in preventing cracking and distortion during construction.

It has been determined that with a particular method of block welding procedure in which block welds of not more than 5 inches in length are used, a reduction in the resulting residual welding stress of approximately 50 percent is possible. It should be noted, however, that this method requires that the temperature of the welded block be 125° F. or less before the next succeeding block is deposited. The method appears to have merit for special application, but because of the obvious loss of welding time does not appear suitable for general use in ship welding.

The residual welding stresses may be reduced 50 percent or more in case of simple butt-welded joints in free sub-assemblies, by the application of a controlled low temperature stress-relieving treatment, producing a temperature differential between the weld and base metal. Its effectiveness in geometrically more complex joints or structures has not been so far demonstrated.

Peening the last pass of the welds will also materially reduce the magnitude of residual welding stresses. On the basis of investigations performed, it does not appear that peening other passes than the last will affect reductions of final residual stresses. This statement, however, must not be construed to mean that peening intermediate and root passes is not helpful in preventing weld cracking and in controlling distortion.

It has been found that residual welding stresses can be relieved by the application of external load causing plastic flow of the weld metal and adjacent area. Conditions of external restraint tending to inhibit plastic flow in the weld area will reduce the amount of stress relief taking place. Such conditions apparently exist in varying degrees on board ship because on eight Liberty ships investigated to date the residual stresses in the deck joints abreast of No. 3 hatch were not "worked out" or even reduced significantly after considerable service. A small reduction of residual stress was observed on two tankers subjected to severe hogging and sagging tests, but the magnitude of reduction was very much less than what could be expected in unrestrained welds subjected to the same unit loadings.

Preheating ship steel up to 375° F. does not achieve significant reductions in residual welding stresses.

Tests of large tensile specimens of ship steel up to 30 square inches in cross-sectional area were made in order to compare "as-rolled" plate with longitudinally welded plates both in the "as-welded" and stress-relieved conditions. Those tests showed that the elongations of "as-welded" plates were somewhat less than those obtained in either "as-rolled" plate or welded plate which had been stress-relieved. However, the large amount of plastic flow which preceded failure in the "as-welded" plates does not in any way duplicate the brittle fractures with barely measurable plastic flow which have been characteristic of the ship failures.

Tests of large tubes of both ¼ inch and ¾ inch thick ship plate, in both stress-relieved and "as-welded" conditions, subjected to biaxial tension stresses again indicated ability of plate and welds to undergo large plastic flows irrespective of the presence of residual welding stresses.

In general, it may be concluded that the contribution of the residual welding stresses to the failure of welded steel ships has not yet been fully determined. Preliminary results of all investigations of this subject indicate to date that residual stresses do not contribute to the failure of welded structures except possibly under some special conditions of stress, inhibiting shear flow.

Some indications exist that the effect of metallurgical changes caused by welding process is more important in the properties of welded structures than that of residual welding stresses.

b. Locked-in Stresses.—Considerable research is now in progress investigating the magnitude of the locked-in stresses which are defined as all stresses resulting from fabrication and assembly processes.

Up to the present time no tensile locked-in stresses have been observed in deck plate of approximately 30 ships investigated by three independent agencies and representing ships built in a variety of shipyards and with a number of erection sequences. The locked-in deck plate stresses are of the order of 4,000–8,000 p. s. i. in compression in the fore and aft direction.

Investigation of locked-in stresses is being continued to include effect of unusual climatic conditions.

CONCLUSIONS

On the basis of the data available to date, the following conclusions are drawn:

1. Residual welding stresses do not contribute materially to the failure of welded structures.
2. Locked-in stresses in the deck plating (away from welds) of completed ships are generally compressive and of low magnitude (4,000–8,000 p. s. i.).

3. Residual welding stresses in completed vessels are not appreciably reduced by normal service.

4. Lack of notch toughness at low temperature and loss of strength and ductility under multiaxial stresses, of steels used in ship building is a prime factor in the failure of welded ships.

5. Large tubular specimens of ship steel, with and without welds, tested under biaxial tension and especially at low temperature show great reduction in strength and ductility as compared with results from usual tensile tests at corresponding temperatures. At −40° F. lack of plastic flow was comparable to that found on ship fracture.

6. Large notched specimens of ship plate tested at 32° F. produced brittle failures at half the nominal strength with lack of plastic flow comparable to ship fractures.

7. Very high stress concentrations exist in the hull structure of ships. A strain concentration of seven has actually been measured on a cargo hatch corner, the vessel being at sea.

8. Welding sequence in general has no effect upon the magnitude of residual welding stresses in free subassemblies.

9. Residual welding stresses may be reduced by peening the last pass of manual welds.

10. Residual stresses are not reduced by preheating up to 375° F.

It must be reiterated that the above conclusions are based on data produced to date. Additional data which is expected shortly from the research now under way may necessitate revisions or modifications of some of these conclusions.

Ingenious Method of Weighing Anchor

THE S. S. *Chatham C. Lyon*, John M. Hartzler, master, recently had difficulty with her anchor windlass. In trying to heave up the anchor, the crankshaft pulled out of the bearings, and the pinion gear on the crankshaft jumped clear of the bull gear on the windlass, smashing the containers for bearings on the crankshaft, and also smashing the eccentrics. Temporary repairs were effected, but a sudden heavy strain again damaged the windlass, this time beyond repair by the ship's personnel.

It was then decided to slip the port anchor and bring it aft to the portside No. 2 hatch, and retrieve the anchor and chain by the use of the jumbo boom and gear. Work progressed slowly until all but 1½ shot of the chain was on deck, but the 1-inch wire strap securing the chain to a pair of bollards proved too light for the job and snapped under a sudden strain, and through this error in judgment, anchor and chain were lost.

The master then determined on a different method for retrieving the starboard anchor. He had the damaged crankshaft removed from the windlass, a hole drilled in the niggerhead on each side, and a ¾-inch wire runner secured to each one. About 25 turns of wire were taken on each niggerhead, and the ends secured to the drums of port and starboard No. 1 winches, respectively. The windlass was taken out of gear, and a satisfactory test of the method was made before it was put into actual operation.

By operating both No. 1 winches together, a small strain was put on the wire runners, and the niggerheads were forced to revolve as the wire unwound. The anchor windlass was then put in gear, and the brake taken off the starboard wildcat, and in this manner it was possible to retrieve the 9 shots of chain which were out at the time.

It was necessary to operate the winches very carefully in order to maintain the same strain on both wires, but if any undue strain developed the brakes could be immediately engaged. Due to the short length of the wire runners available, only about 25 turns could be placed on each niggerhead at one time. This was enough to heave in 5 fathoms of chain, after which the brake could be put on, the wildcat taken out of gear, and the wire rewound from the drums of the winches back onto the niggerheads, as these could be easily revolved by hand when disengaged from the wildcat.

From the time of the loss of the port anchor until the starboard anchor was secured in the hawsepipe required less than 1 hour, and Captain Hartzler showed commendable ingenuity in this method of handling the breakdown.

