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PROCEEDINGS OF THE
MERCHANT MARINE COUNCIL
UNITED STATES COAST GUARD

Vol. 3 July 1946 No. 7

Proceedings of the

MERCHANT MARINE COUNCIL

Published monthly at Coast Guard Headquarters, under the auspices of the Merchant Marine Council, in the interest of safety at sea. There are no restrictions on the republication of material appearing in this issue

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The Cover: Fighting test oil fire in machinery space on a Liberty Ship.

COUNCIL ACTIVITIES

The Council recommended approval of the amendment to Section 302.30 of 33 C. F. R., which establishes a line of demarcation between inland waters and the high seas for Chesapeake Bay and tributaries. The new line, effective on and after 1 August 1946, runs from the Cape Henry Lighthouse to the Cape Henry Junction Lighted Whistle Buoy and thence to the Cape Charles Lighthouse. A public hearing was conducted by the Commander of the Fifth Coast Guard District, Norfolk, Va., and comments were received from various interested parties which were considered prior to the recommendation of the change.

The danger signal contained in the Pilot Rules for the Great Lakes was recommended to be changed from "not less than four" to "not less than five" short and rapid blasts of the whistle, to be made effective on and after 1 August 1946; the sections of the Great Lakes Pilot Rules to be amended are 322.2 and 322.8 of 33 C. F. R. The change in the danger signal for the Great Lakes was recommended by the merchant marine industry on the Great Lakes in statements submitted by them.

The effective date for requiring the new electric water lights for tank vessels to be in accordance with Coast Guard specifications was extended from 1 July 1946 to 1 January 1947. The approved electric water lights are allowed on all merchant vessels where approved self-igniting water lights are required by the regulations.

The Merchant Marine Council considered proposed amendments to the existing Port Security Regulations in order that these regulations may conform with the rescission of authority formerly reposed in the Secretary of the Navy and delegated by him to the Comandant of the Coast Guard, covering matters of port security and the rescission of regulations covering movement licenses, security regulations for vessels in port, regulations for the protection of waterfront facilities, and air raid and blackout regulations for vessels, harbors, ports, and waterfront facilities.

Consideration was given to the new program requiring that approvals of equipment be modified by assigning them individual approval numbers and by limiting the duration such approvals will be in effect to 5 years, unless sooner canceled or suspended by proper authority. The manufacturer will be notified approximately 3 months in advance of the date that his approval for a specific item will expire. If the holder of the approval desires, he may have the approval renewed for another period of 5 years upon specific request. If no request for renewing the approval is received from the holder, then the approval will be terminated.

Waiver Authority Extended

The authority to issue waivers under Section 501 of the Second War Powers Act was extended again to 31 March 1947 by an Act of Congress. This extension of waiver power will continue in effect all waivers granted by the Coast Guard until 31 March 1947, unless sooner cancelled or revoked by proper authority.

New Numbering and Certificating System for Approved Equipment

Various items of lifesaving, firefighting, and miscellaneous equipment used aboard merchant vessels and motorboats are required by statute and regulations to be of types which are approved by the Commandant. Other requirements specify that some kinds of items may be accepted for use on board merchant vessels upon submission of an affidavit by the manufacturer that the requirements of the regulations have been met. In other cases, drawings and specifications for equipment are examined in order to advise manufacturers and prospective purchasers whether the item, when manufactured or installed, will be acceptable for marine use.

It has been noted that at the present time there is need for more systematic information concerning equipment approved, manufactured under affidavit, and found satisfactory for marine use. In order to supply convenient, accurate, and up-to-date information in this respect, both for the reference of marine inspectors in the field and by ship constructors and operators, the Coast Guard has had under consideration various plans for the development of a uniform procedure with respect to the maintenance of records and issuance of information concerning such equipment.

It has been determined that the following system can be established which will provide an effective arrangement of the material referred to above:

1. *Equipment Records Section.*—The formation of an Equipment Records Section in the Merchant Marine Technical Division at Coast Guard Headquarters. The duties of this section will be to inaugurate and maintain records of all equipment approvals granted by the Commandant, together with records of all affidavits issued covering items classified as "B" material as covered by Marine Engineering Regulations and Material Specifications, or otherwise treated separately from those items of equipment required to be approved by statute or regulation.

2. *Approval Recording Procedure.*—As each item of equipment is approved by the Commandant, the Equipment Records Section will assign an approval number. This number will identify a specific item and if at a later date the manufacturer ceases to make the item or the approval is withdrawn, the number will be "dead" and will not be issued to any other item. If modifications are made to an approved item, the approval number will be changed to include a modification designation.

3. *Certificate of Approval.*—Certificates of approval will be issued to manufacturers of items which require approval by the Commandant. This certificate of approval will contain the date, approval number, name of manufacturer, a brief description of the item, and the expiration date of approval. In addition, the certificate will contain instructions regarding modifications and all stipulations made relative to the manufacture and sale of the item for use on vessels subject to marine inspection laws. When an item of approved equipment is modified, a new certificate, showing the necessary data and modification of the approval number, will be issued. All certificates shall be valid for a period of five years, unless sooner canceled or suspended by proper authority. The certificates will contain all identification of material pertaining to the item approved and the conditions of approval maintenance. Certificates of approval are not transferable but may be renewed from time to time at termination of approval dates if the item is still required and the manufacturer is still in business.

4. *Renewal of Certificates of Approval.*—Holders of certificates of approval will be notified in advance of the expiration date of all outstanding approvals. It shall be incumbent upon the holder to indicate a desire to remain on the approved list by appropriate reply. In the absence of a reply to the Coast Guard's letter regarding the termination date, the name of the holder of such certificate of approval will be removed from the current list of approved manufacturers. In this manner all "dead wood" can be eliminated from the current record. For the purpose of maintaining data on items no longer manufactured or carried in current listings, a file will be kept for general reference at Coast Guard headquarters.

It is proposed that as each item of equipment is approved, an approval file card will be made and duplicated for the visible index card files at Coast Guard Headquarters and also to be forwarded to the field so that all district offices and local marine inspection offices will have a complete visible card system showing current information relative to approved equipment. Each field office will receive a card file arranged in the same manner and will be furnished with copies of all subsequent approval cards as they are prepared in order that current information relative to approved equipment will be maintained. The file cards will be of special design, 3'' x 5'' size, and will be set up as indicated in the photograph. It should be noted that near the bottom of the card, space is provided for the inclusion of information relative to previous modifications. In this way, it will not be necessary to have more than one card for any specific design. It is proposed that standard identification will be adopted for each type of equipment so that when a file card is prepared by the Equipment Records Section, all other cards of the same type will bear the same points of identification.

Approvals that have been withdrawn or have become inactive will be noted on current cards identical with the approval cards except as to color. The card will contain a notation stating the reason for discontinuance of the article and whether it is intended to merely stop the manufacture of the article or to have it removed from all vessels.

From these cards an annual listing can be quickly prepared for publication and distribution to the marine industry.

A sample drawer showing how the card records for approvals of equipment will be kept.

UNITED STATES OF AMERICA

UNITED STATES COAST GUARD

Certificate of Approval No. 160.017/4/1

Date 16 June, 1946

Ladder, [illegible] Embarkation

[illegible]

711 Maine Avenue

Trenton, New Jersey

This certifies that the item of equipment specified herein has been approved by the Commandant, United States Coast Guard, in accordance with provisions of the laws governing marine safety and regulations promulgated thereunder. Public notice of this approval appeared in the Federal Register of this date. This approval supersedes

Approval No. 160.017/4/0 dated 16 March, 1946

SAMPLE

IDENTIFICATION

Ladder, Embarkation - Debarkation, Type XLED, chain suspension, Drawing No. XL-2842 dated 3 March, 1944, revised 6 June, 1946.

REMARKS

None

MARKING

Shall have branded or otherwise imprinted on rungs or ears, at intervals not over five feet, "Type XLED, chain suspension ladder manufactured by X. Co., 711 Maine Ave., Trenton, N.J."

CONDITIONS OF APPROVAL

This certificate, which is subject to the terms* stated on the reverse side, is not transferable and is effective until 5 years after date unless sooner canceled or suspended by proper authority.

By direction of the Commandant.

[signature]

Chief, Office of Merchant Marine Safety

NAVCG 10630

*The terms on the reverse side of the Certificate of Approval read as follows:

TERMS

When materials or devices covered by the approval set forth on the face hereof are to be in production, the Commander of the Coast Guard District in which the factory is located shall be notified in sufficient time to assign an inspector to the plant for the purpose of making any necessary inspections or tests.

The approval of the item covered by this certificate is valid only so long as said item is manufactured in conformance with the details of the approved drawings and specifications referred to on the face hereof. No modification in the approved design, construction, or materials is to be adopted until same has been presented for consideration through the Commander of the Coast Guard District and confirmation received that the proposed alteration is acceptable.

