PROCEEDINGS
OF THE MERCHANT MARINE COUNCIL

UNITED STATES COAST GUARD
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Bridge-to-Bridge VHF radio comes in for some telling analysis and review in four separate articles.

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The series of articles comparing the 1960 and 1948 Rules of the Road is continued beginning page 92.

ESSO FUEL OIL, Humble Oil & Refining Co.'s new self-propelled barge.

THIS COPY FOR NOT LESS THAN 20 READERS—PASS IT ALONG

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COVERS

FRONT: Vessel bound for Port Newark in direct "Bridge-to-Bridge" voice communication with RR drawbridge. *Courtesy Port of New York Authority.*

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PROCEEDINGS

OF THE

MERCHANT MARINE COUNCIL

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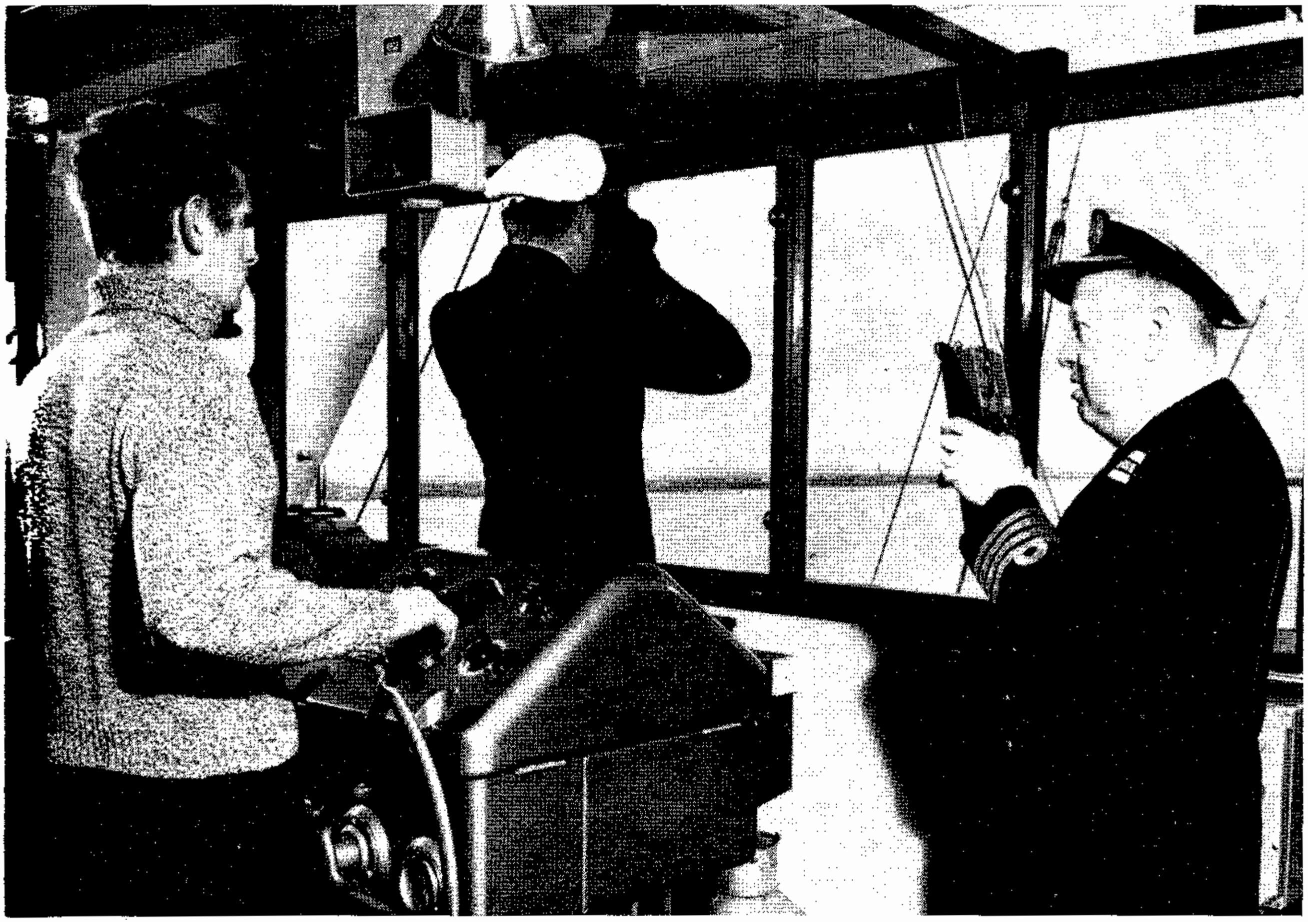


Port Newark pilot allows foreign master to "talk" to approaching vessel on portable radio.

Anti-Collision Measures Promoted By Coast Guard

A Survey

By

CAPT Wm. C. Foster, USCG

Four antiship collision programs, in which the Coast Guard is deeply involved, were discussed at the Fall meeting of the American Pilots Association by Capt. William C. Foster, USCG, Chief, Merchant Vessel Inspection Division.

To keynote a series of articles treating these programs, Captain Foster has adapted his Fall address for the Proceedings. His comments are noteworthy and reflective.

Captain Foster is a 1940 graduate of the U.S. Coast Guard Academy. He saw World War II service on the cutters Champlain and Spencer, and the attack transport Joseph Dickman (ex President Roosevelt). He served as executive officer on the cutter Androscoggin and the icebreaker Northwind *and as commanding officer of the icebreaker* Storis. *His experience in merchant marine safety is extensive, having served progressively in positions in that field at Baltimore, Seattle and Cleveland, at the latter as Officer in Charge, Marine Inspection. He assumed his present headquarters position in 1963.*

THE COAST GUARD is deeply interested in the research and development of proposals in four related, but individually unique antiship collision programs, that, if adopted, would figure mightily in the lessening of collision frequency. These programs include the Coast Guard proposal for a unified United States Rules of the Road, Bridge-to-Bridge VHF Radiotelephone Communications, Harbor Advisory Radar and Shipping Traffic Lanes.

UNIFICATION OF RULES OF THE ROAD

The Coast Guard has proposed to unify the Inland, Western Rivers and Great Lakes Rules of the Road into a single system as nearly identical to the new 1960 International Rules of the Road as is feasible.[1] The proposed rules are the result of Coast Guard studies and those of a Rules of the Road Committee of the Western Rivers Panel to the U.S. Coast Guard Merchant Marine Council. This spe-

[1] See Proceedings, November 1964, January 1956.

cial committee, which included pilots and shipmasters from the Gulf and Western Rivers area has greatly assisted the Coast Guard in this endeavor.

The proposed U.S. rules are tentative and will be subject to revision after comments are received from the several thousand copies mailed to Pilots' Associations, to shipping companies, marine oriented organizations and to other interested parties. The proposed rules are presented in a comparative form wherein the present Inland, Western Rivers, Great Lakes and the new 1960 International Rules are printed side by side for review. After comments are studied, the proposed rules will be revised as appropriate and then presented to the Rules of the Road Coordinating Panel of the Merchant Marine Council. This panel consists of representatives of the American Pilots' Association, American Waterways Operators, Lake Carriers' Association and additional representatives of the shipping and boating fraternity.

After review by the panel and consideration of any recommendations, the proposed U.S. rules will be presented to Congress in the form of recommended legislation. This may appear to be a laborious and time-consuming process, and it is, but, in this manner the Coast Guard can arrive at a single set of rules incorporating the thoughts and opinions of all those who will have to use and be governed by such rules. We hope to present the U.S. rules to Congress sometime during 1966.

The preliminary Coast Guard proposal for Rules of the Road that would apply to all navigable waters of the United States within the International-Inland Demarcation Line does not differ radically from the present Inland Rules. In fact, from an operational standpoint, the changes that would affect Pilots of power-driven vessels are very minor.

For example: The proposal calls for the elimination of a 4 or more blast danger signal, and provides a 5 or more blast signal in its place. The signal consisting of 4 short blasts is an optional signal which may be sounded by pilot vessels in fog as an identity signal. This is a new provision in the 1960 International Rules.

The signal for vessels over 350 feet in length anchored in fog would include not only the ringing of the bell for 5 seconds found in the present Inland Rules, but would require this to be sounded in the forepart of the vessel and would require the sounding of a gong in the after part for the same length of time. The gong requirement is in the present International Rules.

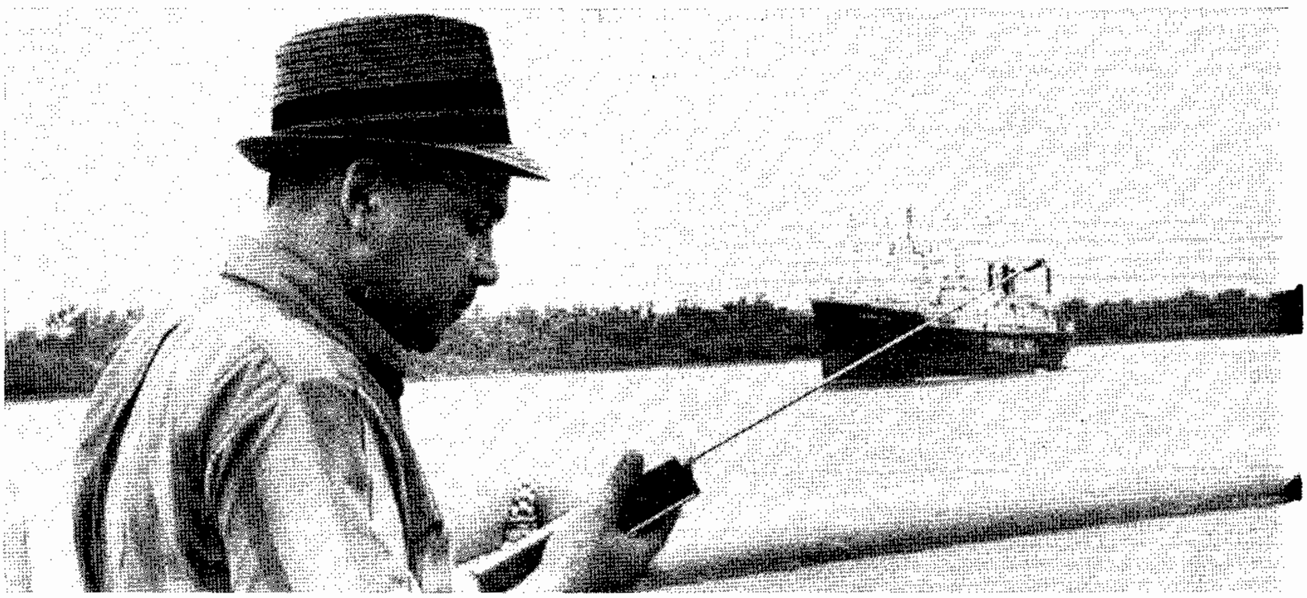
The fog signal of a prolonged and two short blasts for vessels towing is retained. The proposal also applies this signal to fishing vessels. A new optional signal for vessels towed, which is a prolonged and three short blasts, has been added to make it identical to International Rules.

A new fog signal for vessels aground has also been added. It consists of the fog signal for vessels at anchor with the addition of three separate strokes on the bell before the rapid ringing, and three strokes after the rapid ringing, or, in the case of vessels over 350 feet, after the sounding of the gong. This is in present International Rules.

All of the foregoing changes to the signals sounded by vessels in fog will make the Inland Rules follow the operational aspects of the International Rules more closely and should be familiar to all oceangoing vessel deck officers.

Rule 16, Speed in Fog, does not change in any great degree. However, the proposal incorporates the new provision of the 1960 International Rules encouraging vessels detecting others on radar and not visually, to take early and substantial action to avoid a close quarters situation. This addition to the rule has been given much fanfare because it provides for the use of radar. However, it is *permissive,* and merely encourages radar-equipped vessels to do what common sense dictates should be done during periods of reduced visibility.

The rule giving sailing craft the right of way over other vessels, Rule 20, has been modified so that these craft do not unnecessarily assert this right over large vessels in narrow channels. The rule is further modified by the inclusion of a restriction on seaplanes, which is in the International Rules, and by a similar restriction on nondisplacement high-speed craft. This latter provision is designed to keep hydrofoil craft and ground effects machines well clear



New Orleans pilot discusses passing intentions with pilot on vessel in background.

all other vessels while actually operating at high speeds: It should be noted that the latter category are now constructed for speeds up to 70 knots, but it is projected that speeds up to 120 knots are feasible.

The narrow channel rule of the proposal, Rule 25, contains the bend signal of the corresponding International Rule, in lieu of leaving it in the present Inland Article 18. This part of the Inland Rules now covers items spread out among Rules 18, 24, 25, and 28 of the International Rules. The proposed narrow channel rule also contains a provision prohibiting small craft from hampering large vessels and tows in narrow channels. It should be noted that this provision and its counterpart applicable to sailing vessels are included in similar form in the International Rules that will become effective next September. Also, a bill to incorporate them into the existing three sets of the U.S. Rules of the Road has been transmitted to the House of Representatives.

It is easily seen that these changes to the steering and sailing rules are not at all radical. The remaining operational rule of the proposal, the rule for whistle signals between power-driven vessels, also contains slight departures from the present inland requirements. The changes in form, which call for the removal of whistle signals from the steering and sailing rules, seem radical at first glance: but the only substantial changes from the present Inland Rules are limited to deletion of the "full speed" concept applied to the whistle signal for vessels whose engines are going astern, the addition of a whistle light, and an exemption from these whistle signal requirements for vessels less than 26 feet in length. The first change would make Inland Rules follow International Rules, and follow many interpretations of the "full speed" concept. The second change, the whistle light addition, merely states the international provision; this could either be optional or mandatory, depending upon the reaction of all maritime interests. The last change, which follows the Canadian law for motorboats, acknowledges the existing practice among small, high-powered boats which make enough noise to prevent their own and other boats' whistles from being heard.