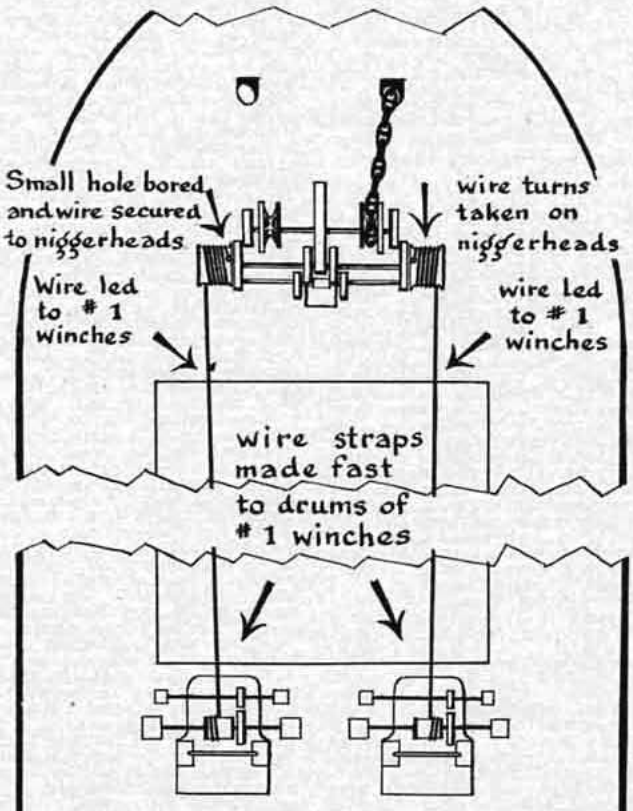


Diagram showing method used to operate disabled windlass by wire straps led to # 1 cargo winches. AM

Aids to Navigation

PROBABLY few mariners making use of the elaborate system of aids to navigation maintained by the United States Government for their benefit, appreciate the fact that this system really is less than 100 years old. For practical purposes, it may be said that effectively systematized aids to navigation did not actually come into being until 1852 as a result of advances sponsored by the United States Lighthouse Board.

Since approximately half of the 24 hours is darkness, it was natural that the first effort towards providing assistance to the mariner should have taken the form of a shore light. Traditionally, such lights were provided centuries ago by the Egyptians and the Greeks. In this country the first navigational light was at Boston Lighthouse, built in 1716. In 1789, when the Federal Government took over the colonial light systems, there was a total of 12 coastal lights of modest intensity and with no distinguishing characteristics.

As early as 1792 Congress recognized the need for some means of distinguishing the light of a lighthouse from other lights. This, however, could not be satisfactorily accomplished until the introduction of the Fresnel lens, recommended by the referred-to Lighthouse Board. This lens permitted not only a more intense light but also the adoption of distinctive characteristics. By making flashes of longer or shorter length and at variable intervals, it is obvious that an almost infinite number of characteristics can be produced. The use of fixed lights, because of possible confusion with other shore lights, was generally abandoned. Primary coastal lights are usually either flashing, or occulting, or group flashing as in the case, for example, of Minot's Ledge light whose flashes 1–4–3 have led it to be called the "I love you" light.

But it was equally obvious that there was no need for a greater number of differing characteristics than would permit distinguishing between lights in the same general vicinity. Anything more than that would be an unnecessary complication. After giving this matter extensive study and tests, the Coast Guard reached the conclusion that a flashing light offered the most readily identifiable and effective signal, subject to two requirements: first, that the flash should endure at least one second in order to permit an accurate bearing to be taken and that the flash sequence should recur in approximately 10 seconds in order to avoid an undue period of eclipse. Ready identification could be given by means of short half- or quarter-second flashes during the eclipse period, there being either one, two, three or four flashes in such period for identification purposes. With such a system any light in any group of four could be readily identifiable and it would be unlikely that under today's conditions any mariner would be so far out of his reckoning as to confuse a light in one group with that of another. This proposal for eventual adoption would, therefore, require only four basic characteristics.

Servicing a large, lighted bell buoy.

With the growth of navigation, it became necessary to establish powerful lights at points where the water was too deep for the construction of a lighthouse. For this purpose, lightships were employed, the first one being established in 1820 off Craney Island, in the Chesapeake. Lightships, of course, can be given the same distinguishing characteristics of lighthouses, since they are attended and have adequate power. They are, however, an expensive type of aid to maintain and every effort is being made to reduce the number required and to cut the cost of those that must be retained.

For illumination, where neither lighthouse nor lightship was practicable nor required, lighted buoys were provided. The first one dates back to 1881, although they did not come into general use until about 1889. A lighted buoy offers a certain problem, since there are finite limits to the amount of illumination it can provide without being serviced. For this reason, lighted buoys, with the exception of certain ones of major importance, show flashing lights. Here again the problem of identification arises, less perhaps to identify the individual buoy than to indicate what it marks. The present characteristic system for our lighted buoys is consistent, uniform, and readily comprehended. An offshore buoy which may be used for taking bearings on has a one- or two-second flash within a 5- to 10-second period. Buoys which merely mark the edge of a channel have a short flash, usually 0.4 of a second at a 4-second period. Buoys marking turns in channels have a continuous series of short, quick flashes and those marking obstructions an interrupted series of quick flashes. Where a fairway buoy is lighted, it flashes a dot dash every 8 or 10 seconds.

A further use of lights for aids to navigation is the establishment of ranges, or sectors of single lights, to mark accurately an axis used for navigational purposes. As there is rarely any need for identification, range lights are usually designed to prevent confusion with other lights in the background, and this is most frequently accomplished by flashing the forward light and, where necessary, the rear light.

As ships deepened and navigation increased and particularly as channels required marking, daylight navigational aids became also of great importance. For this purpose, buoys are chiefly relied upon, although ranges and day marks are also somewhat used. An act of Congress of September 28, 1850, prescribed the standard system of colors to be used in this country, namely red to starboard and black to port, entering harbor. Mid-channel, obstruction, and other buoys are either parti-colored or of other colors than red or black. In 1889, the shape distinction for lateral buoys was adopted, the conical or nun for red buoys and the cylindrical or can for black buoys, with spar buoys of either color. Presently, cans and nuns are further divided by their proportions as tall, standard, special, and river, with three sizes of each type.

In addition to the problems of navigating by night, or in a restricted waterway in the daytime, a third condition faces the mariner, that of fog or low visibility. No visual system is helpful under such conditions. Until recently the only aid which could be given to the navigator in fog was by

means of sound signals. As early as 1719 a fog cannon was located at Boston Lighthouse and discharged at intervals during thick weather. In 1851 a compressed air trumpet was experimented with, the power being furnished by a horse-driven compressor. In 1855 bellbuoys were first established, followed in 1876 by whistling buoys. Both such buoys, of course, are dependent upon the action of the water for sounding their signal and consequently no distinguishing characteristic could be imparted to such equipment.

In 1869 the first steam whistle was added to lighthouse equipment. Today, of course, practically all lighthouses and lightships have their distinctive fog signal with an identifying characteristic. While these signals have differing tones and pitch, the basic identification is supplied by the period of the sound. Here again careful study and test have shown the best results are obtained from a 2- or 3-second blast in a 20- or 30-second interval, the ratio between the sound and the silence being the same 1 to 10 that was found most suitable for lights. Intensification of tone or greater frequency of the signal becomes seriously annoying to residents in the vicinity of such signals.

In 1921, scientific developments permitted the establishment of the radio beacon system. This system made it possible for vessels equipped with a simple direction finder to take bearings on shore stations under any conditions of weather or visibility. This was undoubtedly the greatest advance in facilitating navigation within 200 miles of shore since man first followed the sea. The radiobeacon in thick weather sends out a code letter on an assigned frequency which is repeated for one minute in each three. Usually two other adjacent stations on the same frequency transmit their respective distinctive calls for one minute in each of the other two minutes. On a single frequency, therefore, the mariner usually should be able to secure three lines of bearing which would give him a dependable fix. During clear weather each group of stations usually operates 10 minutes out of each half hour. At present, there are 190 radiobeacons operated in the United States graded into 4 classes; 200-mile range, 100-mile range, 20-mile range, and marker radiobeacons for close navigation. This latter grade is not attended and is not synchronized into any system of other markers.

Report of Lifesaving Equipment Committee

THE Committee on Lifesaving Equipment, one of the committees studying the proposed revision of the International Convention of 1929, has completed its studies and submitted its draft proposals. These proposals were based upon certain general principles arrived at by the committee from a careful study of the casualty records.

Basically, the committee found that, under present conditions and with modern vessels, it was rare that casualties requiring the abandonment of the vessel took place where rescue was not available within a short time. From this, the committee drew the conclusions that lifeboat equipment should be simplified and the boat considered as a means of maintaining its complement in reasonable security pending rescue, rather than as a means of transporting that complement over long distances to shore.