Attached hereto are approved copies of the following drawings and/or specifications:

XL–2842 dated 3 March 1944, revised 6 June 1946

Twenty-five copies of the following drawings and/or specifications shall be forwarded to The Commandant (MMT), United States Coast Guard, Washington 25, D. C., for distribution to the various field offices.

As indicated above, the expiration date will be set on each approval. This is felt necessary as certain manufacturers have an item approved, build a few units, and then discontinue production. At present, there is no way of indicating which approvals are active and therefore much "dead wood" accumulates in the records. Constant changes are being made not only to Coast Guard Regulations but also in production methods so that original data on outstanding approvals is often outmoded. By limiting the duration of approval to 5 years, it will be possible to keep all data current on approved equipment.

Briefly, the new system for handling equipment will provide the following:

1. Each item of equipment approved will be issued an approval number.
2. Each item of equipment approved will be identified by a Certificate of Approval issued to the manufacturer.
3. Each approval will be limited in duration to a 5-year period, but the manufacturer will be notified prior to the termination of such period, and if there have been no changes in Coast Guard requirements, and the manufacturer is still producing the item without modification, he simply requests and will receive an extension for an additional 5-year period.
4. Each marine inspection field unit will have an up-to-date visible card index of all approved equipment.
5. Printed listings of approved equipment will be published for distribution to the marine industry and interested public.

Those items of equipment which comply with Coast Guard regulations and standards will be assigned individual approval numbers and the holder notified of the action taken by the Coast Guard. In some cases it will be necessary to terminate approvals, but before such actions are taken, the manufacturers or holders of the approvals will be contacted and informed of the actions proposed whenever possible.

Where an approval of equipment has been terminated, the holder of the approval concerned will be given an opportunity to appeal such action and submit such statements and data as he may desire or which may be requested by the Coast Guard. It is not intended by terminating any approval that equipment which was approved when installed has to be removed. Such equipment may be continued in service so long as it is in good and serviceable condition. By terminating the approval means that the item of equipment can no longer be approved for use on merchant vessels subject to the inspection laws and regulations.

Test Fire in Cargo Hold of Liberty Ship

The interest expressed in the previous experiments in the control of fires resulted in the formation of a joint operation participated in by the Transportation Corps, Army Service Forces; Bureau of Ships, Navy Department; Research Division, Maritime Commission; War Shipping Administration; and the Coast Guard.

A committee was appointed with representatives from each government agency and the Coast Guard was designated as the operating agent. Representatives of industry associated with merchant vessel operation, vessel designers and builders, marine underwriters, the International Association of Fire Chiefs, manufacturers of safety appliances and fire extinguishing equipment were invited to participate in these experiments and to name representatives to constitute an advisory committee. This invitation was readily accepted and the representatives of industry have contributed much to the development of the test program.

The actual tests were begun on 27 May 1946 at San Francisco, Calif., on board a converted Liberty-type vessel at an anchorage off Treasure Island in San Francisco Bay.

The vessel used in this experiment is a converted Liberty type formerly used as a fleet supply vessel by the Navy. The tween decks of this vessel have been converted to form crew and service space. The lower holds remain intact. The initial tests utilized Nos. 4 and 5 lower holds. The hatches serving these holds have been reduced in size to approximately one-half normal size and trunked between the weather deck and the tween deck with regular strongbacks and hatch covers fitted at the tween deck. The No. 4 trunk has a nonwatertight door fitted at the tween deck level. The No. 5 trunk has no openings. Two cowl-type ventilators were fitted on top of the deckhouse located on the weather deck immediately over the division bulkhead between Nos. 4 and 5 holds; one ventilator to starboard and one ventilator to port. The starboard ventilator trunk was divided into two ducts; one duct serving No. 4 hold, and one duct serving No. 5 hold. The division plate forming the two ducts terminated just below the base of the vent cowl. The port ventilator trunk also served as an escape trunk with two nonwatertight doors fitted in each duct; one in the deckhouse at the weather deck level, and one in the tween decks at the tween deck level. A combination carbon dioxide and smoke-detecting system of piping was fitted in these cargo holds in accordance with existing Coast Guard regulations governing merchant vessels. An approved type of smoke detector and automatic alarm was fitted in the bridge house. The bank of carbon dioxide cylinders was installed in the tween deck over No. 5 hold.

For the initial experiments the cargo consisted of cotton of standard density-type bales weighing approximately 470 pounds each. Future experiments will involve a general type of cargo.

Test No. 1 was conducted in the No. 5 hold which was partially loaded with cotton. The 165 bales of cotton were stowed on the starboard side between the shaft tunnel and the skin of the vessel, and from the forward bulkhead to within a few feet of the after bulkhead to a height of about one-half bale of the top of the shaft tunnel. After the cotton was stowed in the hold, the tween deck hatch strongbacks and wooden hatch covers were fitted in place. Asbestos paper approximately one-eighth inch in thickness was laid over the top of the hatch covers, care being taken to fit this paper close to the sides of the hatch trunk and to overlap the edges of each layer of paper to form a tight cover. One layer of bunk mattresses was laid on top of the asbestos paper to help make a tight seal.

After the hold was closed off the cotton was ignited by means of an electric resistance unit located in the center of the stowage between bales of cotton at a depth of one bale below the top surface. The first indication of fire in the hold showed at the smoke indicator cabinet 17 minutes after ignition. The audible alarm at the smoke indicating cabinet began to sound 34 minutes after ignition. The thermocouple located in the bale nearest the fire indicated a temperature of 1,005° at this time. The general air temperature in the hold taken at the underside of the tween deck showed 290° F. Work was begun in sealing off the vent trunks. The port trunk was sealed off 50 minutes after the fire was ignited. The starboard ventilator trunk was first plugged 1 hour and 15 minutes after ignition. At the time the port trunk hatch was plugged the thermocouple reading in the bale was 1,320° F. and the general temperature in the hold at the underside of the tween deck was 166° F. The maximum temperature on the bulkhead separating Nos. 4 and 5 holds was 105° on the starboard side.

The fire in the cotton was allowed to burn for 5 hours after ignition before carbon dioxide was introduced in the hold. During this period intermediate samplings of gases were made and temperature readings were constantly observed. Interval readings showed the following conditions existing in the hold:

Tuesday:

3:45 p. m.—Cotton ignited.

4:18 p. m.—Thermocouple in bale 1005° F. Air temperature in hold (underside of tween deck) 290° F.

4:30 p. m.—Gases in hold. Oxygen 14.4; carbon dioxide, 6.3; carbon monoxide, 0.8.

4:37 p. m.—Thermocouple in bale 1320° F. Air temperature in hold 166° F.

4:50 p. m.—Bulkhead between No. 4 and No. 5 hold (top portion starboard side) 105° F.

5:00 p. m.—Sealing of hold completed.

5:20 p. m.—Thermocouple in bale 430° F.* Air temperature in hold 108° F.*

5:56 p. m.—Gases in hold. Oxygen 7.8; carbon dioxide 11.8; carbon monoxide 1.4.

7:20 p. m.—Gases in hold. Oxygen 7.2; carbon dioxide 12.0; carbon monoxide 2.0.

8:25 p. m.—Gases in hold. Oxygen 6.0; carbon dioxide 21.0; carbon monoxide 1.5+. Temperature of thermocouple in bale 135° F.; air temperature in hold 68° F.; temperature of bulkhead tween No. 4 and No. 5 holds 60° F.

Closing off the hold and sealing the ventilator trunks and tween deck hatch covers resulted in knocking down the fire to a marked degree. As a result of this experience it is planned to simulate the conditions of stowage and run a "burn out" test to determine an end result over a period of 3 or 4 days. Exclusion of oxygen by closing off means of intake of air may prove a valuable approach to the control of fires in cargo holds.

Tuesday:

8:50 p. m.—CO_2 was first admitted to hold.

8:56 p. m.—Fourteen cylinders of gas had been introduced.

9:05 p. m.—Twenty cylinders of gas had been introduced.

9:07 p. m.—Gases in hold. Oxygen 6.4; carbon dioxide 26.5; carbon monoxide 2.6; temperature of thermocouple in bale 95° F.; air temperature in hold 58° F.

*Attention is invited to the difference in these two readings as of 4:37 p. m. and 5:20 p. m. It is believed the 4:37 reading represents an initial flash burning with considerable heat momentarily generated; the fire then receding and settling down to a steady rate of burning.

9:10 p. m.—Started release of 20 additional cylinders of carbon dioxide .

9:28 p. m.—Discharge of cylinders completed.

9:55 p. m.—Gases in hold. Oxygen 5.4; carbon dioxide 35.5; carbon monoxide 2.1.

10:00 p. m.—Started release of 10 additional cylinders of carbon dioxide. Temperature of thermocouple in bale 80° F.; air temperature in hold 55° F.; temperature of bulkhead tween No. 4 and No. 5 hold 50° F.