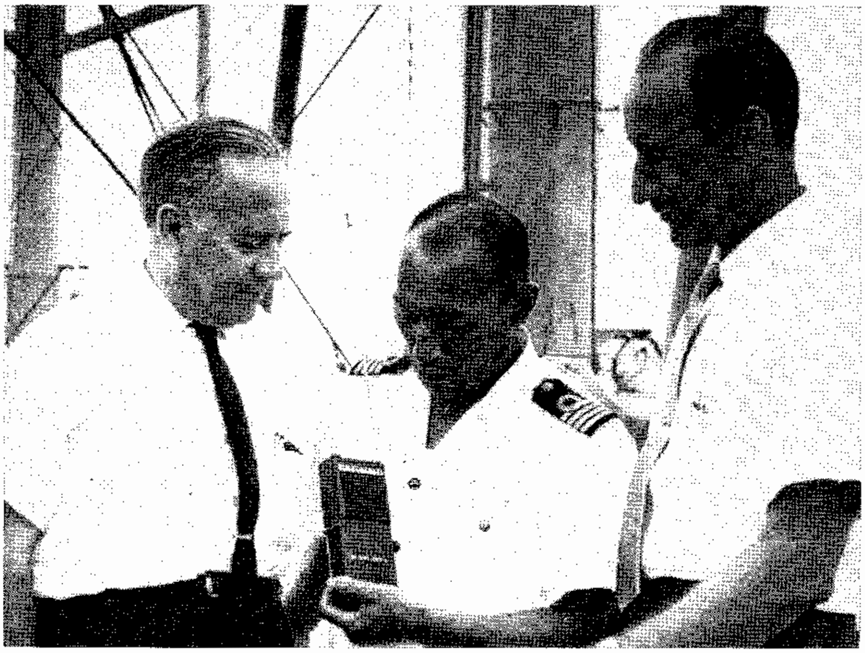
The area of whistle signals is the only one in which the proposal makes substantial change from the new international rules. While it is not impossible for this country to utilize the rudder signals of international waters and to superimpose intent signals upon them, it has not been heretofore felt that such a great departure from the system now used in Inland, Great Lakes and Western Rivers areas is either necessary or justifiable.

Although the proposal does not differ greatly in concept from the Inland Rules, it does differ from the Great Lakes and Western Rivers Rules requirements for whistle signals. The biggest departure concerns signals in fog. Both of those areas utilize the three-blast fog signal and sound passing signals when not in sight of one another. Operators in the Great Lakes oppose our proposal incorporating this change in the whistle signal requirement, while those in the Western Rivers area favor it. This matter appears to be the biggest stumbling block that has confronted our unification proposal.

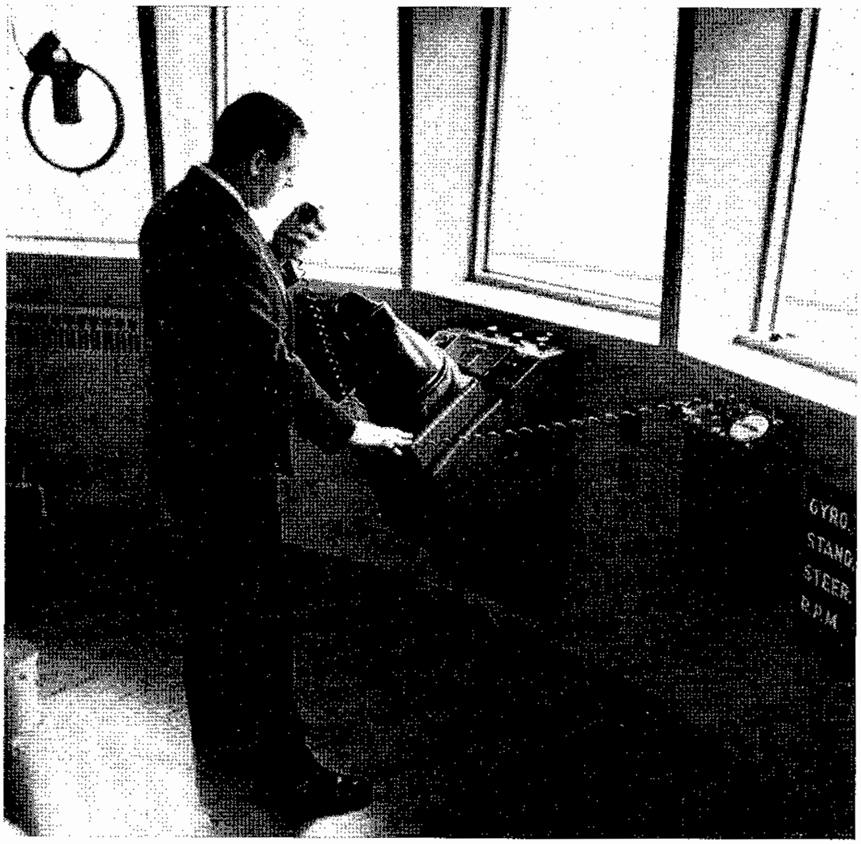
Rule 8, the rule for pilot vessels, is important enough to review in detail. The proposal for this rule follows International Rule 8 verbatim. It would require the all around masthead light to be visible a distance of 3 miles and be placed 20 feet above the hull on vessels 65 feet or more in length. On smaller vessels this height would be reduced to 9 feet. It would eliminate any reference to pilot vessels by "class obliged to go alongside of a vessel to put a pilot on board," and base the sidelight relaxation upon "bad weather or other sufficient cause." The flareup light of the proposal is to be shown at intervals not exceeding 10 minutes in lieu of the present 15-minute requirement. And finally, the proposal would require sidelights to be shown continuously by all power-driven pilot vessels engaged on pilotage duty in inland waters except when at anchor.

UNIFICATION JUSTIFICATION

Now that changes to the rules have been proposed, some justification for the concept of unified rules should be expressed. Our Great Lakes and Western Rivers Rules were applicable originally to areas that did not see any significant ocean traffic. Now there is a considerable amount of oceangoing vessel traffic to Baton Rouge and to the Great Lakes. Although pilots navigate all vessels, the masters are still responsible to their respective operators for their vessels' safety; or, in the case of U.S. flag vessels on coastwise voyages, the pilots may be regular ships' officers who must operate under International Rules during most of their watches. Unification of the U.S. Rules of the Road is intended to make the rules in all areas as close to the International Rules as practicable and to make all parts of the United States subject to the same operational rules. Such a change will reduce the volume of rules that mariners must know, and will facilitate a better understanding of them. This should result in more consistent compliance, hence safer operations.



Portable radio is demonstrated to Japanese master by New Orleans Steamship Association Executive and Crescent River pilot.



A Sun Oil master confers with approaching vessel using a fixed VHF unit typical of those found on Delaware River—frequenting—tankships.

BRIDGE-TO-BRIDGE COMMUNICATIONS

A second subject in which the Coast Guard has a vital interest is bridge-to-bridge VHF radiotelephone between ships for safety of navigation. This is also felt to include communications between ships and bridges crossing waterways, canal lock entrances and similar locations. A joint committee comprised of Coast Guard and Federal Communications Commission personnel has studied this subject for some time and has submitted its proposals to the Commandant of the Coast Guard and to the Federal Communications Commissioners. These proposals have also been discussed with several shipping groups and with representatives of radio officers unions. An excellent and informative talk was given in Boston before the RTCM[2] meeting by Captain Paul Ives of the Delaware Pilots' Association, based on the use of radio telephones with radar by pilots on the Delaware during the last 5 years.

[2] Radio Technical Commission for Marine Services (RTCM).

COAST GUARD RECOMMENDATIONS

The system that the Coast Guard-Federal Communications Commission Committee recommends for use on United States Inland Waters is quite similar to the one that is used on the Delaware river. Tentative conclusions to date are as follows:

a. Compulsory VHF bridge-to-bridge radio telephone equipment should be required on the bridge on the following vessels in all U.S. inland waters except the Great Lakes:

(1) All power-driven vessels of 300 or more gross tons.

(2) Towing vessels of 26 feet or more in length.

(3) All passenger vessels of 100 gross tons or over.

b. All United States and foreign vessels while operating on U.S. inland waters would be required to be capable of transmitting on a single frequency in the VHF band and continuous listening would be required on such vessels.

c. The frequency which would be selected would probably be 156.65 or the frequency which will cause the least amount of change of Maritime Mobile Services.

d. The requirement for transmitting and listening on the single frequency which would be used in the "party line concept" would permit the use of portable radio telephone sets on such a frequency.

e. Exemption authority should be included in any proposed legislation in order to authorize the administering agency to exempt where the requirement is considered to be unnecessary.

f. The designated inland frequency is to be used solely for the purpose of safety in navigation of vessels and other usage will not be permitted.

g. Penalty provisions should be included in the law.

It is of note that above mentioned vessels of all flags and including Navy, Coast Guard, and Corps of Engineers' vessels would be required to have the capacity of transmitting and receiving and to stand continuous watch on the designated frequency. Under the "safety of navigation" concept it is expected that communications with bridges and canal locks and other manned navigational hazards would be permitted.

It is noted that the Great Lakes area would not be included. The exemption is made because there is an excellent system in use today on the Great Lakes in accordance with an agreement with the Canadian Government wherein all vessels must have radiotelephone equipment while on the Great Lakes. Vessels which do not have equipment receive a set when entering the lakes and return it when departing the seaway.

The Coast Guard-FCC Committee will prepare proposed legislation and appropriate proposed regulations. The two will be combined in a package that will be mailed to all interested organizations and groups for comments. After a reasonable period for receipt of comments, the proposals will be revised as indicated and then proposed legislation will be presented to Congress. After such a law is passed and the system is in operation, action will be recommended through IMCO on the international level in an attempt to arrive at a system in international waters which will offer the same advantages as the proposed system for U.S. inland waters.

USAGE ON INTERNATIONAL WATERS

There are a number of problems which are expected whenever an attempt is made to expand the system to international waters. Foremost among such problems is the fact that most foreign countries prefer and have equipped their vessels with multichannel equipment generally providing VHF communications on 26 to 52 channels. Some U.S. vessels have similar installations, particularly when they are on the northern European run where it is necessary in many ports to have a number of channels. Without this capacity it is understood that the pilots will not take the vessel up the rivers under conditions of poor visibility. There is also the possibility that in the future it may be necessary to have more than one frequency in U.S. inland waters. This may be required because of saturation due to volume of traffic and frequencies required for use with harbor radar advisory stations.

The present system which has been agreed to by several countries for use on a voluntary basis in international waters is a multichannel system. There is no specific frequency limited to safety of navigation purposes at present in international waters, rather a calling and shifting procedure would be used.

The Coast Guard-Federal Communications Commission Committee has scheduled additional meetings with the American Merchant Marine Institute and intends also to meet with West Coast Maritime Industry representatives.

The Coast Guard solicits comment upon these proposals, and following the same process used for Rules of the Road revision, will present a proposal to Congress incorporating the best professional thinking. Implementations of these proposals will permit the navigator to easily obtain the intentions of the pilots aboard approaching vessels and avoid those life shortening moments of doubt and misunderstanding which have led to so many disastrous collisions and also to near misses that pilots, shipmasters and commanding officers suffer from without VHF communications with other vessels. On the lighter side it is fortunate that we are living in a more reasonable and humane age than existed in England in the 14th century. Under the customs of the time as mentioned in an ancient document entitled "The Black Book of the Admiralty" it was the maritime law of England that the master was permitted to take the following action when a ship was lost because of the fault of a pilot. "It is established as a custom of the sea that if a ship is lost by default of the Lodeman (Pilot) the mariners may if they please bring the Lodeman to the Windlass or any other place and cut off his head without the mariners being bound to answer before any Judge because the Lodeman (Pilot) has committed high treasons against his undertaking of the pilotage. And this is the judgment." We are very

New Orleans-Baton Rouge pilot boards vessel with portable radio.

thankful that that procedure is no longer in vogue.

HARBOR ADVISORY RADAR

The Commandant has directed that a preliminary study be made of several U.S. sea ports to determine if harbor advisory radar would serve a useful purpose and appears to be necessary for safer navigation in those areas. After preliminary surveys, recommendations will be made to the Commandant as to whether detailed feasibility studies should be made of

CAPTAIN WILLIAM FOSTER

those ports. Preliminary studies have already been made for the ports of San Francisco, Los Angeles-Long Beach, and San Diego earlier this fall. It is anticipated that similar visits and observations will be made to several East Coast and Gulf ports in the near future. There are many problems involved such as: Who will operate the system? Who will pay for it? And will it have the confidence of pilots, masters, and shipowners, among others?

There are sophisticated systems in use today in the approaches to the ports of Rotterdam, Southampton and other foreign ports. The systems in Long Beach and Los Angeles which have been run by the appropriate pilots associations for some years with much success are not as complete and involved as those overseas. However, there is one similar characteristic in all existing systems and that is that they are purely advisory, and do not control the navigation of vessels. Should the Coast Guard actively participate in harbor advisory radar systems, it is envisioned that there would be no change from the present advisory concept wherein the master and the pilot may accept or reject the information and advice as they see fit. Obviously, an indispensable part of such harbor radar advisory systems is VHF radiotelephone communications.

SHIPPING TRAFFIC LANES

It is apparent that there may be a need for separate track lanes in many coastal and port areas of the United States. A good example of the effectiveness of separate traffic lanes for vessels proceeding basically in opposite directions is the system that has been used on the Great Lakes for over 50 years. Separate track lines are marked on the lake survey charts and are followed by all shipping insofar as is possible. The use of these lanes is believed to be a factor in reducing the collision rate to a very low figure compared to similar traffic areas in other parts of the country.

Studies will be made of coastwise, inland and congested locations such as the approaches to large seaports and entrances from sea in order to ascertain if the installation of separate track lanes would benefit shipping. The Coast Guard intends to consult with pilots' associations and other interested parties in each area investigated in order to obtain professional advice.

In summary, the Coast Guard is looking toward the future in many areas in an attempt to provide better aids to navigation and rules of navigation. ⚓

SINGLE CHANNEL BRIDGE TO BRIDGE RADIO

An Update

By
Harry G. Schad

BRIDGE-TO-BRIDGE voice communications between pilots navigating vessels in congested waters has become a navigational safety concept of healthy proliferation.

The following updated survey has been prepared especially for the Proceedings *by a traffic management expert most eminently qualified in the field. His comments and opinions are his own and do not necessarily represent those of the Coast Guard, though, as mentioned in the preceding article, the Coast Guard harbors a deep and abiding interest in this antiship collision program. In fact, to this end, the Coast Guard is presently engaged with the FCC in an effort to determine what steps should be taken in the best interests of safety.*

MR. HARRY G. SCHAD

THE SINGLE-CHANNEL bridge-to-bridge radiotelephone has been the subject of much enthusiastic discussion in marine circles over the past several years. Invariably, the discussions fall into two general categories. One group classifies the bridge-to-bridge radiotelephone as a convenience—an instrument for general communications, including navigational communications. Ship agents and those concerned with ship arrivals, departures, and servicing usually tend to be proponents of this concept, which is one of expediency. The other and larger group classifies the bridge-to-bridge radiotelephone as a vital safety measure—purely a navigational instrument, restricted to the exchange of navigational information. Shipowners, navigators, those concerned primarily with ship handling, and insurance underwriters usually comprise this group, pointing out that safety of navigation is a full-time consideration and should never be subordinate to general business communications, which can and should be handled separately.