The recommendations of the committee stress the importance of adequate and efficient arrangements for lowering all boats, including the provision of a set of davits for each boat, and the development of the boat itself to the exclusion of other flotation equipment, such as rafts and buoyant apparatus. The provision of special rescue boats on large vessels, for rendering assistance to other craft, is proposed, and wider use of light, portable lifeboat radios is advocated.

The committee was composed of: Commodore Norman B. Hall, U. S. C. G., chairman; Commander George W. Nelson, U. S. C. G., vice chairman; Mr. R. J. Baker, Mr. A. G. Bates, Capt. Logan Cresap, Capt. Jeremiah Delany, U. S. A. T. C., Mr. V. C. Farrell, Maj. Paul D. Fenwick, U. S. A. T. C., Capt. George Fried, U. S. C. G. R., Mr. John S. Gambs, Mr. Louis C. Guidry, Mr. H. T. Gunderud, U. S. A. T. C., Mr. W. B. Jupp, Mr. Philip E. King, U. S. A. T. C., Mr. Max D. Kossoris, Mr. E. E. Martinsky, Mr. R. M. Meyer, Mr. A. Osborne, Capt. R. E. Pendleton, Capt. C. O. Rydholm, Col. L. C. Sabin, Capt. M. P. Schermerhorn, Capt. A. Sledge, U. S. N., Mr. Laurence R. Thompson and Mr. V. A. Wallace.

Hearing Units

COAST GUARD Merchant Marine Hearing Units and Details investigated a total of 3,744 cases during the month of September 1945. From this number hearings resulted involving 125 officers and 796 unlicensed men. In the case of officers, 6 licenses were ordered revoked, 42 were suspended, 55 were suspended on probation, 23 were voluntarily surrendered, 2 were closed with admonitions, and 23 cases were dismissed. Of the unlicensed personnel, 36 certificates were revoked, 274 were suspended, 385 were suspended on probation, 245 were voluntarily surrendered, 10 were closed with admonitions, and 64 cases were dismissed after hearing.

LESSONS FROM CASUALTIES

Mines in the Mediterranean

The Coast Guard is in receipt of advices showing that an alarming number of American Merchant vessels have recently struck mines in the Mediterranean area, particularly off the west coast of Italy. In addition to the vessels that have actually struck mines there have been a number who have steamed through known mine fields but have miraculously escaped. In some cases radar stations have picked them up in time to warn them away from danger.

The majority of the casualties have been caused by poor navigation and failure to adhere to routing instructions. Many have been due to inadequate routing instructions and to diversion enroute. In addition, severe weather has undoubtedly caused a large number of mines to break adrift and become surface menaces.

It is understood that the War Shipping Administration and the British routing authorities are making strenuous efforts to impress upon masters the importance of accurately following routing instructions, and that the British are preparing a special series of chartlets covering the region. It will be some time, however, before these latter will be available, and in the meantime masters should exercise all possible vigilance and care in their navigation. In the Leghorn-Genoa-Savona region and in the Ancona-Trieste region local pilots are said to be available.

The fact that almost all of the Mediterranean casualties have occurred to American vessels may be due in part to a preponderance of our flag in those waters, but it would seem also at-

tributable to an unwillingness of American masters, many of whom are new to the area, to be guided by such information as is available to them. The danger of mines in the Mediterranean is likely to be present for some time, and it cannot safely be disregarded.

Death Lurks in the Bilges

Once more the Coast Guard has occasion to call attention to the dangers which lurk in unventilated spaces, particularly where gasoline or other volatile liquids are present in considerable quantities.

Recently an American tankship was discharging 80-octane gasoline in a foreign port. The vessel previously had had considerable trouble with her cargo pumps which were of the steam-driven reciprocating type. Some repairs had been effected during the voyage previous to the incident referred to in this article but the pumps continued to give trouble.

A motor-driven blower in good working condition was installed in the pumproom but for some unknown reason had been stopped just previous to the accident. During the discharging of the cargo considerable difficulty was experienced in keeping the cargo pumps in operation. They had stopped a good many times, leaks were experienced past the rods and through the packing glands of various valve stems. These leaks aggregated a considerable amount of gasoline which finally amounted to several feet in the bilges of the pumproom. The pumpman on duty was not regularly signed on as such and presumably was not as familiar with this type of duty as he might have been. At any rate he apparently did not realize the seriousness of this condition and, with the blower maintaining the atmosphere fairly clear, continued to endeavor to pump out the cargo until the above-mentioned unexplained stoppage of the blower took place. Apparently warned by the thickening fumes, the acting pumpman started up from the pumproom but collapsed on the second grating. He was seen by another crew member who was looking down into the pumproom from the top grating. The latter man ran out on deck where he met the boatswain. These two then hurried back into the pumproom in an endeavor to rescue the fallen pumpman, only to collapse in turn themselves.

At about this time another crew member made the very common mistake of attempting to use an "ordinary gas mask" designed for protection against certain poisonous gases.

Risk from mines still exists in certain waters.

Needless to say the gas mask was useless, as this type of mask is only usable when sufficient oxygen for breathing is present. Two of the ship's officers then endeavored to rescue the stricken men from the pumproom without the aid of a mask. They were both forced to retreat to the deck without having accomplished their purpose. Indeed, they were lucky that they did not collapse themselves. Finally a fresh air mask was obtained and after one unsuccessful attempt due to the fouling of the air and life lines the unconscious men were removed from the pumproom. First aid was rendered but two of the men were dead upon arrival at the hospital and the third man remains in a serious condition.

This tragedy illustrates several points which the Coast Guard is endeavoring constantly to drive home to the seafaring fraternity in its efforts to promote safe practices at sea:

1. The pumproom machinery should never have been operated when it was in such condition that copious leaks of gasoline took place.

2. Nobody should have been allowed to operate the pumproom machinery who was not sufficiently familiar with the dangers surrounding the accumulation of raw gasoline in the bilges to realize that the latter needed to be cleaned before any further pumping took place.

3. After the presence of gasoline in the bilges had been realized no chances should have been taken on the continuous operation of the blower.

4. Everyone should have been familiar with the fact that the ordinary gas mask designed for protection against toxic gases is of no use whatever in at atmosphere deficient in oxygen.

5. As a corollary to the above the officers and crew should have known that when a deficiency of oxygen exists, either a fresh air hose mask or an oxygen breathing apparatus should have been used in order to safely enter the pumproom and remove the collapsed pumpman.

In conclusion, therefore, whenever a situation like the foregoing arises do not lose your head and go dashing into a tank or pumproom where a deficiency of oxygen is suspected with the idea of rescuing someone only to collapse yourself and make more work for those who come after you. Unless the proper protective apparatus is available that is exactly what you will do as shown by this case and many others in the Coast Guard's files. Hard as it seems, you must wait until the fresh-air hose mask arrives or until the atmosphere has been cleared before attempting rescue work.

In the foregoing case none of the deaths was necessary. If the pumpman had realized the dangers of allowing gasoline to accumulate in the bilges, he would not have been overcome and if the first two would-be rescuers had used their heads as well as their hearts, they would have secured the proper rescue apparatus before entering the pumproom and thus neither of them need have died.

APPENDIX

Amendments to Regulations

TITLE 33—NAVIGATION AND NAVIGABLE WATERS

Chapter I—Coast Guard, Department of the Navy

PART 10—AIR RAID AND BLACKOUT REGULATIONS FOR VESSELS, HARBORS, PORTS, AND WATER-FRONT FACILITIES

WESTERN DEFENSE COMMAND, WASHINGTON, OREGON, AND CALIFORNIA

Pursuant to Executive Order 9074 (7 F. R. 1587) and in accordance with the provisions of the act of July 9, 1943, 57 Stat. 391, the Air Raid and Black-out Regulations for Vessels, Harbors, Ports, and Water-front Facilities are amended, as follows, effective upon publication in the Federal Register:

Sections 10.21 to 10.32, inclusive, are hereby rescinded (10 F. R. 14148, 16 November 1945).