10:10 p. m.—Discharge of cylinders completed.

10:37 p. m.—Gases in hold. Oxygen 4.5; carbon dioxide 41.5; carbon monoxide 2.0.

Wednesday:

12:30 a. m.—Visual observation by means of peephole sight fitted in forward bulkhead of hold showed that the smoke had cleared sufficiently to permit seeing after bulkhead of No. 5 hold.

1:46 a. m.—Started release of 10 additional cylinders of carbon dioxide. This made a total of 60 cylinders or 3,000 pounds of gas used in this test.

2:30 a. m.—Gases in hold. Oxygen 4.3; carbon dioxide 45.8; carbon monoxide 1.9.

4:00 a. m.—Temperature of thermocouple in bale 50° F. Air temperature in hold 40° F.; temperature of bulkhead between No. 4 and No. 5 holds 40° F.; carbon dioxide in hold 46 percent. Atmospheric temperature 55° F.

The over-all conditions were checked and maintained without change. Observations were made periodically, temperatures noted and meter readings of gases present in the hold were taken. There were no appreciable changes noted. At 12 m., on Wednesday meter readings showed gases in the hold as follows:

Oxygen 4.9; carbon dioxide 43.6; carbon monoxide 1.8.

Three men equipped with oxygen breathing apparatus entered the hold by means of the escape trunk hatch and brought up samples of burnt cotton. They reported no visual signs of fire in the cargo. Cotton bales at point of ignition were cool to the touch. Evidence of extensive surface burning and charring were observed. The samples of charred cotton brought out of the hold were cool to the touch, apparently were not completely burned, and did not reignite when exposed to the air. The escape hatch was resealed and all conditions maintained constant.

Wednesday:

4:00 p. m.—Gases in hold. Oxygen 4.7; carbon dioxide 44.0; carbon monoxide 1.9.

Thursday:

11:00 a. m.—No further meter reading or sampling of gases was made until this time when an average of four readings showed: Gases in hold. Oxygen 5.4; carbon dioxide 41.2; carbon monoxide 1.8.

All conditions were maintained constant. Various observations, temperature readings and sampling of gases were performed throughout Thursday.

Friday:

9:45 a. m.—Gases in hold. Oxygen 6.2; carbon dioxide 39.4; carbon monoxide 1.8; temperature of thermocouple in bale 45° F. Air temperature in hold 43° F. Temperature of bulkhead between No. 4 and No. 5 hold 40° F. Atmospheric temperature 58° F.

Attention is invited to the following table giving a comparison of the readings taken at 10:37 p. m. on Tuesday, 6¾ hours after ignition of the cotton, following the introduction of 50 cylinders (2,500 pounds) of carbon dioxide gas; with readings taken at 2:30 a. m. on Wednesday, 10¾ hours after ignition, with 10 additional cylinders of carbon dioxide having been introduced into the hold for a total of 3,000 pounds of gas; and with readings taken at 9:45 a. m. on Friday, 59¼ hours after ignition, about 1½ hours before the hold was opened for removal of the burnt cargo.

Time	O_2	CO_2	CO	Pounds CO_2 used
	Per-cent	*Per-cent*	*Per-cent*	
10:37 p. m. Tuesday	4.5	41.5	2.1	2,500
2:30 a. m. Wednesday	4.3	45.8	1.9	3,000
9:45 a. m. Friday	6.2	39.4	1.8	.....

The fact that this hold was sealed as tightly as possible no doubt accounts for the fact that following the introduction of 3,000 pounds of carbon dioxide gas, and after a lapse of 55¼ hours the concentration of carbon dioxide in the hold was reduced only 6.4 percent.

At 11:00 a. m. on Friday operations commenced in opening up the hold to remove the cargo. An air remover was placed in the port vent trunk at the weather deck. Steam was used to activate the air remover. The main hatch tarpaulin and one hatch cover were removed. The ventilator seals were removed. Ten minutes thereafter all hatch covers at the main hatch were removed. With air remover in operation the air flow down starboard ventilator measured 4,500 cubic feet per minute. With air remover cut off ventilation down starboard ventilator was nil. After approximately 1 hour of operation of the

An applicator is used to cool a skylight before covering it with canvas to choke off the air supply as the first step in combatting an oil fire in the engine room. This was one of the new methods studied at the Coast Guard Training Station, Fort McHenry, Md., where a Liberty ship was used for tests under actual conditions.

air remover the seal over the tween deck hatch covers and the hatch covers themselves were removed. At the end of approximately 3 hours of operation of the air remover, stevedores commenced discharging burnt cotton. A survey of the bales of cotton as they were taken from the hold showed 40 bales burned to a depth of 8 inches in some spots; 45 bales slightly burned; 14 bales scorched; and 31 bales undamaged. Upon removal the bales were placed in an open steel barge and examination over a period of 3 successive days revealed no evidence of reignition.

The experimental program is continuing and further tests are under way. It is too early to form any definite conclusions as to what information may eventually be developed as a result of these tests. However, from experience up to the present it is believed that information will be developed which is essentially valuable to vessel designers, operators, officers and crews of vessels, and to port fire departments. It is likely that some presently held theories with reference to fire fighting on board vessels and to characteristics of fires will be subject to change in the light of results obtained by this experiment.

Comparative Rules of the Road

The Merchant Marine Council, United States Coast Guard, announces the publication of a new booklet entitled COMPARATIVE RULES OF THE ROAD AND HOW TO OBEY THEM.. The booklet, which is for free distribution, is part of the Council's educational program to prevent marine collisions and discusses, with numerous explanatory notes, the statutes and regulations effective on the high seas, coastal inland waters, Great Lakes, and western rivers. In this respect it differs from all pamphlets on the subject which have been previously issued and which were restricted to the bald statement of the Rules themselves. As suggested in the title, the purpose of the booklet is not only to present the Rules in readable form but to do a "spot" of teaching in regard to obedience.

The booklet is profusely illustrated with 63 plates and more than 200 illustrations drawn by artists of the Government Printing Office Design Section, picturing vessels in various approaching situations and the lights which they are required to carry. The pictures illustrating lights are presented, for the most part, four on a page so that the reader can see at a glance the difference in lighting requirements on the high seas, on the coastal inland waters, on the Great Lakes, and on the western rivers.

The COMPARATIVE RULES OF THE ROAD is a departure in several other ways from the conventional government rules of the road pamphlets. With the teaching objective in mind, an effort has been made to emphasize important principles in the prevention of collisions and to keep before the reader certain slogans and "key" suggestions which if neglected may lead to accident and if obeyed must contribute to safety. On the back of the title page a printed admonition in large type advises the reader, "REMEMBER YOUR SHIPMATES, CONSTANT VIGILANCE IS THE PRICE OF SAFETY, ALWAYS KEEP A GOOD LOOKOUT." Another page sets out in block type the reminder that "MARINE COLLISIONS: (1) Cost human lives. (2) Sink seaworthy vessels. (3) Lose vital war cargoes. (4) Aid and comfort the enemy. (5) Delay winning the war. (6) Are nearly all preventable." The introduction includes the discussion of general principles to be observed in all waters to prevent collision and proceeds to point out that:

Every mariner will do well to remember these four cardinal points in the prevention of collision:

First, a proper lookout.—A proper lookout is the eyes and ears of the ship. His job is to discover as early as possible the approaching vessel and to report that discovery to the officer on watch. The importance of the lookout can scarcely be overestimated. Because of his importance, the courts require: (a) That he be an experienced seaman; (b) that he have at the time no other duties, such as steering, etc; (c) that he be alert and vigilant; (d) that he be stationed as low down and as far forward on the vessel as possible, and (e) that a sufficient number of lookouts be stationed to detect an approaching vessel from any direction.

Second, the taking of bearings.—Having discovered an approaching vessel, it is not sufficient to judge her position during a subsequent approach by eye alone. Bearings should be taken as soon as a vessel is sighted, and at repeated intervals thereafter, to determine whether or not risk of collision exists. A stationary bearing whether taken by compass, pelorus or bearing board, is positive evidence that without remedial action, collision will occur. The direction and amount of change in bearings determines when such risk ceases, and on which side safe clearance will be made.

Do not regard the taking of bearings as a chore. Instead, recognize the operation as a convenient and reliable method of relieving your own tension whenever an approaching situation develops. If the first two or three bearings show a definite change there can be no collision as long as conditions remain the same. If the bearings are constant you have equally certain information that without positive action by one or both vessels collision is inevitable, and *can determine and carry out in plenty of time the action best calculated to avoid it.*

Third, proper lights at night.—The function of lights is to reveal to an approaching vessel the nature and to some extent the course, of your vessel. Between sunset and sunrise be sure you have proper lights burning brightly. This should be checked and reported by the lookout not only at half hour intervals, but again *whenever an approaching vessel is reported.*

Fourth, the use of whistle signals.—The sounding of whistle signals is prescribed by every code of rules for the specific purpose of announcing audibly action intended to avoid collision. On the high seas such signals are required for any proper change of course when another vessel is in sight. In all of the various inland rules an exchange of passing signals is required regardless of a change in course, if the approach is, or will be, within half a mile. The unwarranted omission of the required whistle signals has become one of the principal causes of marine collisions. Do not neglect to observe whistle requirements, nor to repeat signals which apparently are not heard or understood the first time.