SYSTEM SPREADS

The Joint Executive Committee, for implementation of its pioneering program in the Delaware River, utilized 156.65 mc. At the request of the full-time safety proponents, the Federal Communications Commission designated radio frequency 156.65 mc. for single-channel operation and restricted its use to the exchange of navigational information. From the start of the project, shipowners and navigators have been impressed greatly with the simplicity and smooth functioning of the Delaware River system; and, as a result of their enthusiasm, many other areas now are employing the 156.65 mc. concept with equally gratifying results. These areas include the Cape Cod Canal, the Hudson River, the Port Newark Area of New York Harbor, the Chesapeake and Delaware Canal, and the Mississippi River, including the Baton Rouge-New Orleans area and the Port of Houston. Firm commitments have been made in Mobile. It is expected, on good authority, that Lake Charles, the Sabine waterway, and the Aransas-Corpus Christi area soon will adopt similar programs. Towboat and barge operators, members of the American Waterway Operators, Inc., have been employing 156.65 mc. with excellent results on the Mississippi River.

Mr. Schad is Vice President and General Manager of Transportation, The Atlantic Refining Company, Philadelphia, Pa. He is Chairman of the Joint Executive Committee for the Improvement and Development of the Philadelphia Port Area, a member of the Board of Directors and Chairman of the Policy Committee on Waterway Improvements of the American Merchant Marine Institute, a Director of the Philadelphia Maritime Exchange and on the Board of Managers of American Bureau of Shipping.

The American Association of Port Authorities, during its annual convention in October 1964, adopted the following resolution:

> Now, therefore, be it *Resolved*, That the American Association of Port Authorities commends to the attention of all its port members, shipowners and other interested persons the Delaware River ship-to-ship radio communication system as an aid to navigation, and further urges particular scrutiny of this system by other ports, shipowners and other interested persons.

The American Pilots' Association, during its annual meeting in November 1964, adopted the following resolution:

> The American Pilots' Association has resolved to support a uniform system of bridge-to-bridge radio communication solely as an aid to navigation, and for this purpose it has appointed a special committee to prepare recommendations.

DELAWARE RIVER SYSTEM

By way of review, in the Delaware River system, major shipowners, tugboat and barge operators, drawbridges, dredging equipment, and the local Pilots' Association are equipped with bridge-to-bridge radiotelephones all operating on 156.65 mc. continuously monitored and instantly available. The key point in the Delaware River system is that safety of navigation is treated as a singular and lone objective, uncomplicated and unhampered by business oriented communication services.

Communications on 156.65 mc. are limited to a range of approximately ten miles (by technical design of the equipment) so that only those vessels in the immediate area are within range. When the necessity for using this equipment arises, all communications take place on one channel on a "party line" basis so that all vessels within the immediate area benefit by the information. An additional advantage of this mode of operation is that since all communications are on a single channel, operation of the equipment is extremely simple, reliability is increased, and cost is held to a minimum.

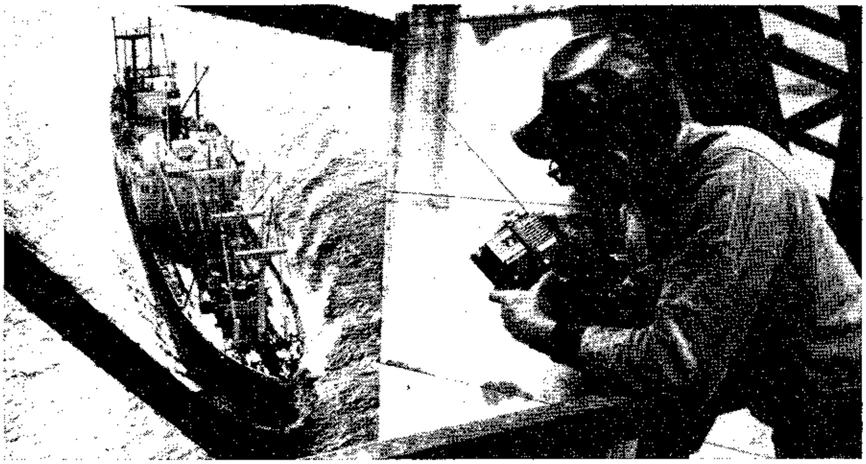
SINGLE CHANNEL

Communications are limited strictly to exchanges of navigational information. Specific examples are to obtain weather conditions affecting navigation in the area; to exchange verbal confirmation of passing information or intentions, including radar information; to ascertain existing conditions in anchorages or to notify others of anchored position in the channel, particularly during periods of poor visibility; to exchange information relative to passage through bridges.

Obviously, the single-channel radio system could never substitute for the broader purposes of a multi-channel system, and it is not meant to do so. The multi-channel radio concept, used in many foreign ports, is intended to provide a communications system to serve all short-range requirements, including harbor control, radar guidance, public correspondence, ship-to-shore messages, intership communications, etc. However, these diverse requirements which are placed on the multi-channel radio system negate its suitability for the specific and sole purpose for which the single-channel bridge-to-bridge system is intended—and that, of course, is a continuous and direct line of communication between the navigators of ships in the immediate vicinity.

Even though experience has proved the merits of the 156.65 mc. full-time safety concept, there is real danger that full future development of the 156.65 mc. bridge-to-bridge radiotelephone will lose its potential universal effectiveness. Some ports along the Atlantic, Gulf, and Pacific coasts are employing and proposing to employ frequencies which permit communications unrelated to safe navigation, thus placing navigation in a subordinate position and destroying the purity of the system's contribution to safety of navigation. This is, of course, contrary to the basic safety principle on which the bridge-to-bridge radiotelephone as a navigational instrument was conceived and developed. It is not a communications instrument in the usual sense of the word. It is more analogous to the ship's compass, the whistle, and the radar. We would not use the vessel's radar screen, for example, to view entertainment TV programs. Similarly, we should not use the bridge-to-bridge radiotelephone to relay personal and business messages which can and should be relayed by the ship's normal communications equipment.

For example, a major port is implementing a single-channel port communications system employing 156.9 mc. which includes, in addition to navigational exchanges, the reporting of ship arrivals and the myriad communications involving the business and operational needs of commercial vessels. There are other ports which utilize 156.35 mc., some use the citizens' band, the use of 156.60 mc. is permissible, as is 156.95 mc. There are interests such as some steamship agents, tugboat companies, and others who are concerned with ship arrivals, departures, and servicing and who are strongly inclined to look upon the bridge-to-bridge radiotelephone as at sea. (Many shipowners now are waiting for further developments and clarification of the present apparent lack of standardization. It is interesting, however, to note that many foreign vessels coming into the Delaware River have seen fit to equip with 156.65 mc. to enable them to fit into the system being used here.) The navigator, regardless of geography, would have one standard, reliable frequency for navigation—continuously monitored—instantly available and with all the inherent benefits of a party line in his immediate area.



Bridge tender on RR drawbridge over Newark Bay uses radio telephone to communicate with ship approaching draw bridge.

mainly a simple and convenient instrument for business communication, with its navigational safety feature as a recognized but somewhat incidental or simply emergency function. The 156.65 mc. concept anticipates the *avoidance* of emergencies by virtue of its single purpose.

NATIONWIDE STANDARD

It is becoming increasingly apparent to us that Coast Guard intervention is necessary to prevent a port-by-port "hodgepodge" situation and to further the true and singular application of the bridge-to-bridge radiotelephone as a "pure" aid to safety of navigation in ports around the nation. The United States Coast Guard could declare 156.65 mc., continuously monitored and with present FCC restrictions, a requirement for pilotage of commercial shipping in inland and restricted waters.

This step would standardize the navigator's bridge-to-bridge radiotelephone as an instrument of navigation and safety. Shipowners would be encouraged to make permanent installations on 156.65 mc., which installations would serve to enlarge the area of potential usefulness to include improved safety of navigation while

During the June, 1964, London meeting of the International Chamber of Shipping, foreign shipowners voiced strong objections to charges assessed against their ships for the use of portable radios on frequencies other than 156.65 mc. where employed by American pilots in some U.S. ports. Their objection stems from the fact that their ships already are equipped with the navigation frequency, 156.65 mc. (channel 13), but they are not equipped with the several different channels used in certain ports in the United States.

It should be noted here that 156.65 mc. is within the framework of the 1959 Geneva radio regulations. It is in accord with a key recommendation made by a committee of the House Merchant Marine and Fisheries Committee (following the *"Stockholm"/"Andrea Doria"* collision) that bridge-to-bridge direct radiotelephone communication should be included in any program for a long-range study of safety of life at sea. It has been endorsed by a special committee of the Secretary of the Treasury (such committee created on the recommendation of the Commandant of the U.S. Coast Guard following the *"Elna"/"Mission San Francisco"* collision).

(*Continued on Page 86*)

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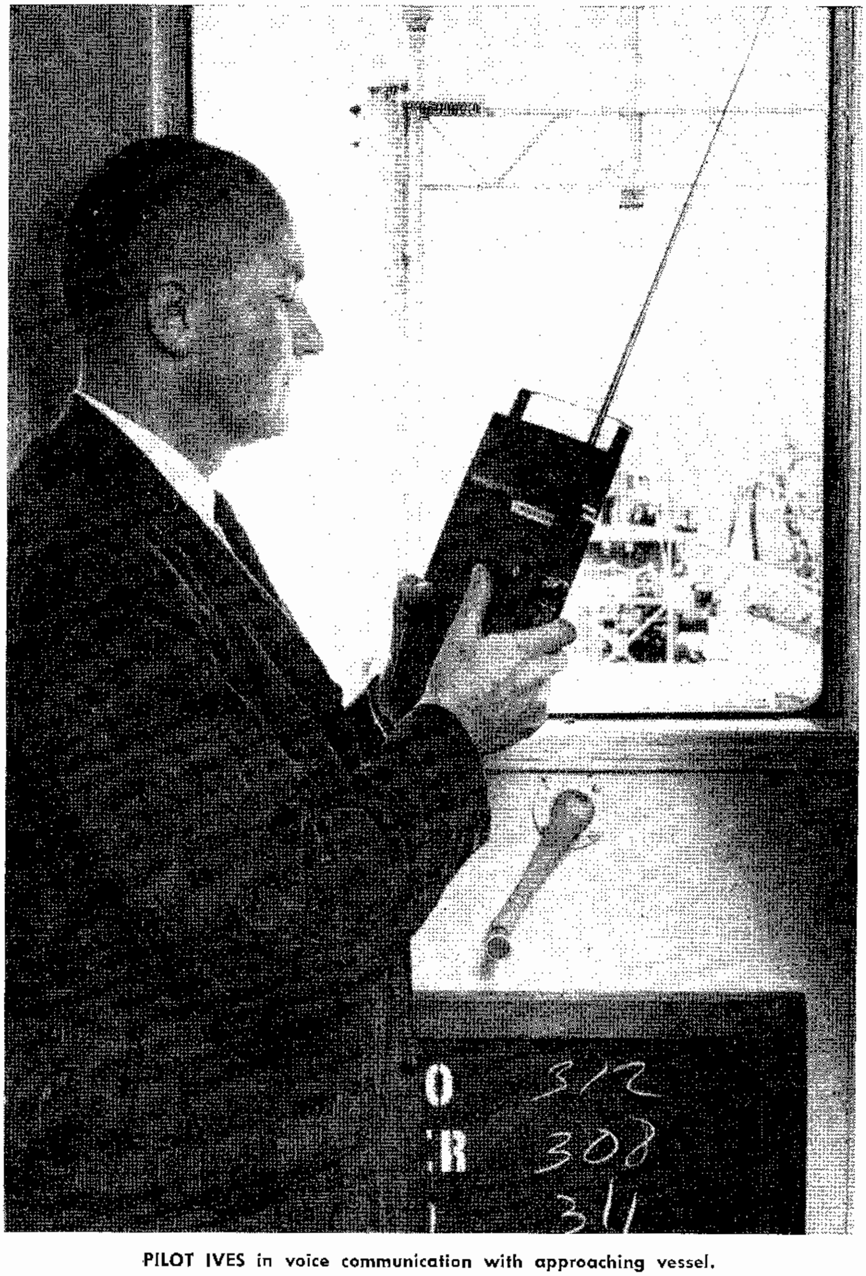
BRIDGE-TO-BRIDGE VHF RADIO ADDS "AUDIO FACULTY" TO RADAR

By CAPT Paul L. Ives, Jr.



PILOT IVES in voice communication with approaching vessel.

AT THE SPRING 1964 meeting of the Radio Technical Committee for Marine Service (RTCM), Captain Paul Ives, Philadelphia pilot, made several notable proposals for improving the value of shipboard radar by adding a VHF radio feature.

The author has kindly permitted the Proceedings *to reprint an adaptation of that Spring address. His approach is interesting; his proposal for the RADAR-RADIO marriage is novel. The Coast Guard, keenly appreciating fresh ideas enhancing marine safety, warmly welcomes Captain Ives' comments, even though the views are the author's and may not necessarily represent those of the Coast Guard.*

Captain Ives is a member of the Pilots Association for the Bay and River Delaware. He is a graduate of Johns Hopkins University, an active radio amateur holding a first class FCC license with ship radar endorsement, and a former instructor in Radar and Electronics Countermeasures with the U.S. Army Signal Corps.

A BRAND NEW CONCEPT of single-channel VHF bridge-to-bridge radiotelephony was inaugurated on the Delaware River in 1958. In May of that year, the early stages of bridge-to-bridge radiotelephony in the port of Philadelphia was demonstrated to the R.T.C.M. From these meager beginnings, the application of this phase of electronic technology to the ancient art of piloting has been hailed as one of the greatest contributions to marine safety and to the preservation of life and property afloat.

Here, we pause to look at another modern electronic marvel which has become so much a part of the daily lives of those who are entrusted with the responsibilities of safely navigating ever-increasing tonnage in larger and larger packages and at greater speeds. Unlike single-channel VHF bridge-to-bridge radiotelephony, RADAR has been on the bridge of merchant ships for almost 20 years. Its value to today's navigator is unquestionable; yet, there are many who feel that, somewhere along the line the true fulfillment of radar's promise is yet to be achieved . What is it that is standing between us and the full utilization of radar's potentialities? Just what does the navigator need to help him get the most out of his radar set?