TITLE 46—SHIPPING

Chapter I—Coast Guard: Inspection and Navigation

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

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

LICENSED OPERATORS

Section 25.8–3 is amended to read as follows:

§ 25.8–3 *Professional qualifications and examination.* (*a*) An applicant for a license as an operator shall submit a sworn application on the prescribed form to the Officer in Charge, Marine Inspection. The applicant shall be examined orally concerning his character and fitness to hold such license and a thorough inquiry shall be made into the proofs submitted concerning his character and ability. If, after the oral examination and investigation, the Office in Charge, Marine Inspection, considers the applicant's capacity, knowledge, experience, character, and habits of life to be such as to warrant entrusting him with the duties and responsibilities involved in the operation and navigation of motorboats carrying passengers for hire, a license authorizing him to discharge such duties on any such motorboats for a term of five years shall be issued to him; except that when the applicant is the holder of a currently valid license as master, pilot, or other deck officer, a motorboat operator's license may be granted without requiring a physical or professional examination if recent service under his license can be shown, and such applicant shall not be required to surrender his license as master, pilot, or other deck officer.

(*b*) The examination will consist of questions on the regulations governing motorboats, the collision regulations applicable to the waters over which the applicant operates, fire protection and extinguishment, lifesaving equipment, the operation of propelling machinery, and, particularly, the safe and proper handling of gasoline motors, the proper method of operating and navigating motorboats carrying passengers, and simple first-aid. Although applicants will be examined only in the collision regulations applicable to the waters upon which they are operating, it will be incumbent upon them, should they at any time operate on waters for which the collision regulations differ, to familiarize themselves with the appropriate rules.

PART 28—SPECIFICATIONS AND PROCEDURE FOR APPROVAL OF EQUIPMENT

LIFESAVING EQUIPMENT

Section 28.4–8 (*g*) is amended by the addition of the following sentence at the end thereof:

§ 28.4–8 *Specifications for kapok buoyant cushion.* * * *

(*g*) *Marking.* * * * Tags of the flag or pennant type are not permitted.

Subchapter D—Tank Vessels

PART 36—LICENSED OFFICERS AND CERTIFICATED MEN

LICENSED OFFICERS

Section 36.1–12 is amended to read as follows:

§ 36.1–12 *Signing and thumbprinting licenses—T/ALL.* Every person to whom a license or certificate of lost license is issued shall place his signature and left thumbprint thereon, and upon any blank sheets attached for additional endorsements.

Section 36.2–1 *Able seamen—TB/OCLB* is amended by striking out the words "and shall be green in color", the words "and shall be blue in color", the words "and be blue in color", the word "(blue)", and the word "(green)", wherever they appear.

Paragraph (d) of § 36.2–3 *Certificated tankerman—TB/ALL* is amended by striking out the second sentence and inserting in lieu thereof the following sentence: "Every certificate as Tankerman issued after November 1, 1945, shall be in the form of a merchant mariner's document, Form 2838, endorsed with the rating of Tankerman and the kinds or grades of liquid cargo the holder is qualified to handle. A merchant mariner's document endorsed as Tankerman shall be a certificate as Tankerman." (10 F.R. 13314, 26 October 1945.)

Subchapter F—Marine Engineering

PART 55—PIPING SYSTEMS

Section 55.19–8 is amended by deleting Figures P–1 to P–10, inclusive, with descriptions, and inserting new Figures P–1 to P–16, inclusive, with descriptions, in their place and by changing paragraph (*e*) to read as follows:

§ 55.19–8 *Flange standards.* * * *

(*e*) *Methods of attachments.* Flanges shall be attached to the pipe by any method shown by Figures P–1 to P–16, inclusive, or by any additional means that may be approved by the Commandant.

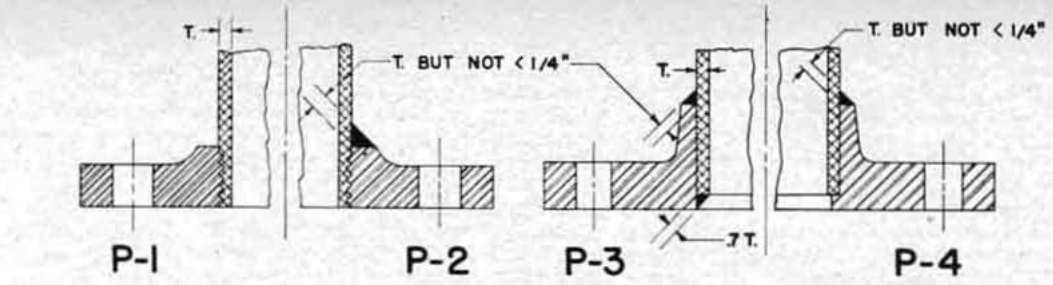
Figure P–1.—Flanges with screwed threads may be used for Class I piping not exceeding 2 inches nominal pipe size. For Class II piping, flanges with screwed threads may be used without diameter limitation.

Figure P–2.—Low hub flanges with screwed threads plus the addition of a strength fillet weld of the size as shown may be used for Class I piping for pressures not to exceed 300 pounds per square inch and for temperatures not exceeding 750° F.

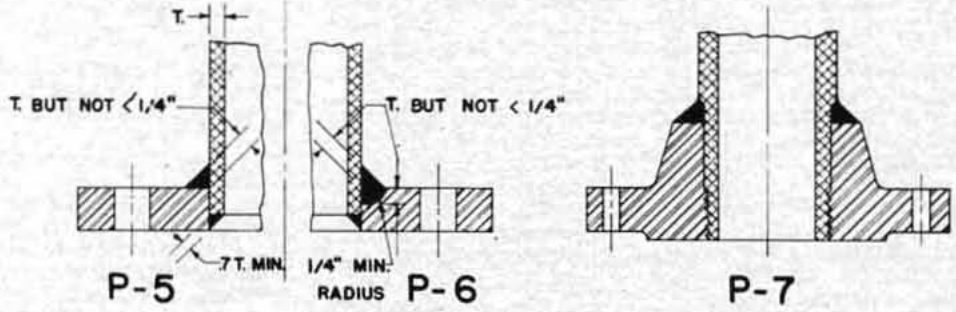
Figure P–3.—Slip-on flanges may be used for Class I piping for nominal pipe size not exceeding 2½ inches and for Class II piping without diameter limitation. The face of the flange shall extend beyond the end of the pipe at least equal to the thickness of the pipe wall and the flange shall be attached as shown by Figure P–3.

Figure P–4. — Socket welding flanges may be used for Class I piping of nominal pipe size not exceeding 2½ inches. For Class II piping, socket welding flanges may be used without diameter limitation.

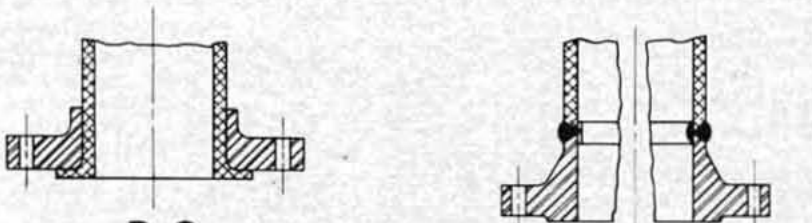
Figure P–5.—Flanges machined from steel plate may be used for Class