This is followed by a summary of important points of similarity and difference which the mariner must look for if he is to give the rules the intelligent obedience necessary to keep out of trouble. To quote:

IMPORTANT POINTS OF SIMILARITY IN THE RULES

A careful reading of the rules to prevent collisions on the high seas, coastal inland waters, the Great Lakes, and Western Rivers, reveals a surprising degree of uniformity in principle, despite numerous differences in detail.

It is no doubt this uniformity which is the strength of the rules, just as the differences may be said to constitute their chief weakness. With the large and increasing volume of traffic moving from one jurisdiction to another, it is more than ever unfortunate that uniform rules satisfactory to all regions have not been developed. However, the following points may be regarded as already uniform:

1. Approaching steam vessels in good visibility are classified into three situations: meeting, overtaking, and crossing.

2. Approaching sailing vessels are classified and required to pass one another in accordance with their courses in respect to the direction of the wind which propels them both.

3. Two steam vessels are said to be meeting if their courses are substantially, or within a point or two of, opposite, or if, as in the case of a winding river, they will become opposite at the point where they meet, even though they may first sight each other at right angles. In open water, under all the rules alike, meeting vessels are required to pass port to port, unless they are already so far to the starboard of each other that they will clear on that side a safe distance without changing course. In order that they may pass safely port to port, a sufficient change of course to the right is required of both vessels, not in the jaws of collision, but at such a safe distance apart and a sufficient number of degrees to avoid even getting into dangerous proximity.

4. An overtaking vessel is one going in the same direction, or within six points of the same direction, as a slower vessel ahead. The rules are uniform in recognizing that the leading vessel was there first, and that the overtaking vessel must take positive action to keep clear of her as long as risk of collision remains. It is

par excellence a situation of privilege and burden, with the accompanying obligations of the privileged vessel to keep course and speed, and of the burdened vessel to take all the positive action necessary to keep clear. This principle of privilege and burden is common to all sets of rules, not only in the overtaking situation but when two steam vessels are crossing, when a steam vessel meets a sailing vessel, when a sailing vessel approaches a sailing fishing vessel, and when one ordinary sailing vessel approaches another.

5. Two steam vessels are said to be crossing when one approaches the other on either side in the arc between meeting and overtaking, i. e., from a point or two on the bow to two points abaft the beam. In all four jurisdictions the rules require the privileged crossing steam vessel, i. e., the one having the other on her port hand, to keep course; and, in three of them to keep her speed, until definite remedial action becomes necessary; and the burdened steam vessel to keep clear, to avoid crossing ahead, and if necessary, to slacken speed, or stop, or reverse. When the two steam vessels arrive in dangerous proximity both are required, under the rules, to take positive action to avert collision. In other words the rules are unanimous in providing that no vessel has the right of way *through* another vessel.

6. In thick weather, there are numerous differences in prescribed sound signals, but the rules in fog are uniform in the following important respects: (a) All vessels are required to give notice of their approach by signals on the whistle, siren, or fog horn, and these signals must be given at frequent intervals. (b) Vessels in fog must go at moderate speed, which has been defined by the Supreme Court as bare steerageway, or at such speed as will enable the vessel to come to a standstill in half the distance of visibility. The theory of preventing collisions in fog is the same in all jurisdictions. Collision is to be prevented, *not by dodging, but by stopping.* The International, Inland, Great Lakes, and Western Rivers Rules are common in providing that whenever a fog signal is heard in a specified arc ahead, speed shall be reduced.

7. The rules are alike in recognizing that situations may arise where specific rules will not work, and where departure from these rules is accordingly necessary. Such departure to avoid immediate danger is authorized in every case by the so-called Rule of Special Circumstances.

The rules are similar in authorizing departure from the rules *for this purpose only,* and *only to the extent that such departure is necessary.* In the International and Inland Rules, the exact language of the Rule of Special Circumstances is as follows: "In obeying and construing these rules due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger." Art. 27.

8. Finally, the provision is made in each set of statutory rules for *the observance, in all weathers and situations, of good seamanship,* which is defined as "any precaution which may be required by the ordinary practice of seamen." This rule, referred to as the general precautionary rule, or the rule of good seamanship, reads in full as follows: "Nothing in these rules shall exonerate any vessel, or the owner or master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case."

IMPORTANT POINTS OF DIFFERENCE IN THE RULES

Unfortunately, there are numerous important points of difference in the several sets of rules, and a primary purpose of this booklet is to set forth these differences in such a manner that they may be easily understood and readily referred to by the mariner. The most important differences are found in the use of whistle signals, both in clear weather and in fog, and in running and anchor lights and day signals required for various types of vessels in different jurisdictions. As long as these differences are allowed to persist, it is the mariner's duty to be thoroughly familiar with them unless he is operating exclusively within one jurisdiction. Seagoing vessels invariably operate on the high seas and in inland waters, and an accurate knowledge of the International, Inland and Pilot Rules should be minimum equipment for officers of such vessels. An additional study of Great Lakes Rules or Western Rivers Rules, each with the accompanying set of pilot rules, becomes necessary when vessels are about to enter the waters which the respective rules cover.

The table of contents divides the booklet into 11 chapters or "Parts" as follows: Part I, Introduction; Part II, Meaning of Whistle Signals, except Fog Signals; Part III, The Meeting Situation; Part IV, The Overtaking Situation; Part V, The Crossing Situation; Part VI, Rules in Fog, including whistle signals; Part VII, Right of Way; Part VIII, Special Circumstances; Part IX, Distress Signals, Orders to Helmsmen and Miscellaneous; Part X, Lights for Vessels, including motorboats; Part XI, Day Marks for Vessels. In Parts III, IV, V, VI, VII, and VIII an introductory note discusses the subject matter of the chapter. For instance the following note appears at the beginning of Part VI:

NOTE.—The rules in fog deal with two important subjects: sound signals for vessels at anchor and under way, and moderate speed. In thick weather sound largely takes the place of sight as a means of giving notice of approach and as the required fog signals under way differ in numerous respects the mariner must be careful always to use the right signals in the right waters.

In all four jurisdictions it will be found that there is a common theory for preventing collision in fog. This theory, in brief, is to go at moderate speed and to avoid collision by stopping, rather than by dodging. The rules are uniform in prescribing moderate speed, which the Supreme Court defines as (1) bare steerageway, when the visibility ahead is little or nothing; (2) such speed as will enable the vessel to come to a standstill in half the distance of visibility, when the visibility is an appreciable distance. Any speed which does not conform to the definition is, in the event of collision, held excessive, and makes the vessel using it liable.

As a further means of reducing danger in fog, the rules require on the high seas and inland waters that the engines be stopped immediately upon hearing a fog signal forward of the beam. On the Great Lakes and on Western Rivers similar rules require that the speed of the vessel be reduced to bare steerageway if the signal appears to be within 4 points of ahead. These rules, like the rule of moderate speed, are strictly enforced by the courts.

Coast Guard casualty records show that in nearly all collisions in fog, excessive speed is the major contributing factor.

In addition, the individual rules are interspersed with helpful notes such as that which follows Article 16, International Rules (page 68).

NOTE.—Moderate speed, even on the open ocean, has been defined by the Supreme Court as any speed which will enable the vessel to come to a dead stop within half the distance of visibility. This, of course, is so that a vessel on opposite course will have an equal distance in which to stop after the vessels sight each other. When there is little or no visibility moderate speed becomes bare steerageway, usually not over 4 knots. In very thick weather, in crowded harbors or other regions of dense traffic, vessels should, if practicable, find an anchorage.

The mandate in this rule to stop the engines upon hearing a fog signal forward of the beam is a rigid requirement except in the rare case where such action because of strong current and the closeness of reefs or other obstructions would result in immediate danger.

The engines should be stopped the instant such signal is heard, however faintly, and not started ahead again until additional signals have given a reasonable indication of the direction and distance of the other vessel.

A number of slogans appear at appropriate places in the booklet and are summarized at the end of Part XI under the quaint caption, "ADDITIONAL SIDE LIGHTS." The following examples are typical:

"You never have the right-of-way through another vessel."

"No rule requires a privileged vessel to hold course and speed until collision is inevitable."

"Being privileged is no privilege."

"Changing course 20° is harder on the steering gear than changing 2° but easier on the blood pressure."