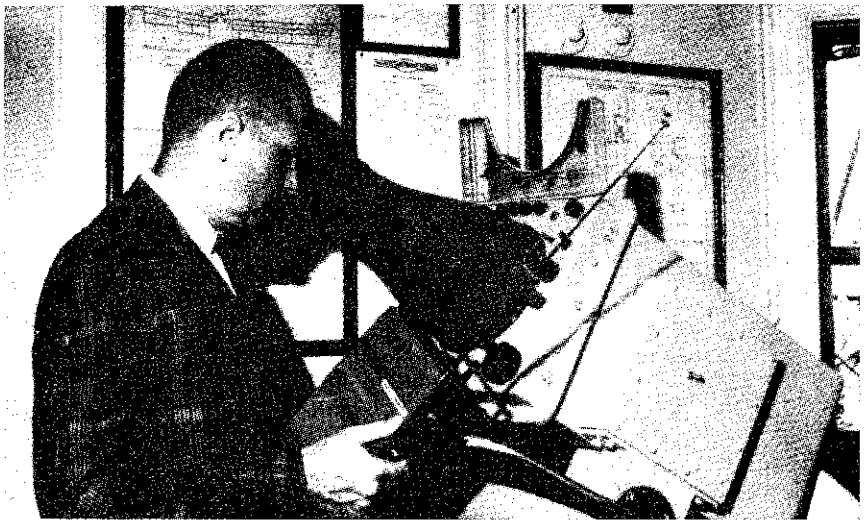
There are no simple answers to these questions; however, some requirements have been recognized. It is hoped that some of these particular requirements may eventually be incorporated into new equipment.

PILOTS' USE OF VESSELS NAVIGATIONAL AIDS

First, let us set the stage by examining briefly the role of the pilot and his relationship to the vessel, and the other ship's officers. The pilot is a licensed merchant marine deck officer who has been well-trained and examined in most of the same subjects of seamanship as the master and the mates. However, the pilot's professional abilities are most highly refined in local knowledge and ship handling in confined waters. With these special skills, the pilot, in his capacity as advisor to the master, is in a position to supplement the captain's own knowledge and work with him using the vessel's equipment to bring the ship safely into port. The pilot must depend more and more on efficient use of gyro compass, bridge-to-bridge radio, and radar as the size and speed of ships increase. Not being a regular member of the ship's company, however, the pilot is at somewhat of a disadvantage at being constantly faced with unfamiliar equipment, the operation and performance of which he has had no previous opportunity to check. This is not usually as serious an obstacle as it might seem initially, since the ability to adapt quickly to strange ships and strange customs is also a very important knack of the pilot's art, and one in which he also becomes highly proficient if he desires to live to be an old pilot. Of all the various navigational gear the pilots find on the bridge, the radar set is likely to be the most unpredictable. Even sets of the same design and manufacture are likely to give widely varying results, depending upon the particular installation and the maintenance it has received. We shall examine these problems at greater detail later.

RADAR INDISPENSABLE PILOTING TOOL

Why has radar become such an indispensable tool of the pilot's trade? The most popular answer to that question is that radar is a tremendous assist in periods of fog or reduced visibility on account of rain or snow. There is the persistent notion in the minds of the layman that radar allows the navigator to "see" through the fog and that ships may hurtle blindly along at full speed, oblivious to the Rules of the Road. The prudent pilot, knowing full well that this is not true, is nevertheless able to use his radar in poor visibility to cope with modern conditions which were never envisioned by the mariners of less than a generation ago. Consider the Delaware River with its 125-mile-long channel, 800 feet wide, 40-foot depth; ships of the 70,000 DWT class are daily traders, 85,000-ton tankers are not at all unusual, with ever-increasing sizes appearing all the time. Fog may roll in at almost any time, especially during the spring and fall months, with snowstorms common in the winter. What do you do with an ore carrier, 800 feet long, drawing 39 feet, and a two-knot following current, when you can't see the bow? If a pilot ever needed a radar, he needs one here and the best is none too good! In years gone by, when ships were small, easily maneuverable, and of light draft in relation to the channel, it was almost universal practice to drop the hook until it had cleared. Today this is out of the question for many ships; for, once committed to the channel, it is almost impossible to stop without dire consequences.



PILOT IVES making use of radar intelligence. Portable radio is in hand ready for direct voice communication with approaching vessel.

In the case of the average freighter struggling to meet shore labor commitments, judicious use of the radar and good seamanship often permit a safe and timely passage when otherwise it would have been impossible. Many times there is patchy fog over one section of the river and clear sailing just beyond; radar can make all the difference here. Then, too, should it become advisable to anchor during poor visibility, with the radar, a pilot can spot his vessel in an anchorage safely out of the channel. Accurate anchor bearings can be taken and maintained, and a good lookout may be kept for approaching vessels even though it is "thick as mud."

FULL RADAR UTILIZATION

While radar and fog seem inseparable to the average person, the pilot will be quick to recognize that there are many more uses for this remarkable invention which makes his job easier and hence increases the reliability and safety of the performance of his duty. During the hours of darkness, radar will indicate the presence of unlighted aids to navigation, small craft, floating objects, barges adrift; all of these may escape the eyes of the keenest lookout. The radar presentation also helps restore a sense of depth perception which can become so tricky at night. Many navigators will tell you that they have been fooled more than once by a distant bright light appearing closer than a weak one nearby.

Even in broad, clear daylight, radar serves to modify the pilot's ancient art into a more exact science. Distances may be accurately measured in miles and even yards. A simple mathematical calculation will quickly give the speed of an approaching vessel or of a ship about to be overtaken so that overtaking and passing situations can be resolved with the greatest safety. When coming to anchor, the pilot knows exactly how much room he has between several other ships; and his position, once the hook is down, can be seen immediately in relation to the other vessels and the river banks.

RADAR LIMITATIONS

These benefits are not without their limitations as any experienced navigator will be quick to tell you. As an assist to the pilot in good visibility, there is very little problem; as a total substitute for the pilot's vision, however, radar leaves a lot to be desired. There are probably many people today who still hold to the popular notion that radar allows one to "see" through the fog in the same way that television allows us to see into the studio and observe the performers as though we were in the front row of the auditorium. Those who work with radar know this to be far from the truth; yet, piloting is an art built largely upon the use of the trained eye and acquired through years of discipline and practice. Take away the compass, the pelorus, the charts; the experienced pilot will put a ship exactly where he wants her by "rack of the eye." Ask him to explain this process, and he will probably be unable to give you an easy answer. The things his eye takes in are many and varied; the changing range of a tree and a building, the set of the current past a buoy, a peculiar alignment of certain piers, buildings, etc. The slightest motion of any of these is meaningful to the pilot. What happens when the pilot cannot see these things and must depend upon the radar presentation?

RADAR PICTURE AS VIEWED BY THE PILOT

Assuming that the pilot is well-indoctrinated in the use of the radar and is able to interpret what he sees on the radar screen, what does he find missing? First, he will be disappointed to discover that his machine does not pick up everything that he could see with his eye, in fact, he will probably have to be content with a partial outline of the river bank, ships nearby, and an occasional buoy or two. In place of the many visual stimuli to which he has become accustomed, he now must settle for a flat two-dimensional presentation compressed onto a 16-inch, or smaller, screen showing only principal outstanding targets, their range and bearing. To make matters worse, a small 12-foot buoy with a radar reflector will appear about the same size on the screen as a 50,000-ton supertanker fully loaded with gasoline. This same tanker will appear substantially the same on his screen whether it is head on or broadside, anchored or underway. Only through a time-consuming process of constant observation can any sort of idea of relative motion be gained. Then, too, should this tanker be close to the buoy, the observer might very well see only one target and imprudently assume it to be only the buoy he is looking for. You can imagine the consequences.

The problems of the river pilot's relationship with his radar set are not unique. The needs of the navigator in this field must not be completely overlooked. At the Safety of Life at Sea Conference in 1960, considerable thought was given to the recognition of radar as an aid to navigation and to the setting up of certain standards and criteria for the equipment. Most of the references and recommendations of Recommendation 45 coming out of this conference concerned radar equipment in a broad sense with very little regard to the specific problems of radar in inland waters. It would be advantageous to touch briefly on some of the various references and recommendations, especially as they apply to piloting.

In Recommendation 45, SOLAS '60, section 1. (iv) and (c), there is mention of the possible benefit of securing uniformity in the selection of ranges of view. This is always desirable from the standpoint that it is one less thing to which the pilot has to become adjusted on a strange ship, but in practice since the pilot is by nature very flexible and quickly adapts to his new environment, it is a relatively small advantage. The pilot may be looking into a strange radar but the targets he sees are in his home waters and the distances between most of them are well known to him. Thus it is really not as important whether the ranges are uniform from one ship to another as it is that there is a good selection of close and intermediate ranges from which to choose. Here we have the crux of the matter. Many sets in use today have no range less than 1 mile. The one-half-mile range found on other units is indispensable for close maneuvering around other vessels, in canals, and even through drawbridges. The choice of other ranges is largely a matter of local geography and the pilot's personal taste. A 2-mile range, for example, still gives a good presentation for maneuvering but adds perspective by including more targets, some shoreline or buoys perhaps, and helps a pilot keep his bearings while the vessel is twisting and turning. Greater ranges are often needed in rivers for a look ahead to the next obstacle or to survey an anchorage. The pilot can seldom use over 10 miles. These various ranges can also be made more useful to the pilot in close quarters through the inclusion of other electrical and mechanical features such as improved anticlutter circuits, multi-speed antenna rotation, sector scan, and offcenter presentation whereby one may look ahead a distance of 2 miles on the scale of 1 mile.

RADAR SET UNIFORMITY

Now, let us look at the desirability of a certain amount of uniformity in regards to the actual operation of the radar set. Most ships' officers are not expert radar technicians; neither are the pilots who may be looking at a particular set for the first time. The general operating controls found on the various radars are often a mystery to the sailor. What one manufacturer considers an important operating adjustment may be found hidden behind a panel on another set. Many sets have an overabundance of complicated adjustments in plain view which are too often misadjusted accidentally at a critical moment. So far as the pilot is concerned, the operation and maintenance of the radar equipment is properly the complete responsibility of the master and the ship's officers who have had ample opportunity to become proficient in the operation of their particular set. However, some uniformity in the type, number, location, and labeling of controls could be most helpful to all of us.

Recommendation 45, Section A, deals at some length with detailed performance standards which are of considerable concern to the pilot who is looking for optimum results from the radar equipment. The standards set forth in this section are being met or exceeded by, it is believed, almost all radar units presently being manufactured for large ships.

THE PILOT'S RADAR NEEDS

We have already touched on range. Pilots are not interested in maximum range nor are they usually concerned with the effects of heavy rolling. What the pilot really wants is maximum performance at the minimum ranges. He needs to pick up small craft and buoys, keeping them in view right down the side of his ship. He must also have good resolution so that he can distinguish between two or more targets at nearly the same range and azimuth. This is most important in narrow waterways where it is constantly necessary to separate ships from buoys in extremely close quarters. Range and bearing accuracy is important to the pilot where an error of just a few feet may be a considerable percentage of the available channel. By far, the most useful device on the radar screen, and oddly enough the one most prone to inaccuracy, is the heading flash. This electronic lubber line is the closest substitute for the pilot's "rack of the eye" when visibility is down. Using this thin beam, the pilot must line up his vessel to pass between two other ships or obstructions, pass close to buoys or lighthouses, or bring her to a new course after negotiating a turn at the same time watching for the effects of current set or wind. The magnitude of just a 1- or 2-degree error in the narrow confines of an 800-foot channel, where large vessels are passing within less than 100 feet of each other, can be substantial. Unfortunately, there is almost no way a pilot can quickly check this for himself on a strange ship. This is a principal complaint of many pilots.

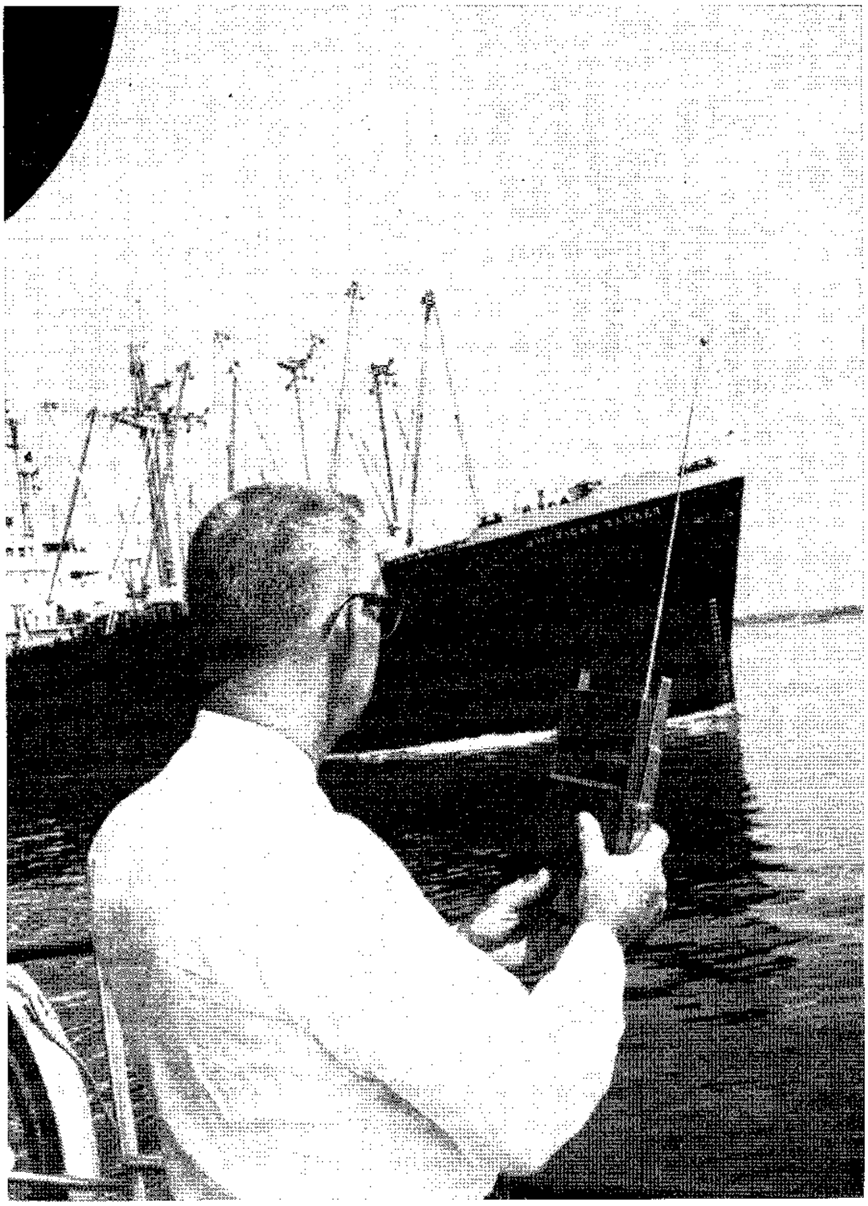
Durability is another desirable feaure ranking second only to the accurate heading flash on the pilots' list. Obviously, if a set is not working, it is of absolutely no use to the pilot or the ship. Pilots find many radar sets not working and far too many more not working properly. Basic trouble-free design with proper protection from mechanical vibration and the elements is probably the first essential. However, the best efforts in this field are only conditional upon the unit being maintained so that it is performing up to its original specifications at all times.