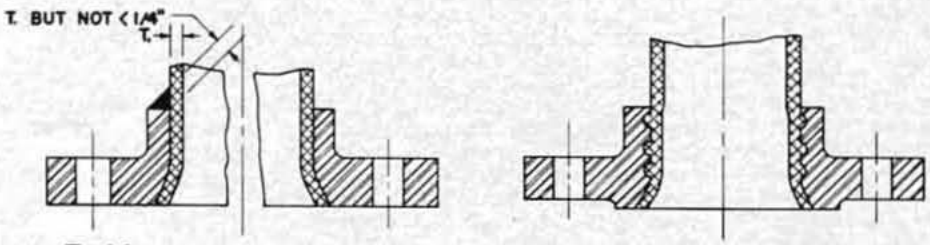
P-1 P-2 P-3 P-4



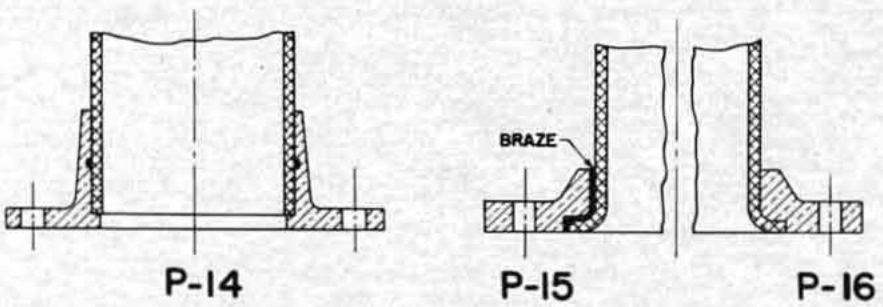
P-5 P-6 P-7



P-8 P-9 P-10



P-11 P-12 P-13



P-14 P-15 P-16

ACCEPTABLE TYPES OF FLANGE ATTACHMENTS

II piping for pressures not exceeding 125 pounds per square inch provided the steel plate meets the requirements of §§ 51.21–1 to 51.21–13, inclusive. The machined flanges shall comply with Table P–3. The face of the flanges shall extend beyond the end of the pipe at least equal to the thickness of the pipe wall and shall be attached as shown by Figure P–5.

Figure P–6.—Steel plate flanges meeting the requirements listed for Figure P–5 may be used for Class II piping for pressures exceeding 125 pounds per square inch provided the flange is attached to the pipe as shown by Figure P–6.

Figure P–7.—Pipe may be attached to high hub flanges where the end of the pipe and the bore of the flange are machined to a snug fit and the hub welded to the pipe as shown by Figure P–7.

Figure P–8.—Lap joint flanges (Van Stone) may be used for Class I and Class II piping. The Van Stone equipment shall be operated by qualified personnel and the ends of the pipe shall be heated from 1,650° to 1,900° F., dependent upon the size of the pipe prior to the flanging operation. The foregoing temperatures shall be carefully adhered to in order to prevent excess scaling of the pipe. The extra thickness of metal built-up in the end of the pipe during the forming operation shall be machined to restore the pipe to its original diameter. The machined surface shall be free from surface defects and the back of the Van Stone lap shall be machined to a fine tool finish to furnish a line contact with the mating surface on the flange for the full circumstances as close as possible to the fillet of the flange. The number of heats to be used in forming a flange shall be determined by the size of the pipe and not more than two push-ups per heat are permitted. The width of the lap flange shall be at least three times the thickness of the pipe wall and the end of the pipe shall be properly stress relieved after the flanging operation is completed. Manufacturers desiring to employ this type of joint shall demonstrate to an inspector that they have the proper equipment and personnel to produce acceptable lap joints.

Figure P–9.—Welding neck flanges may be used on any piping provided the flanges are butt welded to the pipe. The joint shall be welded as indicated by Figure P–9 and a backing ring employed which will permit complete penetration of the weld metal.

Figure P–10.—Welding neck flanges may also be attached to pipe by double-butt welds as shown by Figure P–10.

Figure P–11.—Flanges may be attached by shrinking the flange on to the end of the pipe and flaring the end of the pipe to an angle of not less than 20°. A fillet weld of the size shown by Figure P–11 shall be used to attach the hub to the pipe. This type of flange is limited to a maximum pressure of 250 pounds per square inch at temperatures not exceeding 500° F.

Figure P–12.—The flange of the type described and illustrated by Figure P–11 may be used for Class II piping with fillet weld omitted.

Figure P–13.—Flanges may be attached by expanding the pipe into the grooves machined in the hub of the flange and flaring the end of the pipe to an angle of not less than 20°. This type of flange is limited to a maximum pressure of 250 pounds per square inch at a temperature not exceeding 500° F. For Class II piping, it is not required that the ends of the pipe be flared.

Figure P–14.—Bronze alloy flanges may be used for temperatures not exceeding 406° F. The hub of the flange shall be bored to a depth of not less than that required for a threaded connection the same diameter leaving a shoulder for the pipe to butt against. An annular groove of depth of not less than that required for a pipe thread of the same diameter shall be machined inside the hub of the flange. A preinserted ring of silver brazing alloy having a melting point of not less than 1,000° F. and of sufficient quantity to fill the annular clearance between the flange and the pipe shall be inserted in the groove. The pipe shall then be inserted in the flange and sufficient heat applied externally to melt the brazing alloy until it completely fills the clearance between the hub of the flange and the pipe. A suitable flux shall be applied to the surfaces to be joined to insure an acceptable joint.

Figure P–15.—Flanges may be attached to non-ferrous pipe by inserting the pipe in the flange and flanging the end of the pipe into the recess machined in the face of the flange to receive same. The width of the flange shall be not less than three times the pipe wall thickness. In addition thereto, the pipe shall be securely brazed to the wall of the flange. This flange is limited to a maximum temperature of 406° F.

Figure P–16.—The flange of the type described and illustrated by Figure P–15 may be used for Class II piping with the brazing omitted.

Section 55.19–11 (*d*) is amended by changing subparagraphs (1) and (3) to read as follows:

§ 55.19–11 *Class II piping.* * * *

(*d*) *Flanges.* * * *

(1) Flanges shall be made of forged steel, cast steel, steel plate, wrought iron, bronze and malleable or cast iron or such other equivalent material as may be approved by the Commandant.

* * * * *

(3) Flanges may be attached by any method specified by Figures P–1 to P–16, inclusive, or by any additional means that may be approved by the Commandant.

Subchapter G—Ocean and Coastwise: General Rules and Regulations

Part 61—Fire Apparatus; Fire Prevention

Section 61.4 (*c*) (4) is amended by the addition of the following sentence at the end thereof:

§ 61.4 *Steam and inert-gas fire-extinguishing systems.* * * *

(*c*) *Steam systems on mechanically propelled vessels contracted for on or after July 1, 1935.* * * *

(4) * * * In lamp lockers, oil rooms, and like compartments, adequate means may be provided for ventilation if suitable dampers capable of being operated from outside the spaces are fitted in each vent duct.

Section 61.25 is amended by changing paragraphs (*e*) (1) and (*f*) to read as follows:

§ 61.25 *Butane and propane gases for heating and cooking.* * * *

(*e*) *Piping and fittings.* (1) the piping between the cylinders and appliances shall be seamless annealed copper tubing, type K, complying with Federal Specification WW–T–799a. The tubing connections shall be flared and the number held to a minimum.

* * * * *

(*f*) *Tests.* Each joint of the piping between the cylinders and appliance shall have a soap solution applied and be tested with compressed air after installation and at each annual inspection. The test pressure shall be not less than twice the pressure at which the relief valve is set but in no case shall it be less than 50 pounds per square inch.

Part 62—Licensed Officers and Certificated Men

INSPECTED VESSELS

Section 62.6 is amended to read as follows:

§ 62.6 *Signing and thumbprinting licenses.* Every person to whom a license or certificate of lost license is issued shall place his signature and left thumbprint thereon, and upon any blank sheets attached for additional endorsements.

Section 62.63 *Examination of able seamen* is amended by striking out the words "and shall be green in color", the words "and shall be blue in color", the words "and be blue in color", the word "(blue)", and the word "(green)" wherever they appear. (10 F.R. 13314, 26 October 1945).

LICENSED MASTERS, MATES AND ENGINEERS

Section 62.114 is amended to read as follows:

§ 62.114 *Signing and thumbprinting licenses.* (a) Every person to whom a license or certificate of lost license is issued shall place his signature and left thumbprint thereon, and upon any blank sheets attached for additional endorsements.