"An overtaken vessel is not as fast but she got there first."

"Good seamanship, like some other things, takes a lot of practice to get good at it."

"The best place to know the rules and the worst place to study them is in a collision approach."

The booklet contains 204 pages and a comprehensive index so arranged that desired information in any of the four jurisdictions may be readily obtained.

The *Comparative Rules of the Road* was compiled and edited by Capt. R. F. Farwell, USNR, who is on duty at Coast Guard Headquarters. He was assisted by Ensign Norah P. Kennedy, USCGR (W).

LESSONS FROM CASUALTIES

SCRATCH THREE LIBERTIES

Three Liberty ships became total losses as results of strandings which took place within a period of 17 days in widely separated parts of the world. In two of the groundings navigational lights were in sight and in the third the sighting of a light was not made at the expected time. These facts give cause for study as to how these strandings happened and how other strandings may be prevented.

The first grounding was on Sanda Island, Scotland, at 2252 on the night of 16 March 1946. The vessel was en route from Copenhagen to Gourock, Scotland. In making for the entrance to the Firth of Clyde the weather was overcast with a light drizzle. Visibility varied between 2 and 5 miles. At about 2225 the position was estimated to be about 8 miles south of Sanda Island and the course was changed to 90° true. Shortly thereafter, the Ship Light on Sanda Island was picked up, looming through the mist. A change of course at 2230 was made which headed the ship directly for the light on a course of 10° true. No change of course was made subsequently until the time when avoiding action was taken. Apparently it was intended to run on course 10° until crossing of the 50 fathom curve, which was about 5 miles south of the light. Checking the navigation back from the time and place of grounding indicates that instead of being 8 miles off shore, the vessel was actually only slightly more than 3 miles off at the time when it was headed for the light at a speed of about 8 knots. A chart of the locality shows that the depth gradient is very small and that many depths of more than 40 fathoms existed between the 50 fathom curve and the light. Within 1 mile of the light there is a 53 fathom spot.

The second grounding was on the coast of Peru on an overnight run between Callao and Cerro Azul. At 0600, sunrise, on 31 March 1946 the light at Cerro Azul was expected to be sighted. It was not picked up, however, and the vessel continued on a course of 140° along the coast at a speed of 7 knots. At 0640, a sounding of 7 fathoms was shown by the fathometer and course was changed to 95°, a course which headed the vessel for the shore. Speed was reduced to slow. The weather at this time was generally fair but there was a surface haze over the sea. Eighteen minutes after heading for the coast, breakers were sighted ahead. Although the engine was reversed the grounding could not be avoided. The time of grounding was about 1 hour after sunrise. Shortly before the casualty, hills beyond the shore line were visible although, as was mentioned previously, the surface haze obscured the beach.

The third grounding took place at about 0007, 2 April 1946 on Flat Ground Shoal, north of Cape Ann, Mass., while the vessel was en route to Boston from England. The visibility was clear as is evidenced by the position obtained at 2226 when the vessel was 18 miles abeam of Cape Cod Light on a course of 270° true. This course, if maintained, would have brought the vessel close to Boston Light Vessel at about midnight. However, about 15 minutes later, course was changed to 315° true to pass clear of some fishing vessels. While on this course a light was observed slightly on the port bow which the mate on watch reported as that of Boston Light Vessel. This, the master doubted, but after checking the flashes of the light he apparently became convinced that the mate was correct. One and a half hours later he realized that there must be some mistake for course was changed to 180° during which change the ship grounded.

In each of these groundings there was a fact common to all. In each case, at a time prior to grounding, there was a doubt as to the exact position of the vessel. This doubt existed at a time when the ship was in a completely safe position.

The weather conditions in two of the cases were not of the best, but they were not extremely bad. In the third, the conditions were ideal, the visibility was very good and the vessel was in an area where a number of navigational lights, on which cross bearings could have been taken, were visible.

The three situations were such that (1) in the Peruvian grounding there were no navigational aids visible; (2) in the grounding on the Scottish coast there was a single navigational light visible; and (3) in the third case there were a number of lights in sight.

Remembering that in each case there was doubt as to the exact position of the vessel, steps should have been taken to wipe out this doubt before proceeding on courses which could endanger the vessel. In the first situation where no aids were visible there was no urgency requiring the vessel to make port at a given time. In such cases the proper thing to do is to maintain the vessel in a safe position until such time as the position can be accurately fixed. Undoubtedly the surface haze which existed would have been burned off later in the morning and the aids shown on the chart and stated in the sailing directions would have become visible. Then, and only then, would it have been completely safe to venture in toward the rocky coast.

In a situation where only one light is visible the position cannot be determined by a single bearing of the light. Other steps are required. Attempt was made to fix position by soundings in conjunction with the bearing. This is one method but where the slope of the bottom is gradual it is not too reliable. If conditions permit and a highly accurate position is required a vertical angle by sextant may be taken. Or instead of heading directly for the light, leave it on the safe side and determine the position by a series of bearings on a fixed course with a run between. In any event keep the vessel on a course which cannot lead the vessel into danger.

There is little to be said about the third situation. Where doubt exists stop the vessel, positively identify the lights in sight, and fix the position by cross bearings.

When doubt as to the position of the vessel exists it indicates that in your own mind the odds are not in your favor. Don't run up the odds: "Play it Safe."

SOOT FIRES AROUND AIR HEATERS AND ECONOMIZERS

An unusually large number of soot fires have occurred in the boilers of Victory type vessels. These soot fires have caused the destruction of generating tubes, economizer tubes, air preheater tubes, and in some cases complete boilers. The boiler casualty records show that the majority of these soot fires occurred when the vessels were at the dock or maneuvering at low rates of operation in and around the harbors. Also a great many of the casualties occurred when "lighting off" cold boilers. In most of the casualties involving soot fire, the fires could have been prevented by the proper and timely application of preventive measures.

In any discussion of soot fires occurring around air heaters or economizers, the fact should be continually borne in mind that such a fire is similar to any other fire insofar as it must satisfy three fundamental conditions. First, a combustible material must be present; second, oxygen must be supplied; and third, the combustible material must be ignited in some manner and the resulting temperature must be high enough to support the combustion.

When the fires in the boilers cause heavy smoking, no matter what kind of oil is used, the tubes and metal surfaces in the gas stream soon collect thick deposits of soot and combustible materials. It is an everyday occurrence to observe ships operating at the dock or maneuvering in the harbors with plumes of black smoke emanating from their stacks. The large quantities of soot and combustible materials in the smoke quickly foul air preheater tubes, the economizer surface, and the superheater element even though the air heaters or economizers were perfectly clean prior to this time. Under port operating conditions boilers are usually operated at extremely low rates and load changes are frequently experienced. Burners are cut in and out during this type of operation, and idle burners are often kept installed over long periods of time. However, it must be recognized that when a burner is cut out the barrel is still full of oil, and the furnace heat will soon bake the oil until only hard carbon remains in the sprayer plate and chamber. The dirty burners prevent the atomizers from working efficiently in dividing the fuel oil uniformly into a foglike spray.

When fires are frequently relighted from dirty burners or hot brickwork, or if there is a delay in ignition, unburnt particles of cold oil are forced into the gas stream passing around the generating tubes, economizer tubes, air preheater tubes, and the metal surfaces of economizers causing the soot to become impregnated with cold oil. Delay in combustion during the time the furnace is being slightly flooded with cold oil from unlighted burners may cause, if the furnace is not properly purged, a furnace explosion of sufficient magnitude to ignite the combustible material deposited on the metal surfaces exposed to the gas streams. This fire may not be noticed for some time; meanwhile it is being "fanned" by the forced draft necessary to maintain the burner fires.

It is realized that port regulations occasionally run counter to correct and proper operating practices, especially in cases where boilers are fitted with air heaters or economizers and where blowing of the tubes is prohibited and screen covers are required over the stacks. When it is necessary to operate the boilers of vessels under port regulations which do not permit compliance with recommended operating practices, the operating personnel should be instructed as to the hazards involved, especially regarding soot fires.

Keeping the gas passages free from combustible material essentially implies cleanliness. Therefore, in order to maintain the fire side of boilers in proper condition, the regular use of properly installed and maintained soot blowers at frequent intervals is necessary. In addition, the tubes should be hand cleaned, when needed, as an adjunct to the use of soot blowers. Periodic inspections should be routine.

The operating personnel should be particularly vigilant during port operations to guard against the excessive accumulation of soot and combustible materials on the air heater and economizer surfaces. The operating personnel should, under limited operating conditions, require that the fuel oil pressure, fuel oil temperature and quantity of oil supplied be watched closely. The flame appearance should be under close observation at all times in order to assure the proper atomization and burning of the fuel oil. It is important that the following be observed:

(*a*) To increase the oil pressure requires additional air pressure (because of the increase in the quantity of oil being burned).