PILOT DESIGNS A RADAR

In essence then, what does a pilot really need in a radar unit and what can industry do about it? For one thing, it is becoming increasingly common to find two complete radars on the bridge of the modern ship. This is in apparent recognition of the fact that the requirements for deep sea navigation and inland piloting are not being sufficiently reconciled in a single unit. This may also indicate recognition of the indispensability of radar and the fact that factory service stations are few and far between at sea. The average general purpose radar for merchant ships must usually be a compromise between short- and long-range requirements. There are circuits and devices to reduce power, pulse width, and rep. rate on the shorter ranges all of which may or may not be sufficiently effective in increasing its usefulness to the pilot. A unit designed specifically for inland navigation should be fitted, in addition to the vessel's normal radar installation, for optimum results in close quarters. If this is not acceptable, then a very real effort should be made to devise ways of incorporating all of the desirable short-range features into a general purpose marine radar. Most shipmasters would probably agree that really long ranges are of little value on a radar used exclusively for navigation and anti-collision purposes; what takes place in the final several miles—inland or at sea—is what is going to make the difference.

RADAR MAINTENANCE VITAL

Whatever direction industry may take in future radar design, one thing is certain: Radar's value to the pilot will continue to be only as good as the maintenance the unit receives. Without a doubt, regular expert maintenance is the key to the story. Most mates and radio officers are becoming highly competent at tube substitution in a frantic effort to restore some sort of a picture 2 days out at sea. Unfortunately, this is seldom followed up by a complete systems check after the vessel has docked. Then, how often must an otherwise competent service technician, having restored a picture, sign off the job as completed so that the vessel may sail on schedule. What is happening to all the sophisticated engineering, the tuned circuits—especially IF and video bandpass, as this performance is repeated time after time? Isn't it reasonable to conclude that before long, the fine engineering originally built into the set gradually deteriorates until one day, somebody wonders why the radar doesn't pick up the targets. Pilots, because they are usually on a different ship every day, are in a unique position to compare various radars under the same conditions; they can testify to the poor performance of some radar units due to faulty maintenance. The time is at hand to acknowledge the only real solution to this problem: an electronics technician in the regular ship's company. This expert will have a complete line of test equipment and spares aboard to ensure radar performance up to original specifications at all times. He will become sufficiently familiar with his own set so that the slightest departure from optimum will be evident immediately, and he will take prompt steps to correct it.



Delaware River Pilot uses his portable VHF unit to communicate directly with overtaking vessel.

INSTALLATION

The radar's initial installation may also prove faulty from a pilot's point of view. The indicator console is often found located at some relatively inaccessible spot on the bridge or in some cases, in the chartroom. It may be in an enclosure of some sort in an effort to cut down mechanical noise and glare; hoods and light shields complicate the situation. These are all a handicap to the pilot, since, the nature of his job requires that he cannot be a radar observer. In fog, he must be back and forth; outside listening for signals, looking into the mist, directing rudder and engine movements, checking the compass heading—and at the same time trying to get an occasional look at the radar. Some improvement in daylight presentation that would ease the transition from bright glare to radar screen would be most advantageous. Important consideration must also be given to the location of the scanner if the radar is to be of maximum use in inland waters. The antenna must be high and well forward so that it commands an unobstructed view of everything ahead; blind sectors from masts, king posts, and derricks cannot be tolerated if the radar is to be depended upon for navigation. Inside, there is not sufficient "sea room" to swing the ship's head as is the usual practice when these blind spots are known to exist. An unseen target in one of these sectors will often set up an extremely hazardous situation causing the pilot to lose confidence in the radar completely. Due consideration should also be given here to properly aiming the antenna so that small targets such as buoys may be seen at extremely close range; and again, it cannot be stressed too strongly the importance of accurately aligning the heading flash with the keel of the ship.

RADAR'S MISSING FACULTY

There are numerous other features of radar installations which may be of interest to the pilot. A most obvious and glaring omission exists in all modern radar stations. Work goes forward to perfect an instrument which will allow us to better penetrate the fog with our eyes—to give more and more information about the targets we pick up. We are struggling to make this information more meaningful by improvements in its presentation; we have worked out complicated systems of plotting and true motion presentation in an attempt to figure out what the other ships have *been* doing, and to try to guess what they might do in relation to our own position. What one simple improvement would immediately take 99 percent of the guesswork out of even a poor radar presentation? Where are radar's ears? We have excellent video, why not add the audio! Would not a simple single-channel VHF radiotelephone be the perfect adjunct to the complete radar?

VHF BRIDGE-TO-BRIDGE RADIO THE MISSING LINK

Is it logical that the public could be persuaded to purchase an expensive television receiver if it contained no sound channel? Would they willingly accept the idea, as unfortunately some shipping people have, that they can very easily tune in the TV sound on their multi-channel hi-fi FM receiver across the room? A single-channel VHF transceiver built into and part of the radar console would be the other partner in an unbeatable combination! Bridge-to-bridge radio's value to the navigator is widely recognized; in conjunction with radar in fog, its proven performance is unbelievable. On the Delaware River, where radar plotting is impractical, short-range radio exchanges from ship to ship insure positive radar identification; and the pilots are able to impart their intentions to each other so that all doubt is removed, and hazardous meeting and passing situations are resolved with maximum safety. Even at sea—or maybe especially at sea—voice communications between the bridges of ships can be used in conjunction with radar plotting and true motion as a double check with this important advantage: bridge-to-bridge radio can tell the navigator what the other vessel *intends* to do. The most sophisticated system of radar presentation yet to be devised will never do this!

A single-channel transceiver could easily be built right into new radar units, or offered as a kit for installation in earlier models. Installation would require only connection to a VHF antenna and possibly a remote microphone if desired. What frequency? Who cares as long as it is universal the world over. We more or less arbitrarily chose VHF channel 13, 156.65 mc. This may have been an unfortunate selection inasmuch as it is right in the middle of a maritime band; and there is a persistent tendency, on the part of some people, to confuse this concept with a multichannel communications system. It was never intended to be part of a communications system; it is a piece of pure navigational gear not unlike the ship's whistle or a giant loud hailer. The modern ship has at its disposal a wealth of elaborate communications equipment: multichannel VHF, single sideband, radio teletype, facsimile—to name just a few. Let us put the single-channel bridge-to-bridge radiotelephone where it properly belongs, in the radar, where it will be recognized for what it really is: Radar's sound channel, the ears of the modern navigator in fair weather or foul!

(SCHAD CONTINUED)

(*Continued From Page 81*)

Because of concern within the shipping industry over the use of radio frequencies other than 156.65 mc.—as described in this article—a Special Committee on Bridge-to-Bridge Communication was formed by the American Merchant Marine Institute. This committee recognized that 156.65 mc. best served the shipowners' and navigators' prime interest in safety and soon reached the position that governmental regulation would be necessary to establish this restricted-to-navigation frequency in all U.S. ports.

Subsequently, the committee held several meetings with representatives of the Coast Guard and the Federal Communications Commission, who likewise were studying independently the overall question of bridge-to-bridge radiotelephone as related to navigational safety. These meetings have been very encouraging, and we are hopeful that a standard system will soon be forthcoming by official requirement for the establishment of capability on 156.65 mc. as a requirement for all U.S. Government and commercial vessels operating in U.S. waters (other than the Great Lakes).

All of us who are involved in maritime affairs recognize that regulations, while solving specific problems, sometimes create new problems. We do sincerely believe, however, that—on balance—the humanitarian and practical cause of increased maritime safety will be better served by the standardization of 156.65 mc. for single-channel bridge-to-bridge radiotelephone communications pertaining to navigation.

Standardization has proven to be advantageous, even necessary, in many and varied practices and procedures and, in these cases, with major benefits such as bringing order out of confusion as well as creating efficiency, economy, and dependability. Experience over the last several years indicates that standardization is paramount to achieving the basic objective of the bridge-to-bridge radiotelephone program as an aid to safety of navigation. The many benefits of standardization and the primary consideration of safety to life, limb, and property offered by the 156.65 mc. concept all point to the desirability of immediate action by the U.S. Coast Guard.

A Short Course

WHAT IS BRIDGE TO BRIDGE VHF?

By

LCDR Don Cunningham, USCG

LCDR Cunningham, a Rules of the Road specialist assigned to duties in that field at Coast Guard Headquarters, lays out the operational workings of a typical bridge-to-bridge system.

WHAT PILOT, master, or deck watch officer has not on occasion felt gnawing doubt as to the intentions of an approaching ship and wished the means were available to simply talk over the situation with the man on the other bridge?

VHF–FM bridge-to-bridge radiotelephony, as noted in the preceding articles, is rapidly gaining popularity in this country because it offers just this sort of capability. Supporters claim it will extend the mariner's voice in much the same way that radar has extended his vision.

VHF–FM (Very High Frequency—Frequency Modulation) bridge-to-bridge is a relatively static-free, short-range radiotelephone installed on the bridge of ships for the exchange of information vital to safe navigation. It is an INVALUABLE AID TO THE MAN ON THE BRIDGE and is commonly considered to be analogous to a high-quality, long-range megaphone.

It is standard practice to have "back-up" capability for much of the essential machinery in the engine-room, the failure of which could jeopardize a vessel. VHF–FM might well be thought of as a "backup" to the whistle, now often the only means available for arranging passing agreements.

Due to the relative newness of its implementation, an evaluation of VHF–FM bridge-to-bridge as related to collision statistics will require more time. However, Coast Guard figures substantiate the fact that areas which have recently subscribed to a bridge-to-bridge radiotelephone system have shown a resultant marked decrease in the number of collisions sustained.

HOW BRIDGE-TO-BRIDGE WORKS

Let's project ourselves into the following little story:—

The SS *Downbound,* a 455-foot light-laden freighter, proceeded down the Mississippi River at close to 20 knots with the assist of a powerful current. It was a dark, clear March morning and navigational lights on the shore winked out of the darkness ahead of the ship.

The veteran pilot on the bridge knew that Sixty Mile bend lay ahead and he mentally reviewed his recollection of it—a slow, 90-degree turn to starboard for a downbound vessel. He eased over to the left descending bank so there'd be a share of the 700-yard wide channel available to any upbound traffic.

This would mean passing starboard-to-starboard. Western Rivers Rules allow this with an appropriate exchange of whistle signals.

In the meantime, approaching from the south, the SS *Upbound,* a 559-foot deep-laden bulk carrier forged ahead at about 10 knots as she closed Sixty Mile bend and the SS *Downbound.*

The *Upbound's* pilot sighted the open range lights and green sidelight of the *Downbound* and immediately proposed a starboard-to-starboard passage with a two-blast whistle signal. His radar revealed the *Downbound* to be rounding the bend, 1½ miles distant, about a third of the channel width off the left descending bank.

The situation appeared to be all but resolved when *Upbound's* pilot heard a two-blast signal come back over the intervening water, apparently in confirmation of his proposal. *Upbound's* pilot felt relieved by such an early answer. Even when he heard and answered another two-blast signal he was not alarmed.

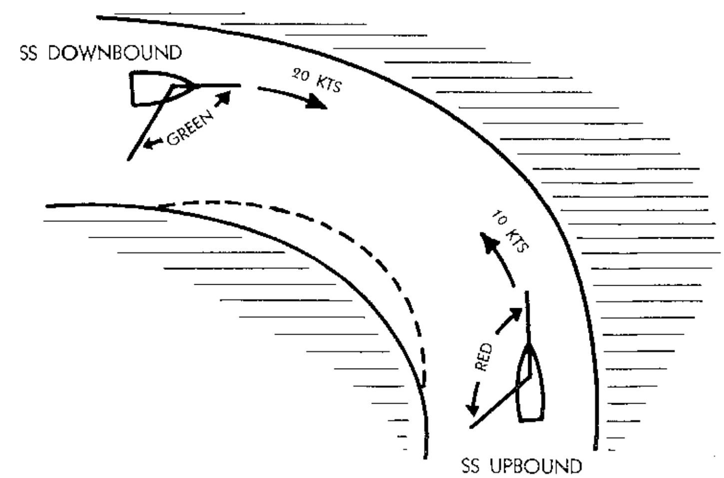
(It could be noted at this point, that, with a range rate of close to 30 knots, there were only about 3 minutes between initial sighting and clear passage or collision.

Also, the sketch will show that even with a clear starboard-to-starboard approach the *Upbound's* red sidelight remains open in this situation until a very close range due to channel contour. (Sketch 1).