(b) Every master, mate, or engineer who receives a license shall make oath before an Officer in Charge, Marine Inspection, to be recorded upon his official file, that he will faithfully and honestly, according to his best skill and judgment, without concealment or reservation, perform all the duties required of him by law and obey all lawful orders of his superior officers.

Subchapter H—Great Lakes: General Rules and Regulations

PART 77—FIRE APPARATUS; FIRE PREVENTION

Section 77.4 (c) (4) is amended by the addition of the following sentence at the end thereof:

§ 77.4 *Steam and inert-gas fire-extinguishing systems.* (See § 61.4 of this chapter, as amended, which is identical with this section.)

Section 77.24 is amended by changing paragraphs (e) (1) and (f) to read as follows:

§ 77.24 *Butane and propane gases for heating and cooking.* (See § 61.25 of this chapter, as amended, which is identical with this section.)

Part 78—Licensed Officers and Certificated Men

INSPECTED VESSELS

Section 78.6 is amended to read as follows:

§ 78.6 *Signing and thumbprinting licenses.* (See § 62.6 of this chapter, as amended, which is identical with this section.)

Section 78.54b *Examination of able seamen* is amended by striking out the words "and shall be green in color", the words "and shall be blue in color", the words "and be blue in color", the word "(blue)", and the word "(green)", wherever they appear (10 F.R. 13314, 26 October 1945).

Part 80—Ferryboats

Part 80 is amended by the addition of a new section 80.7 to follow immediately after section 80.6, reading as follows:

§ 80.7 *Automobiles or other motor vehicles carried on ferryboats.* (a) Automobiles or other motor vehicles shall be stowed in such a manner as to permit both passengers and operators to get out and away from them freely in the event of fire or other disaster. Where there is insufficient clearance to provide for easy egress or ingress at all times, both passengers and operators shall be directed to leave their vehicles and to occupy other spaces reserved for them during the crossing. The decks, where necessary, shall be definitely marked with painted lines to indicate the vehicle runways and the aisle spaces.

(b) The master shall take all necessary precautions to see that automobiles or other motor vehicles have their motors turned off when the ferryboat is under way and the motors shall not be started until the ferryboat is secured to the ferry landing.

(c) The master shall have appropriate "no smoking" signs posted and shall take all necessary precautions to prevent smoking or carrying of lighted or smoldering cigars, cigarettes, etc., in deck areas assigned to automobiles or other motor vehicles.

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

PART 95—FIRE APPARATUS; FIRE PREVENTION

Section 95.4 (c) (4) is amended by the addition of the following sentence at the end thereof:

§ 95.4 *Steam and inert-gas fire-extinguishing systems.* (See § 61.4 of this chapter, as amended, which is identical with this section.)

Section 95.24 is amended by changing paragraphs (e) (1) and (f) to read as follows:

§ 95.24 *Butane and propane gases for heating and cooking.* (See § 61.25 of this chapter, as amended, which is identical with this section.)

PART 96—LICENSED OFFICERS AND CERTIFICATED MEN

Section 96.6 is amended to read as follows:

§ 96.6 *Signing and thumbprinting licenses.* (See § 62.6 of this chapter, as amended which is identical with this section.)

Section 96.55 *Examination of able seamen* is amended by striking out the words "and shall be green in color", the words "and shall be blue in color", the words "and be blue in color," the word "(blue)", and the word "(green)", wherever they appear (10 F.R. 13314, 26 October 1945).

PART 98—FERRYBOATS

Part 98 is amended by the addition of a new section 98.7 to follow immediately after section 98.6, reading as follows:

§ 98.7 *Automobiles or other motor vehicles carried on ferryboats.* (See § 80.7 of this chapter, which is identical with this section.)

Subchapter J—Rivers: General Rules and Regulations

PART 114—FIRE APPARATUS; FIRE PREVENTION

Section 114.6 (c) (4) is amended by the addition of the following sentence at the end thereof:

§ 114.6 *Steam and inert-gas fire-extinguishing systems.* (See § 61.4 of this chapter, as amended, which is identical with this section.)

Section 114.25 is amended by changing paragraphs (e) (1) and (f) to read as follows:

§ 114.25 *Butane and propane gases for heating and cooking.* (See § 61.25 of this chapter, as amended, which is identical with this section.)

PART 115—LICENSED OFFICERS

Section 115.6 is amended to read as follows:

§ 115.6 *Signing and thumbprinting licenses.* (See § 62.6 of this chapter, as amended, which is identical with this section.)

PART 117—FERRYBOATS

Part 117 is amended by the addition of a new section 117.7 to follow immediately after section 117.6, reading as follows:

§ 117.7 *Automobiles or other motor vehicles carried on ferryboats.* (See § 80.7 of this chapter, which is identical with this section.)

Subchapter K—Seamen

PART 136—"A" MARINE INVESTIGATION BOARD RULES

TEMPORARY WARTIME RULES GOVERNING INVESTIGATIONS OF ACCIDENTS AND CASUALTIES

Section 136.108 (c) is amended to read as follows:

§ 136.108 *Witnesses and witness fees.* * * *

(c) Witnesses, other than government employees, summoned to attend any investigation or other proceeding conducted hereunder shall upon application be paid:

(1) A fee of $2.00 for each day or fraction thereof.

(2) A subsistence allowance of $3.00 for each day or fraction thereof if the witness resides at a distance so far removed from place of hearing as to prohibit his returning home each day: *Provided*, That his services are required for more than one day.

(3) Five cents per mile is allowed for going from place of residence or place where the subpoena was served to place of hearing and five cents per mile for returning thereto, which travel must be via the shortest route.

(4) Witnesses whose depositions are taken and persons who take depo-

sitions shall upon application be paid the same fees as are paid for like services in the District Courts of the United States.

PART 138—RULES AND REGULATIONS FOR ISSUANCE OF CERTIFICATES AND CONTINUOUS DISCHARGE BOOKS

Paragraphs (a), (d), and (e) of § 138.1 are amended to read as follows:

§ 138.1 *General provisions.* (a) An applicant for a certificate of service, certificate of efficiency, certificate of identification, or continuous discharge book, shall make written application, in duplicate, on Form 719-b, furnished by the Coast Guard. The placing of fingerprints on the application shall be optional with the seaman. This application may be for as many certificates or ratings as the seaman believes he is qualified. In the case of a seaman applying for his first certificate, other than certificate of identification, the application shall include a request for either a continuous discharge book or a certificate of identification, at the option of the applicant. Every certificate of service, certificate of efficiency, and certificate of identification issued or reissued after November 1, 1945, shall be in the form of a merchant mariner's document, Form 2838. A merchant mariner's document shall be a certificate of service authorizing the holder to serve in any rating endorsed thereon or in any lower rating in the same department or in any rating covered by a general endorsement thereon. A merchant mariner's document endorsed as Able Seaman or as Lifeboatman shall be a certificate of efficiency as Lifeboatman. Every merchant mariner's document shall be a certificate of identification unless the holder also holds a continuous discharge book. The holder of a certificate of identification in the form issued before November 1, 1945, shall surrender that certificate before he is issued a merchant mariner's document.

* * * * *

(d) When the application is submitted for a certificate of identification, certificate of service, certificate of efficiency, or any combination thereof, or a continuous discharge book, the seaman shall furnish three unmounted dull finish photographs of passport type (2 inches by 1½ inches) taken within one year and showing the full face at least one inch in height with head uncovered.

(e) When the application requests a continuous discharge book in addition to a certificate of service or certificate of efficiency one additional photograph shall be furnished.

Section 138.3 *Able seaman* is amended by striking out the words "and shall be green in color", the words "and shall be blue in color", the words "and be blue in color", the word "(blue)", and the word "(green)", whenever they appear.

Paragraph (e) of § 138.5 *Qualified member of the engine department* is amended by striking out the words ", upon qualifying therefor, have endorsement made on the back of his certificate covering such certification", and inserting in lieu thereof the words "qualify therefor", and by striking out the words "for such indorsement" in the second sentence.