(*b*) Always increase the air pressure before increasing the oil pressure.

(*c*) Always decrease the air pressure after decreasing the oil pressure.

(*d*) Select the proper size atomizer for the anticipated maximum load so that the necessary oil pressure falls within the range at which the burner is most efficient. (Minor variations in steam demand such as may be expected at sea should be met by varying the oil pressure. If the change in steady load is such that the oil pressure becomes either too high or too low for efficient atomization, then the size of the sprayer plates should be varied accordingly. Heavy changes in steam demand such as are met with when maneuvering in harbor or while working cargo should be met by cutting burners in or out. Be sure that each burner in use is fitted with the same size sprayer plate.)

(*e*) Ascertain best atomization temperature of fuel oil and always maintain such temperature. (Inasmuch as each type of fuel oil has a certain specific temperature (based on viscosity) at which atomization best takes place, it follows that this specific temperature should be ascertained, and when once known every effort should be made to maintain the oil at this point at all times.)

(*f*) Keep burners clean and properly adjusted.

(*g*) Watch the rate of evaporation in the boilers. (When maneuvering in and around harbors where only one boiler is in operation, extreme care should be exercised never to force a boiler to such an extent that the rate of evaporation is too high, as this procedure is apt to break up the circulation of water in the boiler and may cause sagging of the lower rows of tubes.)

Whenever it becomes necessary to secure all burners under a boiler, or should the burners be extinguished (ignition lost due to low oil pressure, water in the fuel oil, cold oil, etc.) the furnace and gas passage of the boiler unit must be thoroughly purged before an attempt is made to light a

burner again. This procedure must be followed even though the burners are extinguished for only a few minutes. In the case of ignition loss, all burners must be shut down and the valves leading to each individual burner should be immediately secured, then the purging operation started.

If a soot fire should occur, the first noticeable indications will be a sudden otherwise unexplainable increase in the uptake gas temperature, flames issuing from the stack, a roaring noise in the uptake, and overheating of the casing at uptake in the air heater or economizer zone. In the event of soot fires in the areas of air heaters or economizers, the operators should bear in mind the fact that one of the fundamental conditions necessary for any fire is sufficient oxygen to support and maintain combustion. In order to minimize the damage that may occur from a soot fire, the following action should be taken immediately:

(*a*) Secure all oil burners.

(*b*) Close air register doors to keep the air at a minimum.

(*c*) Remove atomizers.

(*d*) Secure fans.

(*e*) Block off air inlet to forced draft fan, if possible.

(*f*) Raise the water level in the steam drum to the top of the gauge glass.

(*g*) Increase the feed flow through the economizer to the maximum possible and keep water in sight in the gauge glass by use of the surface or bottom blow valve.

This procedure must be continued until the fire has been extinguished. To put out the fire it is suggested that the uptake access doors be opened sufficiently to allow CO_2 or other suitable fire extinguishers to be used to smother the flames. The use of soot blowers at this time may cause a serious explosion, as well as "fan" the fire and do more damage than good. See the picture on the back cover for damage to boiler as a result of a soot fire.

Under present trends of improvements, especially during the past 10 to 15 years, considerable development has taken place in the design of marine steam power plants, in order to realize the full advantage of economies that may be obtained from high pressure steam cycles. Air heaters and economizers are developments of this trend toward higher operating efficiency. In the shipbuilding program, the trend is characterized by the abandoning of the fire tube type of boilers and instead emphasizing the use of high pressures and temperatures, resuperheating, fewer boilers of greater steaming capacity, water-cooled furnaces, and the use of heat recovery equipment. These practices are all directed to the end of greater efficiency in steam generation and utilization, and the attainment of lower fuel consumption per shaft horsepower. With much of this complex machinery being placed in direct contact with the gas streams from the fuel burners in the boilers, the operating personnel have to be more vigilant than ever in keeping the fires burning efficiently under dock loading conditions.

APPENDIX

Amendments to Regulations

TITLE 33—NAVIGATION AND NAVIGABLE WATERS

Chapter I—Coast Guard, Department of the Treasury

PART 6—SECURITY OF PORTS AND THE CONTROL OF VESSELS IN THE NAVIGABLE WATERS OF THE UNITED STATES

SUBPART C—ANCHORAGE AND RESTRICTED AREAS

Pursuant to the authority contained in section 1, Title II, of the Espionage Act approved June 15, 1917, 40 Stat. 220 as amended by the Act of November 15, 1941, 55 Stat. 763 (50 U. S. C. 191, 191c), and by virtue of the Proclamation Number 2412 issued June 27, 1940 (5 F. R. 2419), the Regulations for the Security of Ports and Control of Vessels in the Navigable Waters of the United States are amended as follows:

First Naval District: Sections 6.1–140 and 6.1–132 are rescinded and § 6.1–130 substituted to read as follows:

§ 6.1–130 *Massachusetts — Cape Cod restricted area off Race Point and Peaked Hill Bar.* (a) Area A is bounded as follows: A line drawn from a point on the shore in position 42°03'06" N., 70°13'30" W., due west to 70°15'54" W., thence due north to 42°04'24" N., thence due east to the shoreline.

(b) Area B is bounded as follows: A line drawn from a point on the shore in 42°04'54" N., 70°11'00" W., due north to 42°06' N., thence due east to 70°08'00" W., thence south to the shoreline.

(c) *The regulations.* All vessels are warned not to enter the above areas. Vessels are warned that to pass through might cause loss of vessel and personnel. Small craft are allowed passageway inshore of the fifty (50) foot depth line around the tip of Race Point in the area formerly known as Area A. The enforcing officer shall be the Commandant, First Naval District, and such agencies as he may designate.

Seventh Naval District. A new § 6.7–4 is added to read as follows:

§ 6.7–4 *Live firing area for strafing, Key West, Florida*—(a) *The area.* The area is bounded on the north by latitude 24°51'08", on the south by latitude 24°48'52", on the east by longitude 81°13'52" and on the west by longitude 81°16'21". The hull of an ex-Naval Vessel (PE–19) is located in the center of the area and is used by U. S. Fleet Aircraft for live strafing.

(b) *The regulations.* The area is closed to all vessels at all times.

(c) *Enforcing officer.* These regulations shall be enforced by the Captain of the Port, Key West, Florida. (11 F. R. 5871–5872, 30 May 1946)

Chapter III—Coast Guard: Inspection and Navigation

AMENDMENTS TO PILOT RULES

PART 302—BOUNDARY LINES ON INLAND WATERS

ATLANTIC COAST

Section 302.30 *Chesapeake Bay and tributaries.* A line drawn from Cape Henry Lighthouse to Cape Henry Junction Lighted Whistle Buoy; thence to Cape Charles Lighthouse.

PART 322—PILOT RULES FOR THE GREAT LAKES

SIGNALS AND RULES OF THE ROAD

Section 322.2 is amended by changing the phrase "not less than four" to "not less than five" so that this section reads as follows:

§ 322.2 *Danger signal.* If, when steamers are approaching each other, the pilot of either vessel fails to understand the course or intention of the other, whether from signals being given or answered erroneously or from other causes, the pilot so in

doubt shall immediately signify the same by giving the danger signal of several short and rapid blasts of the whistle, not less than five; and if both vessels shall have approached within half a mile of each other, both shall be immediately slowed to a speed barely sufficient for steerageway, and, if necessary, stopped and reversed, until the proper signals are given, answered, and understood, or until the vessels shall have passed each other.

Section 322.8 is amended in the first undesignated paragraph by changing the phrase "not less than four" to "not less than five" so that this paragraph reads as follows:

§ 322.8 *Vessels running in same direction; signals for overtaking.* When steam vessels are running in the same direction, and the vessel which is astern shall desire to pass on the right or starboard hand of the vessel ahead, she shall give one short blast of the steam whistle, as a signal of such desire, and if the vessel ahead answers with one blast, she shall direct her course to starboard; or if she shall desire to pass on the left or portside of the vessel ahead, she shall give two short blasts of the steam whistle as a signal of such desire, and if the vessel ahead answers with two blasts, shall direct her course to port; or if the vessel ahead does not think it safe for the vessel astern to attempt to pass at that point, she shall immediately signify the same by giving several short and rapid blasts of the steam whistle, not less than five, and under no circumstances shall the vessel astern attempt to pass the vessel ahead until such time as they have reached a point where it can be safely done, when said vessel ahead shall signify her willingness by blowing the proper signals. The vessel ahead shall in no case attempt to cross the bow or crowd upon the course of the passing vessel. * * *

TITLE 46—SHIPPING

Chapter I—Coast Guard: Inspection and Navigation

All the changes in the regulations are now in effect. The exact effective date may be obtained from the Federal Register in which the amendment was published.