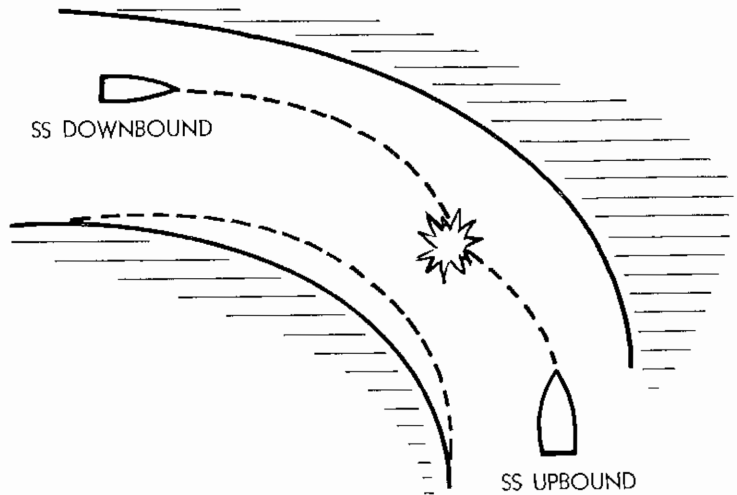
All was not so calm on the bridge of the SS *Downbound!* The pilot had not heard either of *Upbound's* two-blast signals. His own two-blast proposals had gone unanswered. Time was running out—the *Upbound's* red sidelight was still open—little change could be detected in *Upbound's* range lights—"HELMSMAN—FULL RIGHT RUDDER"—"SOUND THE DANGER SIGNAL"—"BACK FULL"—THE STAGE IS SET FOR A MARINE DISASTER. In a matter of seconds these two proud vessels could easily be reduced to scrap metal and many of their crews lost. The overriding reason: *INADEQUATE COMMUNICATION BETWEEN THE MEN ON THE BRIDGES.* Sketch 2.

Let's visualize what would happen in this situation if both vessels were equipped with a VHF–FM bridge-to-bridge radiotelephone. As the situation becomes doubtful, the *Downbound* pilot is in instant, clear, and direct contact with the *Upbound* pilot. See sketch 3: Thus, with any uncertainty promptly resolved, two-whistle blasts are exchanged to conform with Rules of the Road, and the two ships confidently pass without incident.

SIMPLE? Of course it's simple. This is the beauty of a VHF–FM bridge-to-bridge radiotelephone. It reduces the meeting situation to essentials—an exchange of intentions between two pilots so they can keep their vessels clear of each other.



SKETCH 1



SKETCH 2

THERE IS A NEED

As waterways in and around the United States have been improved, not only have oceangoing bulk carriers increased in size but they have penetrated further into the Nation's interior. Our inland marine industry has kept pace and, today, it has become commonplace to see powerful diesel towboats pushing multiple-barge tows of well over 1,000 feet in length on our rivers.

All this can mean relatively cumbersome vessels meeting in restricted channels, with precise shiphandling a must for safe passage. Add to the pilot's burden of responsibility the uncertainty of unheard whistle signals and the danger has increased many-fold.

The importance of bridge-to-bridge for U.S. waters increases sharply because of two key features unique to our local Rules of the Road:

(1) In waters governed by our Inland, Western Rivers and Great Lakes Rules, whistle signals are required in every head-to-head meeting situation to transmit the *intent* of both pilots (i.e. to pass port-to-port or starboard-to-starboard). In other words, there is a mandatory exchange of signals whereas, in this situation, the International Rules call for a whistle signal only upon a rudder change. This ties in directly with the fact that—(2) the narrow channel rule of the International Rules of the Road, which basically requires vessels to keep to the starboard side of narrow channels and thus pass port-to-port, is not applicable to several U.S. waterways, notable among which is most of the twisting Mississippi River. The effect of this is that vessels may, and do, pass on *either* side of each other in meeting situations, making a rapid and accurate exchange of passing information imperative.

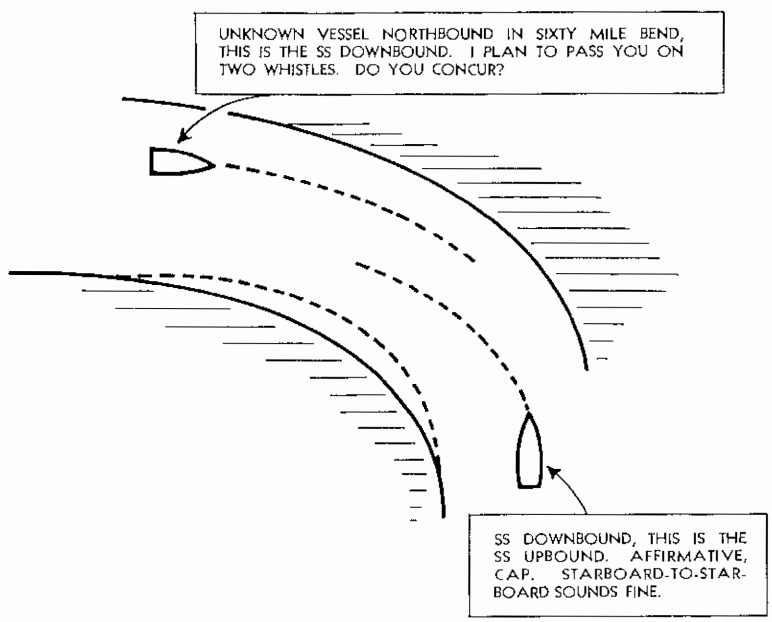
Whistle signals—in some areas supplemented by whistle lights—have long been the best available way to do this. However, suffice it to say, sound is a notoriously inefficient and unpredictable means of exchanging such vital information. The exhaust noise of today's powerful diesel engines certainly adds to this ineffectiveness.

The numerous breakdowns of whistle signals as a means of communication are closely documented by the records of such marine casualties as the *Alcoa Corsair—Lorenzo Marcello* and *Bonnie D—Boheme* collision cases. And for each such tragedy there are a hundred near misses which have left their mark only in the minds of the men involved.

VHF–FM bridge-to-bridge is a device which has been basically instituted to serve the needs of the man on the bridge who holds the instant responsibility for the safety of his vessel, cargo, and crew. To point up the severity of this responsibility, Coast Guard figures show that the total number of collisions between commercial vessels within U.S. jurisdiction during 1964 resulted in the loss of 3? lives and property damage of over *$17 million*.

THE NEED FOR A SYSTEM TO "BACK-UP" WHISTLE SIGNALS AS A MEANS OF EXCHANGING NAVIGATIONAL INFORMATION BETWEEN VESSELS IS ALMOST UNQUESTIONED. AND VHF–FM BRIDGE-TO-BRIDGE IS JUST THAT SYSTEM. IT ADVANCES THE ART OF SAFELY PASSING OTHER VESSELS TO A LEVEL COMMENSURATE WITH THE IMPROVED TECHNOLOGY OF THIS MODERN ERA.

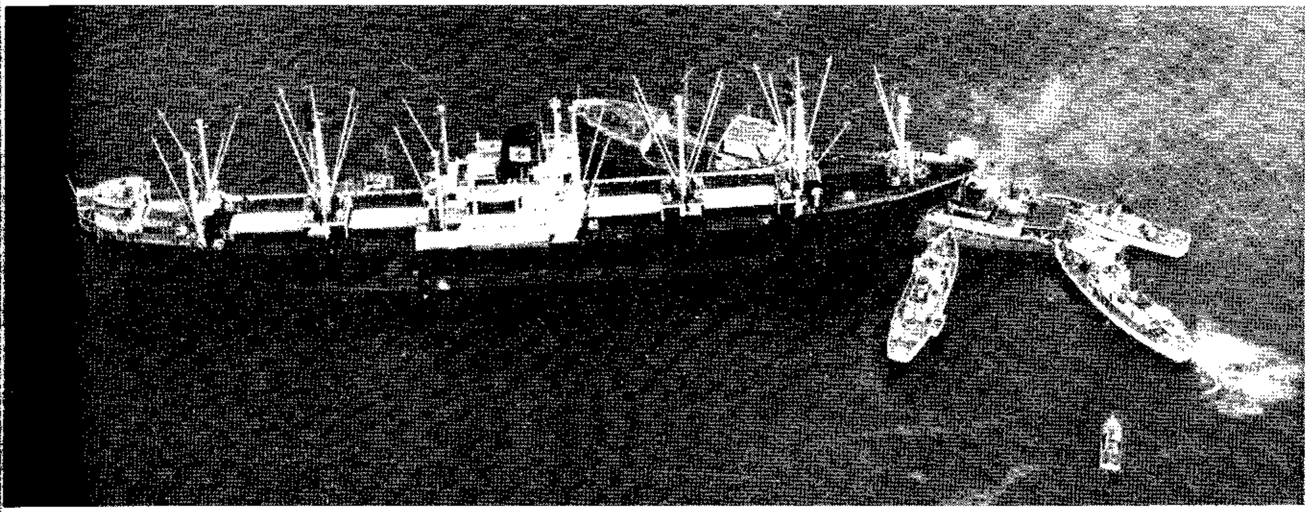
The Proceedings will survey the developments in Sea Traffic Lanes and Harbor Surveillance Radar in the not too distant future.



SKETCH 3

DYNAFUEL—FERNVIEW FINDINGS APPROVED

On 14 November 1963 the American tank ship *Dynafuel* and Norwegian freighter *Fernview* collided in dense fog in the Buzzards Bay, Mass., main channel. After due consideration of the findings, conclusions, and recommendations of the Marine Board of Investigation convened to investigate the mishap, the Commandant has announced his action. It follows verbatim below.



COAST GUARD CUTTERS AT SIDE OF CRIPPLED DYNAFUEL

TREASURY DEPARTMENT
UNITED STATES COAST GUARD

3 December 1964

Commandant's Action on Marine Board of Investigation; collision of the M/V *Dynafuel* and the M/V *Fernview*, in Buzzards Bay, on 14 November 1963, without loss of life

1. The record of the Marine Board of Investigation convened to investigate subject casualty, together with the findings of fact, conclusions and recommendations, has been reviewed.

2. At about 0658, on 14 November 1963, the Norwegian freighter *Fernview* collided in dense fog with the U.S. tank vessel *Dynafuel* in the western approaches to Buzzards Bay.

3. The collision occurred in daylight with otherwise good visibility being limited by fog, in patches, to a distance varying between ⅛ and 2 miles. The wind was from the northwest at about 17 miles per hour. The tidal current was nearly slack.

4. The collision occurred in Buzzards Bay main channel. The scene is bounded on the east by Buzzards Bay mid-channel lighted bell buoy BB, on the west by Hen and Chickens lighted gong buoy 3, on the south by Penikese lighted bell buoy No. 4 and on the north by Mishaum Ledge lighted gong buoy 3A. The channel which is about 9 miles long and slightly over a mile wide is oriented in a 065°–245° axis. Coast and Geodetic Survey Chart 1210 encompasses the area.

5. There is a discrepancy of approximately 3 minutes between the time kept by the two vessels. The time maintained by the *Dynafuel* is arbitrarily accepted as correct. Three minutes must be added to times given by witnesses of the *Fernview*.

6. The *Fernview*, en route New York to Boston passed Buzzards Bay Entrance Light abeam to starboard at a distance of ½-mile and steadied on course 024° True, speed about 18 knots. The pilot, master and chief officer were on the bridge. The radar was in operation on the 6 mile range and was being used to check the vessel's progress by observing buoys along the vessel's track. At about 0638, fog patches were encountered, fog signals commenced and a lookout stationed at the bow. There was no reduction in speed. As Hen and Chickens lighted gong buoy 3 passed abeam to port, course was changed to the right, and at 0644 the vessel was steady on course 064° True, with the buoy ½-mile distant on the port quarter. The ship continued on and at 0653 was observed by radar to pass between Mishaum Ledge lighted gong buoy 3A and Penikese lighted bell buoy 4. The master, who was observing the radar, testified that the vessel was to the right of the center of the channel. At 0654, the master observed a weak radar contact about 10° on the starboard bow at a distance of approximately ½ mile. Moments later as the *Dynafuel* was sighted slightly on the starboard bow, the rudder of the *Fernview* was ordered full right and the engines full astern. At 0655, the bow of the *Fernview* collided with the port side of the *Dynafuel* just aft of the midship house at an angle of about 30°. Apparently, the only person on the *Fernview* to hear fog signals from the *Dynafuel* was the lookout who reported same immediately prior to collision.

7. Witnesses for the *Fernview* testified that, following the collision, a series of tests revealed that when the cargo booms were topped-up as they were at the time of collision, they interfered with the radar and caused a "blind zone"

from 005° to 007° relative on the starboard bow and from 353° to 355° relative on the port bow.

8. The *Dynafuel* en route Cape Cod Canal to Newark, N.J., in ballast, passed Buzzards Bay midchannel lighted bell buoy BB close aboard to starboard at 0627 and steadied on course 244° True, speed about 10 knots. The master, chief officer, helmsman and lookout were on the bridge. The radar was in operation and, since it was not connected to the gyro compass, presented a relative representation. Fog was encountered at about 0635; fog signals were commenced and the engines placed on standby. At about 0636, radar contact was made with the *Fernview* bearing about 10° on the port bow, distance 8 miles. Engine speed was reduced to slow and the course changed to 259° True which placed the radar contact about 25° to 30° on the port bow. The master and chief officer continued to observe the radar contact; at 0653 with the contact still approximately 30° on the port bow at a distance of approximately 1¼ miles, course was changed to 269° True pgc and the engine stopped. The *Fernview* was sighted through the fog on the port bow of the *Dynafuel* at a distance of about ⅛ mile at 0657. The rudder of the *Dynafuel* was placed hard right and the engine full astern. Backing and danger signals were sounded on the whistle; the general alarm was rung. The collision occurred at 0658 with the ship nearly dead in the water. Witnesses from the *Dynafuel* testified that they did not hear the *Fernview's* fog signals. Neither the master nor the chief officer of the *Dynafuel* maintained a radar plot of the *Fernview's* approach.

9. Immediately following the collision, the fixed CO_2 fire extinguishing system for the cargo tanks of the *Dynafuel* were released. However, the engineroom and after portion of the vessel was on fire; and the crew of the *Dynafuel,* four of whom were injured in varying degrees, abandoned the tanker and went on board the *Fernview.* Coast Guard assistance arrived at about 0900, and by about 1200 the fire was under control and extinguished by late afternoon. The ships remained locked together until approximately 0730 on 15 November when they separated and the *Dynafuel* capsized and sank.