Paragraphs (a) and (c) of § 138.6 are amended to read as follows:

§ 138.6 *Certificates of service for ratings other than able seaman or qualified member of the engine department.* (a) Certificates of service shall be issued to applicants for ratings other than able seamen or qualified member of the engine department and the holders thereof may serve in the capacities authorized by appropriate endorsement thereon.

* * * * *

(c) No examination will be required for such certificates of service, but none shall be endorsed to authorize the handling of food unless the applicant produces a certificate from a physician of the United States Public Health Service, or reputable physician acceptable to the Coast Guard, stating that he is free from communicable disease.

Section 138.6 is further amended by striking out paragraph (f) and designating paragraph (g) as paragraph (f) (10 F.R. 13314–13315, 26 October 1945).

Section 138.6 is amended by the addition of a new subparagraph (h) reading as follows:

§ 136.6 *Certificates of service for ratings other than able seamen or qualified member of the engine department.* * * *

(h) An applicant for a certificate of service in an entry rating or for an indorsement covering another such rating shall produce satisfactory proof that he has a commitment of employment as a member of the crew of a United States merchant vessel in a capacity covered by the certificate or indorsement applied for (10 F.R. 13757, 8 November 1945).

Paragraph (d) of § 138.7 *Tankerman* is amended by striking out the second sentence and inserting in lieu thereof the following sentence: "Every certificate as Tankerman issued after November 1, 1945, shall be in the form of a merchant mariner's document, Form 2838, endorsed with the rating of Tankerman and the kinds or grades of liquid cargo the holder is qualified to handle. A merchant mariner's document endorsed as Tankerman shall be a certificate as Tankerman."

Paragraph (b) of § 138.8 *Rules for preparation and issuance of certificates of service and efficiency* is amended by striking out the words "of each" before "certificate".

Section 138.11 *Duplicates; procedure for obtaining* is amended by substituting the word "reissue" for the word "duplicate" and the word "reissues" for the word "duplicates" wherever they appear (10 F.R. 13314–13315, 26 October 1945).

PART 141—MANNING OF INSPECTED VESSELS

Section 141.1 is amended to read as follows:

§ 141.1 *Changes in certificates of inspection.* All applications for changes in certificates of inspection relative to crew requirements shall be made to the Officer in Charge, Marine Inspection, at the port where the vessel actually is at the time the request is made.

Part 141 is amended by the addition of a new section 141.2 following immediately after section 141.1, reading as follows:

§ 141.2 *Right of appeal.* Whenever any person directly interested in or affected by any decision or action of any Officer in Charge, Marine Inspection, shall feel aggrieved by such decision or action with respect to manning requirements, he may appeal therefrom to the District Coast Guard Officer having jurisdiction, and a like appeal shall be allowed from any decision or action of the District Coast Guard Officer to the Commandant, whose action shall be final: *Provided, however,* That such appeals shall be made in writing within 30 days after the decision or action appealed from shall have been rendered or taken: *And provided, further,* That pending the determination of the appeal the crew originally specified must be carried.

Equipment Approved by the Commandant

SAFETY VALVE

Consolidated type 1411 iron body safety valve (maximum pressure of 30 pounds per square inch and maximum temperature of 400° F), submitted by Consolidated Safety Valve Division of the Manning, Maxwell & Moore, Inc., Bridgeport, Conn.

TELEPHONE SYSTEMS

Sound powered telephone systems; Type A, model W. T. P.–1 watertight pedestal mounting station with 6-inch, 8-inch, or 10-inch bell (Dwg. No. 12, Alt. 2); model K, splash-proof bulkhead mounting station with 3-inch, 4-inch, 6-inch, 8-inch, or 10-inch, or cow bell (Dwg. No. 9, Alt. 2), submitted by Hose-McCann Telephone Co., Inc., 177 Pacific Street, Brooklyn 2, N. Y. (10 F. R. 13486, 31 October 1945).

ITEMS SUITABLE FOR MERCHANT MARINE USE

ACCEPTABLE FUSIBLE PLUGS

The Marine Engineering Regulations require that fusible plug manufacturers who desire to have their products approved for marine service shall submit samples for testing from each heat to the Commandant. If the sample fusible plugs pass the test satisfactorily, the manufacturer is notified and then the plugs may be used on vessels subject to inspection by the Coast Guard. If the sample fusible plugs submitted do not pass the test, a fee of $20 for each sample submitted is required and must be paid to the National Bureau of Standards, Washington, D. C. For the information of all parties concerned, a list of approved heats which have been tested and found acceptable during the period from October 16, 1945, to November 15, 1945, is as follows:

The Lunkenheimer Co., P. O. Box 360, Annex Station, Cincinnati 14, Ohio, heat Nos. 217 through 227, inclusive, and 237.

AFFIDAVITS

It is required by the Marine Engineering Regulations that manufacturers submit affidavits before they manufacture items of equipment in accordance with these regulations for use on vessels subject to inspection by the Coast Guard. These affidavits are kept on file at Coast Guard Headquarters and a list of approved manufacturers is published for the information of all parties concerned. The affidavits received and accepted during the period from October 16, 1945, to November 15, 1945, are as follows:

Manning, Maxwell and Moore, Inc., Consolidated Safety Valve Division, Bridgeport 2, Conn., safety valve.

ELECTRICAL APPLIANCES

The following list supplements that published by the United States Coast Guard under date of 15 May 1943, entitled "Miscellaneous Electrical Equipment Satisfactory for Use of 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 (EMM), U. S. Coast Guard, Washington 25, D. C., duplicate copies of a detail assembly drawing, including a material list with finishes of each corrosive part, of each item. An examination of the drawings submitted will be made and, if necessary, tests conducted on such appliances to determine their suitability for marine use.

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	Pumps rooms of tank vessels	
Benjamin Electric Manufacturing Co., Des Plaines, Ill.:					
Gangway lighting fixture, portable, with guard, globe and reflector, 100 watts maximum, drawing No. 29773, issue 3	x	x	x	.....	11-14-45
Magazine lighting fixture (U. S. Navy drawing No. 9-S-4536-L, type J-S) 50 watts maximum, drawing No. 90080, issue 4	x	x	x	x	11-14-45
Henschel Corp., Amesbury, Mass.:					
Internal units for electric telegraph equipment, drawing No. 10-1041, sheets 1 and 2, alteration 4	.....	.....	.....	.....	10-18-45
The Ncreo Co., Los Angeles, Calif.:					
Cable clamping devices, drawings Nos. N. J. C. 103, alteration 0, and 104, alteration 0	.....	.....	.....	.....	11- 9-45
Oceanic Electric Products Corp., New York, N. Y.:					
Switch and pilot light, waterproof, single pole, 10 amperes, 125 volts, catalog No. 3830, drawing No. 2566, alteration 2	x	x	x	.....	10-18-45

Merchant Marine Personnel Statistics

MERCHANT MARINE LICENSES ISSUED DURING OCTOBER 1945

DECK OFFICERS

Region	Master										Chief mate										Second mate									
	Ocean		Coastwise		Great Lakes		B. S. & L.		Rivers		Ocean		Coastwise		Great Lakes		B. S. & L.		Rivers		Ocean		Coastwise		Great Lakes		B. S. & L.		Rivers	
	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R
Atlantic coast	35	58	7	5			6	29	1	2	101	11		2			1	6			181	12		2						
Gulf coast	5	13		2			1	3	1	10	9	4		1				1	1		26	4								
Great Lakes and rivers		2			3	6			2	13		1		1					3	7										
Pacific coast	33	41	4	3			6	11			64	7					5	3	1		152	5								
Total	73	114	11	10	3	6	13	43	4	25	174	23		4			6	10	5	7	359	21		2						

Region	Third mate										Pilots						Master mate				Total		
	Ocean		Coastwise		Great Lakes		B. S. & L.		Rivers		Great Lakes		B. S. & L.		Rivers		Uninspected vessels, high seas				Original	Renewal	Grand total
	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R			
Atlantic coast	304	7											33	92				1		1	669	228	897
Gulf coast	25	2											11	27		1					79	68	147
Great Lakes and rivers											3	1	1	8	18	15					30	54	84
Pacific coast	123	1											31	50				12	2		421	133	554
Total	452	10									3	1	76	177	18	16		13	2	1	1,199	483	1,682