Subchapter D—Tank Vessels

PART 37—SPECIFICATIONS FOR LIFESAVING APPLIANCES

ELECTRIC WATER LIGHTS

Section 37.9-1 *Automatic electric water lights—TB/ALL* is amended in the second sentence by changing the date "July 1, 1946" to "January 1, 1947." (For text of regulation see Federal Register of August 23, 1945, 10 F.R. 10365, as amended October 2, 1945, and December 19, 1945.) (10 F.R. 12408, 15174–15175.)

Waiver

Appendix A—Waivers of Navigation and Vessel Inspection Laws and Regulations

EMPLOYMENT OF ALIENS AS UNLICENSED CREW MEMBERS; AMENDMENT

By virtue of the authority vested in me by section 501 of the act of March 27, 1942 (50 U.S.C. Appendix 635), Executive Order No. 9083, dated February 28, 1942 (3 CFR Cum. Supp.) as amended by Executive Order No. 9666, dated December 28, 1945 (11 F.R. 1), I hereby amend the order dated June 13, 1942 (7 F.R. 4515) to read as follows:

I hereby waive compliance with the provisions of section 5 (b) of the act of June 25, 1946, and sections 302 (a), (b) and (c) of the act of June 29, 1936 (46 U.S.C. 672a; 1132 (a), (b) and (c)), to the extent necessary to permit the employment of aliens in the unlicensed crew of subsidized or unsubsidized vessels of the United States in a percentage not to exceed fifty percentum of the entire unlicensed crew employed on any subsidized or unsubsidized vessel of the United States.

Dated: April 30, 1946. (11 F.R. 4868, 3 May 1946.)

Equipment Approved by the Commandant

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 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), 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	Pump rooms of tank vessels	
Automatic Switch Co., New York, N. Y.:					
Drawing No. BV14-641, revision 8/16/43, solenoid valve, Type WP-RSKSSO, 300 psi, 250 volts d. c.	x	x			6-7-46
Henschel Corp., Amesbury, Mass.:					
Engine order telegraphs, electric, 115 volts a. c., 60 cycles:					
Drawing No. 10-1081, alteration 2, transmitter—indicator, double, double face, 12", Types I and II, pedestal mounting	x	x	x		5-29-46
Drawing No. 10-1083, alteration 2, transmitter—indicator, single, double face, 12", Types I and II, pedestal mounting	x	x	x		5-29-46
Drawing No. 10-1084, alteration 3, transmitter—indicator, single face, 12", Types I and II, pedestal mounting	x	x	x		5-29-46
Drawing No. 10-1046, alteration 1, transmitter—indicator, 12", bulkhead mounting	x	x			5-29-46
Drawing No. 10-1047, alteration 2, transmitter—indicator, 12", bulkhead mounting	x	x			5-29-46
Drawing No. 10-1048, alteration 1, single indicator, 12", Type B, bulkhead mounting, Type P, panel mounting	x	x			5-29-46
Drawing No. 10-1049, alteration 1, single indicator, 16", bulkhead mounting	x	x			5-29-46
Drawing No. 10-1041, sheets 1 and 2, alteration 5, internal units for commercial electric telegraphs					5-29-46
Vibrating bells and buzzers, splashproof:					
Drawing No. 20-162, alteration 1, 3", 6", and 8" bells and buzzer, 115, 32, 20-24, 12, and 6 volts d. c., and 115 and 24 volts, 60 cycles, a. c.	x	x	x		5-29-46
Drawing No. 20-162-1, alteration 1, 3", 6", and 8" bells and buzzer for mounting on telegraphs, 115 volts, 60 cycles, a. c.	x	x	x		5-29-46
Drawing No. 20-162-2, alteration 1, 3", 6", and 8" bells for telephones	x	x	x		5-29-46
Drawing No. 20-163, alteration 1, 6", 8", 10", and 12" bells, 115, 24, 20, 12, and 6 volts d. c., and 115 volts, 60 cycles, a. c.	x	x	x		5-29-46
Drawing No. 20-163-1, alteration 1, 6", 8", 10," and 12" bells for mounting on telegraphs, 115 volts, 60 cycles a. c.	x	x	x		-29-4
Drawing No. 10-1094, alteration O, mechanical telegraph indicator, Type I, with reply, Type II, indicator only, 16"	x	x			5-29-46

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	
Lovell-Dressel Co., Inc., Arlington, N. J.:					
Switch and pilot light combinations, waterproof:					
Drawing No. 2794, alteration 1:					
Cat. No. 2794, pilot light and single-pole switch, 10A, 250V	x	x	x		6-13-46
Cat. No. 2793, pilot light and double-pole switch, 10A, 250V	x	x	x		6-13-46
Cat. No. 1751, single pilot light	x	x	x		6-13-46
Cat. No. 1752, double pilot light	x	x	x		6-13-46
Receptacle, single, waterproof, single phase, grounded, 10A, 125V, drawing No. 1801, alteration 1, cat. No. 1801	x	x	x		6-7-46
Receptacle, single, waterproof, 3-phase, grounded, 10A, 125V, drawing No. 1806, alteration 1, cat. No. 1806	x	x	x		6- 7-46
Receptacle, double, waterproof, single-phase, grounded, 10A, 125V, drawing No. 1836, alteration 1, cat. No. 1836	x	x	x		6- 7-46
Switch, single-pole, and double-receeptacle, single-phase, grounded, waterproof, 10A, 125V, drawing No. 2808, alteration 1, cat. No. 2808	x	x	x		6- 7-46
Single gang switches and receptacles, nonwatertight:					
Drawing No. M-5245, alteration O:					
Cat. No. 1601, single receptacle, 15A, 125V	x				5-23-46
Cat. No. 1618, single-pole switch, 10A, 125V	x				5-23-46
Cat. No. 1619, double-pole switch, 10A, 125V	x				5-23-46
Cat. No. 1621, 3-way switch, 10A, 125V	x				5-23-46
Cat. No. 1622, 4-way switch, 5A, 125V	x				5-23-46
Multiple switch and receptacle combinations, nonwatetight, drawing No. 5248, alteration O:					
Cat. No. 1605, 1 single-pole switch and 1 receptacle, 10A, 125V	x				5-23-46
Cat. No. 1606, 1 double-pole switch and receptacle, 10A, 125V	x				5-23-46
Cat. No. 1608, 1 single-pole switch and 2 receptacles, 10A, 125V	x				5-23-46
Cat. No. 1609, 1 double-pole switch and 2 receptacles, 10A, 125V	x				5-23-46
Cat. No. 1631, 2 single-pole switches, 10A, 125V	x				5-23-46
Cat. No. 1632, 2 double-pole switches, 10A, 125V	x				5-23-46
Cat. No. 1633, 2 3-way switches, 10A, 125V	x				5-23-46
Cat. No. 1634, 2 4-way switches, 5A, 125V	x				5-23-46
Cat. No. 1636, 2-gang receptacle, 15A, 125V	x				5-23-46
Cat. No. 1637, 3-gang receptacle, 15A, 125V	x				5-23-46
Cat. No. 1641, 3 single-pole switches, 10A, 125V	x				5-23-46
Cat. No. 1642, 3 double-pole switches, 10A, 125V	x				5-23-46
Cat. No. 1643, 3 3-way switches, 10A, 125V	x				5-23-46
Cat. No. 1644, 3 4-way switches, 5A, 125V	x				5-23-46
McNab of Bridgeport, Inc., Bridgeport, Conn.:					
Salinity indicator equipment:					
Drawing No. 11032-2, revision 1, assembly, Model MA6 indicator	x	x			5-24-46
Drawing No. 11034-2, revision 2, assembly, Model JMV indicator	x	x			5-24-46
Drawing No. 11035, revision 4, wiring diagram, Model JMV indicator	x	x			5-24, 46
Drawing No. 1028-2, revision 0, test cell and valve assembly	x	x			5-24-46
Drawing No. 11033-2, revision 1, wiring diagram, Model MA6 indicator	x	x			5-24-46
Sterling Bronze Co., Inc., Long Island City, N. Y.:					
Drawing No. 77499F, revision July 13, 1945, mirror light, nonwatertight, 8-watt fluorescent lamp, maximum	x				5-20-46
Drawing No. 77502B, revision July 6, 1945, berth light, nonwatertight, 40-watt lamp, maximum	x				5-20-46
Drawing No. 77504G, revision July 6, 1945, desk lamp, nonwatertight, 40-watt lamp, maximum	x				5-20-46
Drawing No. 77568, revision November 12, 1941, ceiling fixture, nonwatertight, 40-watt lamp, maximum	x				5-20-46

BUOYANT CUSHIONS FOR MOTORBOATS

Approval No. A–309, standard kapok buoyant cushion, for use on motorboats of classes A, 1, and 2 not carrying passengers for hire, manufactured by American Canvas Manufacturing Company, 804 East First Place, Tulsa 3, Oklahoma. (11 F. R. 6126, 5 June 1946.)