REMARKS

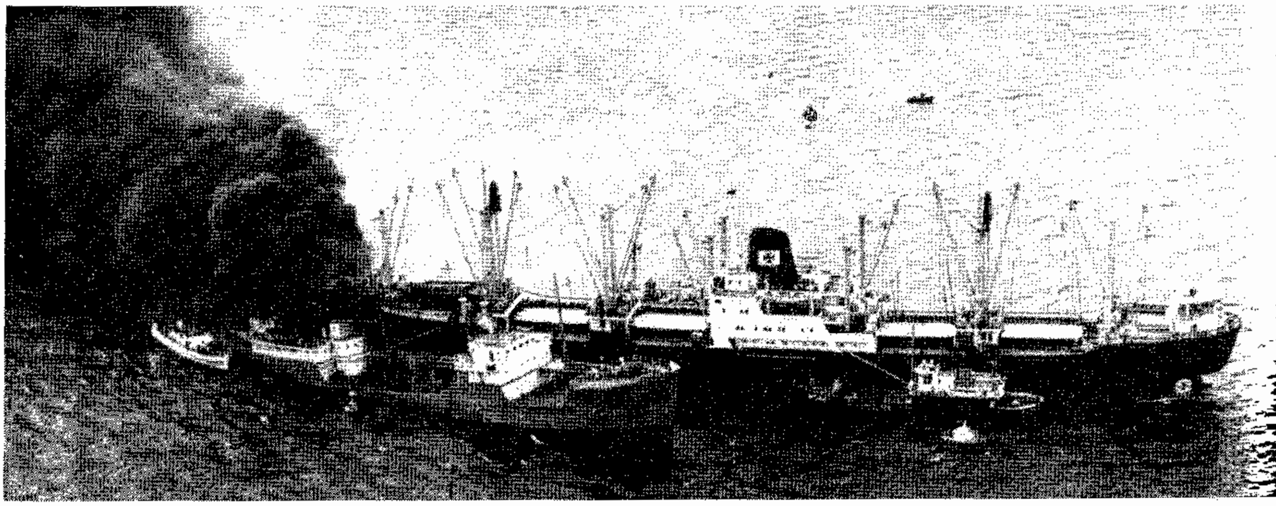
1. It is considered that the principal cause of this casualty was the failure of the M/V *Fernview* to proceed at a moderate speed in fog.

2. The Board's conclusion that the *Dynafuel* was with the "blind zone" of the *Fernview's* radar and remained u detected until about a ½-mile away is concurred However, this condition in no way lessens the fault on part of the *Fernview* for its failure to go at a moder speed and serves to reiterate the hazards of relying so on radar when navigating in fog and the necessity f masters, mates and pilots to comply with their statut responsibility to go at a moderate speed.

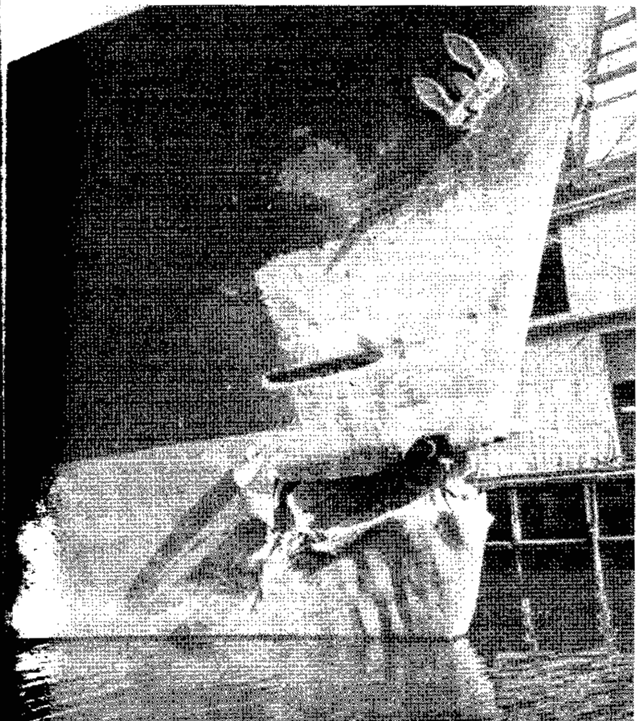
3. The Board's recommendations to cite the owners the *Fernview* for violation of 33 USC 192 and to instit further investigation under the suspension and revocat proceedings against the pilot of the *Fernview* are co curred in; and action has been instituted in both cas

4. The *Dynafuel* is considered to have, in the main, co plied with its statutory responsibilities prior to and at time of the collision. Upon entering the fog, the engi were placed on standby and the fog signals commence when radar contact was made with the *Fernview,* sp was reduced to slow, and the course changed 15 deg to the right; when the range closed to 1¼ miles, the gines were stopped and course changed another 10 deg to the right; when collision was imminent, the engi were backed full, and rudder placed full right; and the time of the collision, the vessel was dead in the wa or nearly so. Although a radar plot would have confir a developing dangerous situation of which the master already innately aware, it is doubtful that any subsequ maneuver based on information obtained from suc plot would have placed the *Dynafuel* beyond the reac danger. The purpose of Article 16 of the Rules of Road is to remove from the potentially hazardous fog si ation as much danger as possible. The master of *Dynafuel* had a right to expect the *Fernview* to com with its statutory responsibility and to proceed with c tion. Accordingly, the Board's recommendations to the owners of the *Dynafuel* and to conduct an investi tion under the suspension and revocation proceedings respect to the failure of the master of the *Dynafuel* to the *Fernview* are disapproved.

5. The Board's conclusion that the position of the lision was 41°, 28.2 N., 70°, 56.5 W., is not concurred Recognizing that it is difficult to establish the exact p tion of a collision which occurs in dense fog, it is c sidered that the position given by the master of *Fernview* of 41°, 28.8 N., 70°, 55.8 W. is more nearly cor In this regard, there was no material change in the co



SMOKE BILLOWS FROM DYNAFUEL AFTER QUARTERS



FERNVIEWS DAMAGED BOW

COAST GUARD HELICOPTER REPLENISHES FOAM SUPPLY TO CUTTER FIRE FIGHTING UNITS

d speed of the *Fernview* between the time the master, o was watching the radar, observed the ship pass be- een Mishaum Ledge lighted gong buoy 3A and Penikese hted bell buoy 4 and the collision. Further, this position in close proximity to those given by the licensed Pilot d the chief officer; and the position subsequently de- rmined by the Coast Guard Hearing Examiner.

6. The Board's conclusion that the phenomena of the nd zone on either side of the *Fernview's* bow was un- own to her personnel but that the possible existence of ch blind zones was within the cognizance of the pilot o neither mentioned it to the vessel's master nor took eps to compensate for their possible existence requires nsiderable qualification. It appears that the vessel's rsonnel were not aware of the blind zones and in the sence of technical information concerning the radar stallation and additional general information concern- g the vessel's operation, the reason why the existence of e blind zones was undetected cannot be determined. owever, the board's implication that the pilot was aware the possible existence of such blind spots and should ve mentioned it to the vessel's master or taken steps to mpensate for their existence is not concurred in. Al- ough the pilot may have known from experience on her vessels that king posts and cargo booms could inter- re with the operation of a vessel's radar, he cannot be pected to be completely familiar with each vessel's aracteristics. The master of a vessel is at all times timately responsible for its safety and bears the respon- bility for informing the pilot of any unusual peculiarities the vessel's equipment and operation.

7. Subject to the foregoing remarks, the Record of the arine Board of Investigation is approved.

W. D. Shields,
VADM, U.S. Coast Guard,
Acting Commandant

MARINE CHEMISTS CREDENTIALS

Industry's confidence in marine chemists has long been an established fact. Some yards and operators, however, are not familiar with the depth of background training required of these men before marine certification is issued. In general, a marine chemist applicant must fulfill the following requirements: (*a*) a college degree in chemistry or chemical engineering, (*b*) 3 years' postgraduate experience in the chemical industry, (*c*) not less than 300 hours' actual supervised training in shipboard work involving the testing and inspection of tank and other vessels to be repaired. When the Qualifications Board has approved of these and other requirements, the maritime industry can be assured that every marine chemist is not only a tank tester, but a qualified professional chemical consultant.

From the Marine Chemists Log #7

NOTICE

REGULATIONS of the Congressional Joint Committee on Printing and Binding require annual verification of all mailing lists maintained for the purpose of free distribution of Government publications.

All addressees on the mailing list for the PROCEEDINGS have been sent a card requesting that an affirmative reply be returned to the Commandant (CMC), United States Coast Guard, Washington, D.C., 20226.

1960 AND 1948 INTERNATIONAL RULES COMPARED: REVISIONS OF RULES 14, 15, AND 16 EXPLAINED

This sixth article of a series continues the comparison of the 1948 International Rules of the Road presently in use with the revised 1960 International Rules which will become effective on 1 September 1965.

In the following presentation, the 1960 rule appears in standard roman type immediately followed by the superseded 1948 rule. A resume of primary changes follows the rule presentation.

PART B—LIGHTS AND SHAPES

RULE 14

1960 INTERNATIONAL RULES

A vessel proceeding under sail, when also being propelled by machinery, shall carry in the daytime forward, where it can best be seen, one black conical shape, point downwards, not less than 2 feet in diameter at its base.

Changed. 1948 Rule reads:

A vessel proceeding under sail, when also being propelled by machinery, shall carry in the daytime forward, where it can best be seen, one black conical shape, point upwards, not less than 2 feet in diameter at its base.

PRIMARY CHANGES

1. The day signal to be carried by vessels propelled by sail and power is unchanged except that it is now to be carried point downwards.

PART C.—SOUND SIGNALS AND CONDUCT IN RESTRICTED VISIBILITY

PRELIMINARY

1. The possession of information obtained from radar does not relieve any vessel of the obligation of conforming strictly with the Rules and, in particular, the obligations contained in Rules 15 and 16.
2. The Annex to the Rules contains recommendations intended to assist in the use of radar as an aid to avoiding collision in restricted visibility.

RULE 15

1960 INTERNATIONAL RULES

(a) A power-driven vessel of 40 feet or more in length shall be provided with an efficient whistle, sounded by steam or by some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient fog horn to be sounded by mechanical means, and also with an efficient bell. A sailing vessel of 40 feet or more in length shall be provided with a similar fog horn and bell.

Changed. 1948 Rule reads:

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

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

(Same as 1948 Rule)

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

(Same as 1948 Rule)

(ii) by sailing vessels on the foghorn;

(Same as 1948 Rule)

(iii) by vessels towed on the whistle or foghorn.

(Same as 1948 Rule)

(c) In fog, mist, falling snow, heavy rainstorms, or any other condition similarly restricting visibility, whether by day or night, the signals prescribed in this Rule shall be used as follows:

(Same as 1948 Rule)

(i) A power-driven vessel making way through the water shall sound at intervals of not more than 2 minutes a prolonged blast.

(Same as 1948 Rule)

(ii) A power-driven vessel underway, but stopped and making no way through the water, shall sound at intervals of not more than 2 minutes two prolonged blasts, with an interval of about 1 second between them.

(Same as 1948 Rule)

(iii) A sailing vessel underway shall sound, at intervals of not more than 1 minute, when on the starboard tack one blast, when on the port tack two blasts in succession, and when with the wind abaft the beam three blasts in succession.

(Same as 1948 Rule)

(iv) A vessel when at anch[illegible] shall at intervals of not more than [illegible] minute ring the bell rapidly for abo[illegible] 5 seconds. In vessels of more tha[illegible] 350 feet in length the bell shall b[illegible] sounded in the forepart of the vessel and in addition there shall be sound[illegible] in the afterpart of the vessel, at intervals of not more than 1 minute f[illegible] about 5 seconds, a gong or other in[illegible]strument, the tone and sounding [illegible] which cannot be confused with that [illegible] the bell. Every vessel at anchor m[illegible] in addition, in accordance with R[illegible] 12, sound three blasts in successio[illegible] namely, one short, one prolonged, a[illegible] one short blast, to give warning of h[illegible] position and of the possibility of co[illegible]sion to an approaching vessel.

(Same as 1948 Rule)

(v) A vessel when towing, a vess[illegible] engaged in laying or in picking u[illegible] submarine cable or navigation ma[illegible] and a vessel underway which is una[illegible] to get out of the way of an approac[illegible]ing vessel through being not und[illegible] command or unable to maneuver [illegible] required by these Rules shall, inste[illegible] of the signals prescribed in subse[illegible]tions (i), (ii), and (iii) sound, [illegible] intervals of not more than 1 minu[illegible] three blasts in succession, namely, o[illegible] prolonged blast followed by two sh[illegible] blasts.

(Same as 1948 Rule)

(vi) A vessel towed, or, if mo[illegible] than one vessel is towed, only the la[illegible] vessel of the tow, if manned, shall [illegible] intervals of not more than 1 minu[illegible] sound four blasts in successio[illegible] namely, one prolonged blast follow[illegible] by three short blasts. When pra[illegible]ticable, this signal shall be made i[illegible]mediately after the signal made [illegible] the towing vessel.

(Same as 1948 Rule)

(vii) A vessel aground shall g[illegible] the bell signal and, if required, [illegible] gong signal, prescribed in subsec[illegible] (iv) and shall, in addition, give 3 s[illegible]arate and distinct strokes on the [illegible] immediately before and after [illegible] rapid ringing of the bell.

Changed. 1948 Rule reads:

(vii) A vessel aground shall give the signal prescribed in subsection (iv) and shall, in addition, give three separate and distinct strokes on the bell immediately before and after each such signal.

(viii) A vessel engaged in fis[illegible] when under way or at anchor sha[illegible] intervals of not more than 1 mi[illegible] sound the signal prescribed in subs[illegible]tion (v). A vessel when fishing w[illegible] trolling lines and under way s[illegible] sound the signals prescribed in subsection (i), (ii), or (iii) as may be appropriate.

Changed. 1948 Rule 15(c)(ix) reads:

> (ix) A vessel when fishing, if of 20 tons or upwards, shall at intervals of not more than 1 minute, sound a blast, such blast to be followed by ringing the bell; or she may sound, in lieu of these signals, a blast consisting of a series of several alternate notes of higher and lower pitch.

(ix) A vessel of less than 40 feet in length, a rowing boat, or a seaplane on the water, shall not be obliged to give the above-mentioned signals but if she does not, she shall make some other efficient sound signal at intervals of not more than 1 minute.

Changed. 1948 Rule 15(c)(viii) reads:

> (viii) A vessel of less than 20 tons, a rowing boat, or a seaplane on the water, shall not be obliged to give the above-mentioned signals, but if she does not, she shall make some other efficient sound signal at intervals of not more than 1 minute.

(x) A power-driven pilot-vessel when engaged on pilotage duty may, in addition to the signals prescribed in subsections (i), (ii), and (iv), sound an identity signal consisting of 4 short blasts.

New. This Rule has no 1948 Counterpart.