ENGINEER OFFICERS

Region	Chief engineer, steam				First assistant engineer, steam				Second assistant engineer, steam				Third assistant engineer, steam			
	Ocean		Inland		Ocean		Inland		Ocean		Inland		Ocean		Inland	
	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R
Atlantic coast	80	89	7	44	91	44		5	192	25	1	1	307	17		1
Gulf coast	14	20	3	7	12	4		3	31	3			16	5		
Great Lakes and rivers	4	6	5	22	4	1	2	9	4	2		1	3		1	
Pacific coast	39	48	2	12	57	12		2	121	17			196	5		
Total	137	163	17	85	164	61	2	19	348	47	1	2	522	27	1	1

Region	Motor vessels								Uninspected vessels				Totals		
	Chief engineer engineer		First assistant engineer		Second assistant engineer		Third assistant engineer		Chief engineer		Assistant engineer		Original	Renewal	Grand total
	O	R	O	R	O	R	O	R	O	R	O	R			
Atlantic coast	28	53	9	21	10	13	227	1				1	952	315	1,267
Gulf coast	3	11	4	4	1		4						88	57	145
Great Lakes and rivers	1	10	2	8		1	1						27	60	87
Pacific coast	11	20	6	7	10	3	164	5	1	3	1	1	608	135	743
Total	43	94	21	40	21	17	396	6	1	3	1	2	1,675	567	2,242

ORIGINAL SEAMEN'S DOCUMENTS ISSUED, MONTH OF OCTOBER 1945

Region	Continuous discharge book	Certificate of identity	A. B., green, 3 years [1]	A. B., green, 9 months emergency [1]	A. B., blue, 18 months, 12 months [1]	A. B., blue, 6 months emergency [2]	A. B., blue, 6 months emergency [2]	Lifeboat, 12-24 months [4]	Lifeboat, 6-12 months emergency [4]	Q.M.E.D., 6 months	Q.M.E.D., emergency	Radio operators	Certificate of service	Tankerman	Staff officer	Total
Atlantic coast	20	6,246	85	230	101	22	0	1,783	0	213	420	56	5,805	10	143	15,134
Gulf coast	45	1,312	10	47	0	0	0	215	0	58	174	2	1,191	9	26	3,089
Pacific coast	10	7,098	23	89	47	3	0	1,554	0	143	569	2	6,339	4	68	15,949
Great Lakes and rivers	1,124	585	6	6	8	12	1	27	0	43	42	1	1,534	11	1	3,401
Total	1,199	15,241	124	372	156	37	1	3,579	0	457	1,205	61	14,869	34	238	35,773

[1] Unlimited.
[2] Great Lakes, lakes, bays, and sounds.
[3] Tugs and towboats and freight vessels under 500 tons (miscellaneous).
[4] 12 months deck or 24 months other departments.
[4] 6 months deck or 12 months other departments.

NOTE.—There were 89 Panamanian Employment Cards issued.

WAIVERS OF MANNING REQUIREMENTS FROM 1 OCTOBER TO 31 OCTOBER, 1945

Authority for These Waivers Contained in Navigation and Vessel Inspection Circular No. 31, Dated 13 March 1943

Region	Number of vessels	Deck officers substituted for higher ratings	Engineer officers substituted for higher ratings	Able seamen substituted for deck officers	Ordinary seamen substituted for able seamen	Qualified members of engine department substituted for engineer officers	Wipers or coal passers substituted for qualified members of engine department	Wipers, coal passers or cadets substituted for engineer officers	Ordinary seamen or cadets substituted for deck officers	Total
Atlantic coast	409	46	106	12	852	11	208	2	12	1,249
Gulf coast	156	42	69	2	402	2	84	2	6	609
Pacific coast	454	150	267	35	1,413	117	661	42	11	2,696
Great Lakes	243	2	9	3	577		151			742
Total	1,262	240	451	52	3,244	130	1,104	46	29	5,296

CREW SHORTAGE REPORTS FROM 1 OCTOBER TO 31 OCTOBER, 1945

These Reports Submitted in Accordance With Navigation and Vessel Inspection Circular No. 34, Dated 1 May 1943

Region	Number of vessels	Ratings in which shortages occurred												Total
		Chief mate	Second mate	Third mate	Radio	Able seamen	Ordinary seamen	Chief engineer	First engineer	Second engineer	Third engineer	Qualified member engine department	Wiper or coal passer	
Atlantic coast	20					15	18		1	1	3	11	2	51
Gulf coast	16	1		1	4	6	4	1	2	1	2	11	3	36
Pacific coast	19		1	4	1	6	4		2	2		11	2	33
Great Lakes	224	1		10		169	56		2	7	15	254	113	627
Total	279	2	1	15	5	196	82	1	7	11	20	287	120	747

HAND FIRE EXTINGUISHERS - AND HOW TO USE THEM

	CLASS A FIRES (WOOD, PAPER, RUBBISH)	CLASS B FIRES (OIL, GREASE, LIQUIDS)	CLASS C FIRES (ELECTRICAL EQUIPMENT)
SODA-ACID EXTINGUISHER	YES	NO	NO
CARBON DIOXIDE EXTINGUISHER	NO	YES	YES
FOAM EXTINGUISHER	YES	YES	NO
VAPORIZING LIQUID EXTINGUISHER	NO	YES	YES
DRY CHEMICAL EXTINGUISHER	NO	YES	YES
WATER EXTINGUISHER	YES	NO	NO

SODA-ACID EXTINGUISHER

. . . is one of the most common types of fire extinguishers. The extinguisher contains a solution of bicarbonate of soda in water. A cage holds a small bottle of sulphuric acid in the neck of the extinguisher. When the unit is turned upside down, the acid is spilled and mixes with the bicarbonate of soda solution. The chemical reaction which takes place forms a gas, creating pressure which expels the solution.

CARBON DIOXIDE EXTINGUISHER

. . . holds liquid carbon dioxide under pressure of 850 pounds per square inch. When the extinguisher is used, the valve on top of the unit is opened. This releases heavy pressure within the extinguisher, forcing the liquid out. The liquid carbon dioxide, upon contact with the air, turns into a gas, which has a blanket effect on fires, shutting off the oxygen supply and preventing the fire from "breathing."

FOAM EXTINGUISHER

. . . contains a solution of bicarbonate in water, plus a foam stabilizing agent. Within a smaller container in the neck of the extinguisher is another solution, this one composed of aluminum sulphate. When the extinguisher is inverted, these two solutions are mixed, and a foamy substance, consisting of carbon dioxide gas confined in tough, durable bubbles is thus produced, serving to smother the fire.

VAPORIZING LIQUID EXTINGUISHER

. . . is useful in combating electrical fires, as its solution is a non-conductor of electricity. The carbon tetrachloride expelled is vaporized into gas by the heat of the fire. When applied to oil fires it has a tendency to cast a smothering blanket over the burning oil. DO NOT use in confined areas — at high temperatures the chemical breaks down to yield highly-poisonous phosgene gas!

DRY CHEMICAL EXTINGUISHER

. . . contains dry chemical. Inserted is smaller container of inert gas under pressure, released for operation by turning the valve on top of the extinguisher. The container is set in an upright position, and a stream or cloud of the gas mixed with the chemical powder, under control by a nozzle at the end of the hose, is directed at the base of the fire, quickly dispersing smoke, fumes, and flames.

WATER EXTINGUISHER

. . . contains plain water. Cradled in a cage in the neck of the unit is a small bottle of carbon dioxide. When the extinguisher is inverted and bumped upon the ground, the cap of the carbon dioxide bottle is pierced, releasing the gas. This creates internal pressure which expels the water. In some types of water extinguishers manual pumping is substituted for the method of expulsion by carbon dioxide gas.

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