Approval No. B–304, 14" x 14" x 2" seat, 18 ounces kapok; and 14" x 14" x 2" back, 18 ounces kapok, double buoyant cushion, for use on motorboats of classes A, 1, and 2 not carrying passengers for hire, Dwg. No. 2026, dated 20 April 1946, manufactured by American Textile Equipment Corporation, 3 State Street, New York 4, New York.

Approval No. B–305, 20" x 23" x 2" buoyant cushion No. 29, 72 ounces kapok, for use on motorboats of classes A, 1, and 2 not carrying passengers for hire, Dwg. Nos. SK6728, revised 6 May 1946, and SK3681, dated 20 January 1942, manufactured by Chris-Craft Corporation, Algonac, Michigan.

Approval No. B–306, 24" x 27" x 2½" buoyant cushion No. 30, 88 ounces kapok, for use on motorboats of classes A, 1, and 2 not carrying passengers for hire, Dwg. Nos. SK6729, revised 6 May 1946, and SK3681, dated 20 January 1942, manufactured by Chris-Craft Corporation, Algonac, Michigan.

Approved No. B–307, 14" x 18" x 2" sectional buoyant cushion No. 1703, 20 ounces kapok, for use on motorboats of classes A, 1, and 2 not carrying passengers for hire, Dwg. No. 1–110, dated 12 March 1946, manufactured by Wilber & Son, 116 New Montgomery Street, San Francisco 5, California.

Approval No. A–308, standard kapok buoyant cushion, for use on motorboats of classes A, 1, and 2 not carrying passengers for hire, manufactured by American Textile Equipment Corporation, 3 State Street, New York 4, New York. (11 F. R. 6269–6270, 8 June 1946.)

FIRE EXTINGUISHER

Model 4T 4-pound carbon dioxide fire extinguisher, Assembly Dwg. No. M–890008, Rev. O, dated 8 April 1946, Nameplate Dwg. No. 67111, Rev. O, dated 10 December 1945, manufactured by Walter Kidde and Co., Inc., 675 Main Street, Belleville 9, N. J.

EMBARKATION-DEBARKATION LADDER

Type 8PL–A embarkation-debarkation ladder, chain suspension, aluminum ears, Dwg. dated 5 June 1946 and Specification, submitted by H. K. Metal Craft Manufacturing Co., 3775 Tenth Avenue at 203d Street, New York 34, N. Y.

LIFEBOATS

30' x 10.25' x 3.5' steel hand propelled lifeboat, 76-person capacity, General Arrangement Dwg. No. 1300, dated 18 April 1946, altered 2 May 1946, submitted by Welin Davit and Boat Division of the Robinson Foundation Inc., Perth Amboy, New Jersey. (This approval is limited to 10 lifeboats which are to be used as replacements only on the S. S. "Catalina," O. N. 223907.) (11 F. R. 6126, 5 June 1946.)

18' x 5.75' x 2.42' steel oar-propelled lifeboat, 15-person capacity, General Arrangement Dwg. No. 757–1, altered 6/27/44, submitted by Welin Davit & Boat Division of the Robinson Foundation, Perth Amboy, N. J.

WITHDRAWAL OF APPROVAL

BUOYANT CUSHION

Withdrawal of approval of buoyant cushion, Approval No. B–69 (Modified U. S. Gov't Vest, Universal Size) (Drawing dated 10–6–41), manufactured by the American Pad and Textile Co., Greenfield, Ohio. (Approved 19 November 1941, 6 F. R. 5881.)

Notwithstanding the withdrawal of approval of the above item of equipment, any carrying Approval No. B–69 may be used so long as in good and serviceable condition.

Merchant Marine Personnel Statistics

MERCHANT MARINE LICENSES ISSUED DURING MAY 1946

DECK OFFICERS

Region	Master										Chief mate										Second mate									
	Ocean		Coast-wise		Great Lakes		B. S. & L.		Rivers		Ocean		Coast-wise		Great Lakes		B. S. & L.		Rivers		Ocean		Coast-wise		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	68	76	5	11	...	4	12	54	...	6	94	17	1	2	...	...	1	8	...	1	106	14	1	...	...	...	...	...	...	...
Gulf coast	11	11	1	...	...	1	6	7	1	2	30	3	...	...	...	...	...	...	...	1	34	1	...	...	...	...	...	...	...	...
Great Lakes and rivers	...	1	...	...	7	24	...	1	4	14	1	2	...	...	...	...	...	...	6	12	1	...	...	...	...	...	...	...	...	...
Pacific coast	55	64	5	5	...	...	6	16	...	2	59	13	...	...	...	...	3	1	...	...	77	7	...	...	...	...	...	1	...	...
Total	134	152	11	16	7	29	24	78	5	24	184	35	1	2	...	...	4	9	6	14	218	22	1	...	...	...	...	1	...	...

Region	Third mate										Pilots						Master mate				Total		
	Ocean		Coast-wise		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	122	15	...	...	...	...	...	...	...	...	...	...	67	153	...	...	...	...	...	2	477	363	840
Gulf coast	26	2	...	...	...	...	...	...	...	...	...	...	39	22	...	...	...	...	...	...	148	50	198
Great Lakes and rivers	...	...	...	...	...	...	...	...	1	...	6	34	5	11	23	25	...	...	...	...	54	124	178
Pacific coast	123	1	...	...	...	...	...	...	...	...	...	...	38	63	...	...	...	7	10	...	376	180	556
Total	271	18	...	...	...	...	...	...	1	...	6	34	149	249	23	25	...	7	10	2	1,055	717	1,772

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	31	69	6	19	66	33	3	16	134	21	...	7	168	16	...	...
Gulf coast	26	31	1	6	21	12	1	4	23	4	...	...	25	6	...	...
Great Lakes and rivers	6	16	2	54	5	6	4	23	7	5	2	13	8	2	...	2
Pacific coast	61	83	...	8	73	21	...	1	68	12	...	...	75	4	1	...
Total	124	199	9	87	165	72	8	44	232	42	2	20	276	28	1	2

Region	Motor vessels								Uninspected vessels				Totals		
	Chief 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	41	11	9	12	2	96	5	...	1	...	2	555	241	796
Gulf coast	7	22	3	3	7	1	12	...	...	...	...	...	126	89	215
Great Lakes and rivers	10	18	8	10	4	5	6	2	...	...	...	...	62	156	218
Pacific coast	16	41	5	7	9	4	7	3	2	4	2	...	319	188	507
Total	61	122	27	29	32	12	121	10	2	5	2	2	1,062	674	1,736

ORIGINAL SEAMEN'S DOCUMENTS ISSUED, MONTH OF MAY 1946

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 [3]	Lifeboat, 12-24 months [4]	U. S. Mer. Mar. Doc.	Q. M. E. D., 6 months	Q. M. E. D., emergency	Radio operators	Certificate of service	Tanker man	Staff officer	Total
Atlantic coast	3	1	92	255	196	5	0	872	3,126	453	331	8	2,186	31	286	7,845
Gulf coast	260	0	10	116	13	0	0	338	1,055	235	281	4	1,130	11	47	3,500
Pacific coast	6	261	35	119	105	0	0	475	1,115	267	215	9	1,096	5	136	3,844
Great Lakes and rivers	119	0	22	14	75	16	0	94	1,087	114	45	0	1,098	11	6	2,701
Total	388	262	159	504	389	21	0	1,779	6,383	1,069	872	21	5,510	58	475	17,890

[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.

NOTE.—There were 10 Panamanian Employment Cards issued.

CREW SHORTAGE REPORTS FROM 1 MAY TO 31 MAY 1946

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	24	.....	5	2	.....	15	13	.....	1	1	4	17	5	63
Gulf coast	32	4	6	8	1	15	7	.....	.....	3	6	22	7	79
Pacific coast	8	.....	.....	.....	.....	4	.....	.....	.....	1	2	1	1	9
Great Lakes	35	.....	.....	2	.....	25	7	.....	.....	.....	7	18	9	68
Total	99	4	11	12	1	59	27	.....	1	5	19	58	22	219

WAIVERS OF MANNING REQUIREMENTS FROM 1 MAY TO 31 MAY 1946

Authority for These Waivers Contained in Navigation and Vessel Inspection Circular No. 31, Dated 13 March 1943 and Navigation and Vessel Inspection Circular No. 37, Dated 6 July 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	599	139	275	26	1,188	81	210	28	26	1,973
Gulf coast	281	111	154	30	669	70	157	8	17	1,216
Pacific coast	175	25	72	11	335	58	113	3	13	630
Great Lakes	31	.....	.....	.....	46	10	.....	.....	.....	56
Total	1,086	275	501	67	2,238	219	480	39	56	3,875

Boiler damaged by a soot fire. See page 106 for article on soot fires.

U. S. GOVERNMENT PRINTING OFFICE: 1944