PRIMARY CHANGES

1. The 1960 Rules have been arranged so that Rules 15 and 16 now come under a new Part C—*Sound Signals and Conduct in Restricted Visibility*. Two preliminary statements relating to the use of radar have been added under the heading of Part C. These statements make no change to existing International Rules and make it clear that vessels using radar are still responsible for conforming strictly with the Rules. The second preliminary statement only points out that there is an annex to the Rules which contains recommendations on the use of radar.

2. Rule 15(a) has been modified to clearly show that power-driven vessels of less than 40 feet in length are not required to carry the specified whistle, fog horn, and bell. Relative to the equipment required by this Rule it should be recalled that the Rule 1 definition of whistle has been changed from a meaning of "whistle or siren" to "any appliance capable of producing the prescribed short and prolonged blasts." A siren is not in compliance with the Rules unless it can meet the requirements of the new definition.

3. In keeping with the overall change to the Rules, length rather than tonnage is used to classify vessels. Under the new Rule 15(a) sailing vessels are not required to provide an efficient fog horn to be sounded by mechanical means and an efficient bell unless 40 feet or more in length.

4. Rule 15(c)(vii), relating to the sound signal for vessels aground during conditions of restricted visibility, has been amended so that the "3 separate and distinct strokes on the bell" are now sounded immediately before and after the prescribed ringing of the bell only and not immediately before and after *each* of the signals of Rule 15(c)(iv) (i.e. ringing of the bell and sounding of gong or other instrument). Further, any doubt as to the appropriateness of the short-prolonged-short sound signal of 15(c)(v) to a vessel aground has been resolved in the *1960* Rules. The signal is not applicable to a vessel aground.

5. The fog signal for a vessel engaged in fishing (except vessels trolling) is now identical with the signal for a vessel unable to get out of the way of an approaching vessel through being not under command or unable to maneuver—one prolonged blast followed by two short blasts. This is a change from the *1948* Rule 9 which specified a blast to be followed by ringing the bell or a blast consisting of a series of several alternate notes of higher and lower pitch.

6. The *1960* Rule 9 now uses the cut-off point of 40 feet rather than 20 tons, below which vessels and seaplanes on the water, and all rowboats, need not sound the specified fog signals of this Rule.

7. In addition to the regular fog signal for a power-driven vessel underway, underway without way, or at anchor, a distinctive identity signal of 4 short blasts is now prescribed as an option by Rule 15(c)(x) for a power-driven pilot-vessel engaged on pilotage duty.

RULE 16

1960 INTERNATIONAL RULES

(a) Every vessel, or seaplane when taxiing on the water, shall, in fog, mist, falling snow, heavy rainstorms or any other condition similarly restricting visibility, go at a moderate speed, having careful regard to the existing circumstances and conditions.

(Same as 1948 Rule).

(b) A power-driven vessel hearing, apparently forward of her beam, the fog-signal of a vessel the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

(Same as 1948 Rule.)

(c) A power-driven vessel which detects the presence of another vessel forward of her beam before hearing her fog signal or sighting her visually may take early and substantial action to avoid a close quarters situation but, if this cannot be avoided, she shall, so far as the circumstances of the case admit, stop her engines in proper time to avoid collision and then navigate with caution until danger of collision is over.

(New. No 1948 Counterpart.)

PRIMARY CHANGES

1. There has been considerable expansion of the information in the International Rules relating to conduct of vessels in restricted visibility to take into account the use of radar. Preliminary statements have been added to the new Part C, there is a new Rule 16(c), and an Annex to the Rules contains recommendations "in the use of radar as an aid to avoiding collision in restricted visibility."

2. The wording of Rules 16(a) and 16(b) have not been changed although "moderate speed" in 16(a) and ascertainment of position in 16(b) are correlated to the use of radar in the Annex to the Rules.

3. The new Rule 16(c) allows a power-driven vessel to take "early and substantial action to avoid a close quarters situation" when, prior to "hearing her fog signal or sighting her visually," she picks up another vessel on the radar forward of her beam. When this close quarters situation cannot be avoided "she shall, so far as the circumstances of the case admit, stop her engines in proper time to avoid collision and then navigate with caution until danger of collision is over."

BACK COVER MORAL

One of the prime factors that cause lost time accidents has to do with sailors not looking where they walk on deck after the discharge of peas, beans, and like material. Despite the fact that each and every sailor may know of the discharge or loading of such cargo, it behooves the chief officer to remind the bosun, prior to "turn-to" to caution each and every man under his supervision. Despite all precautions taken when handling such cargo, it is frequently found that some of this material remains on deck, and a little may be fully as hazardous as a great deal.

Courtesy Pacific Maritime Association

MARITIME SIDELIGHTS

NEW U.S. COAST GUARD FRYING PAN SHOALS Offshore Light Tower, placed in operation on November 24, 1964, replaces a famous old 133-foot Lightship (*WAL–537*) which guarded the shoals 28 miles southeast of Cape Fear, N.C., since she was built in 1930. The lightship circles the tower here, gives three farewell whistle blasts, and departs for Morehead City, N.C., to prepare for her new assignment at Cape May, N.J., replacing the 52-year-old lightship "*Relief*", retired January 15.

ANOTHER OFFSHORE LIGHT TOWER IN OPERATION

Frying Pan Shoals Offshore Lig Tower off Cape Fear, N.C., has bee placed in operation.

Begun in August 1964, the ne tower was designed by the Coa Guard to withstand impact of ex traordinary wind and wave actio Its life expectancy is 75 years. A cre of six Coast Guardsmen operate t new navigational aid, as compared the 16- to 20-man crew required operate a lightship.

The 550-ton deckhouse of the tow is 25 feet high, 86 feet square, and supported on four steel legs spre 60 feet apart. These legs are encas in 36-inch diameter steel pilin driven 293 feet below the ocean flo Braced portions of the legs show above the water are 70 feet high. T deckhouse provides living quarte and radiobeacon, communications a oceanographic equipment. Its ro serves as a landing platform for t largest of Coast Guard rescue he copters such as the HH–52A fly boat seen on the platform in photo.

On one corner of the deckhouse 32-foot tower supporting a rad beacon antenna, and a lantern ho ing a 3.5 million candlepower lig which from its elevation of 175-fe above water is visible to mariners miles seaward.

SS PRESIDENT WILSON NAMED A GALLANT SHIP

An American President Lines, L ship is the 17th vessel to be offici designated as a Gallant Ship by Maritime Administration.

The *President Wilson* was appro for the award as a result of her res of 18 survivors of the Liberian s *Agia Erini L.* off the Japanese co on February 3, 1964. See Novem 1964 *Proceedings* for story of ea Coast Guard award to the officers crew of the *President Wilson.*

The awards may be made to vessel which participated in outsta ing or gallant action in mari disasters or other emergencies for purpose of saving life or property.

nautical queries

DECK

Q. a. Describe the precautions which you would regard as necessary for personnel engaged in painting with the use of spray guns.

b. Describe the precautions necessary in painting with red lead or lead based paints.

A. a. When painting with the use of spray gun equipment personnel should wear goggles, respirators, and suitable clothing. The working spaces should be well ventilated as the respirators provide protection only against the particles of the pigment and not against volatile vapors of solvents that may be used. Flames or open lights should not be allowed near spray painting operations due to the hazard of vapor ignition and possible fire or explosion.

b. In using lead based paints the working space should be well ventilated, and if spray guns are used the precautions noted above should be heeded. Upon completion of work personnel should be cautioned to clean off carefully any paint that may have splashed on their hands or skins, due to the possible danger of lead poisoning.

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

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

Q. A vessel whose date is 10 October, while in West Longitude, crosses the International Date Line on a west bound course at 0800 Zone Time.

(a) What change does she make in her local date?

(b) What is the date and time at Greenwich when she crosses the line?

A. (a) The date is changed to 11 October.

(b) The date and time at Greenwich is 10 October, 2000.

Q. What is a Writ of Protest?

A. Declaration made by master before a notary, or consul if in a foreign port, within 24 hours of arrival, stating that he anticipates that ship or cargo or both are damaged, and that same is not due to the fault of the ship, officers, or crew, but to the perils of the sea. Must be signed by master and some members of the crew. The log book must support the writ of protest.

ENGINE

Q. Name all the internal fittings of the steam drum of a water tube boiler and state the purpose and location of each.

A. (a) Dry pipe—to collect the steam over an extended area near the top of the shell farthest removed from the surface of the water, thus preventing a sudden pull, which would promote priming.

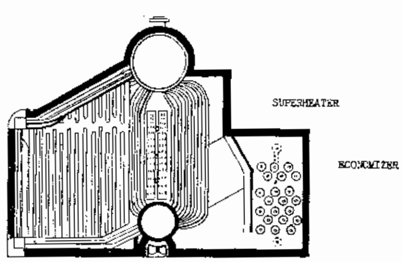
(b) Internal feed pipe—to distribute the incoming feed water over a large area and direct its flow so as to prevent it from coming in direct contact with hot surfaces. Internal feed piping may be located either below the normal water level or in the steam space. In the latter case, it also serves to liberate any oxygen in the water which is carried off in the steam.

(c) Scum pans, located just below normal water level, being a dish-like, circular plate connected by piping to the surface blow connection. It collects the scum or grease from the surface of the water and discharges same overboard when surface blow valve is open.

(d) Swash plates—to prevent excessive movement of the water when the ship is rolling. Without this arrangement, the water level in the gage glass would be unreliable in rough weather. They should extend from about the normal water level well below the surface, but should be open at the bottom to allow free passage of water to any part of the drum.

(e) Internal baffles—to prevent water splashing on dry pipes due to ebullition or other causes.

Q. Sketch a cross-sectional view of a D-type boiler with economizer.



Q. 1. Stop valves on a freon system are of the:

(a) Double packed-type
(b) Seal ring-type
(c) Packless-type
(d) (a) or (b) above
(e) (a) or (c) above

A. (e) (a) or (c) above

Q. 1. A heavy frost coating on the evaporator coils indicates:

(a) An efficient cycle of refrigeration
(b) High humidity
(c) Need for defrosting
(d) No leaks are present
(e) None of the above

A. (c) Need for defrosting

Q. 2. To determine actual oil level, you would check the compressor oil level in a freon 12 refrigeration system:

(a) When the compressor stops and immediately after a long period of operation
(b) After a long shut down period
(c) Immediately after compressor starts
(d) 12 to 20 minutes after compressor stops
(e) None of the above

A. (a) When the compressor stops and immediately after a long period of operation

Q. 3. In a refrigeration system, brine of too weak a density would:

(a) Probably freeze
(b) Probably crystallize
(c) Deposit solids
(d) (a) and (c) above
(e) None of the above

A. (a) Probably freeze

Q. 1. Adjustment of a thermostatic expansion valve in a refrigeration system is:

(a) Never necessary
(b) Provided to change the superheat setting
(c) Automatic
(d) Necessary when the box has been defrosted
(e) None of the above

A. (b) Provided to change the superheat setting.

AMENDMENTS TO REGULATIONS

TITLE 33 CHANGES

APT DESCRIPTIONS FOR RADIOBEACON SYSTEMS FOUND IN NEW REGS

Aids to Navigation regulations (33 CFR 62) have been amended to describe more accurately the operation of the marine radiobeacon system. Affected is 33 CFR Parts 62.35–1, 62.35–5, and 62.35–10. The amendments follow as they appeared in the Federal Register of February 2, 1965.

* * * * *

1. Section 62.35-1 *General* is amended to read as follows:

§ 62.35–1 General.

Maritime radiobeacons operate during specific intervals as published in Coast Guard Light Lists. For station identification simple characteristics consisting of combinations of dots and dashes are used. The characteristics of markerbeacons are composed of series of dashes for part of a 15-second cycle, which is followed by a silent period to complete the cycle. The transmitted power of maritime radiobeacons is adjusted to provide a usable signal at the service range which meets the operational requirement. Markerbeacons are of low power for local use only. Coast Guard maritime radiobeacons operate within the frequency band 285–325 kilocycles.

2. Section 62.35–5 *Carrier type operation* is amended to read as follows:

§ 62.35–5 Carrier type operation.

Radiobeacons superimpose the characteristic code on a carrier which is on continuously during the period of transmission. This extends the usefulness of maritime radiobeacons to aircraft and ships employing automatic direction finders.

3. Section 62.35–10 is amended to read as follows:

§ 62.35–10 Calibration service.

Special calibration radiobeacons, as listed in the current editions of the Coast Guard Light Lists, will broadcast continuously for the purpose of enabling vessels to calibrate their direction finders upon request either to the cognizant District Commander, or, if time does not permit, directly to the calibration station. Signals for requesting calibration service are described in the current editions of the Coast Guard Light Lists. In the case of sequenced radiobeacon stations, continuous transmission for calibration purposes cannot be made without interference resulting with other stations in the same frequency group.

MORE TITLE 33 CHANGES

CHANGES IN FEES AND CHARGES SET FOR CERTAIN SERVICES PERFORMED BY CG

Changes in fees and charges for certain services performed by the Coast Guard have been established by a new regulation. The changes which become effective 1 July 1965 are made to bring charges in line with the actual cost of the services performed.

Because these fees and charges are reprinted in none of the cost free Coast Guard pamphlets, as a public service, the *Proceedings* carries them below as they appeared in the Federal Register of February 4, 1965.

Affected is 33 Code of Federal Regulations Parts 1 and 74.

* * * * *

By virtue of the authority vested in me as Commandant, U.S. Coast Guard, by Treasury Department Orders 120 dated July 31, 1950 (15 F.R. 6521) and 167–48 dated October 19, 1962 (27 F.R. 10504), and the authority in Title 5, U.S. Code section 140 and section 92 of Title 14, U.S. Code, the following amendments and regulations are prescribed and shall be in effect on July 1, 1965.

In Subchapter A, Part 1, Subpart 1.25:

1. Section 1.25–25(b) is amended to read as follows:

§ 1.25–25 Fees for services.

* * * * *

(b) The fee of $2.50 shall be charged for the services necessary in searching Coast Guard records for the information desired when such information cannot be found.

2. Section 1.25–35(b) is amended to read as follows:

§ 1.25–35 Fees when work is not performed by the Coast Guard.

* * * * *

(b) When the copying or reproduction of a record or document by a private individual or concern is authorized, the Coast Guard fees charged shall consist of the cost of the actual time of the Coast Guard employee or employees involved in supervising the performance of such work. The minimum fee charged shall be $2.50.

3. Section 1.25–40 is revised to read as follows:

§ 1.25–40 Excerpts from official documents or records.

(a) The fees for reproduction b any method, of excerpts from offic documents or records, such as logs c Coast Guard units, sketches, char course recorder graphs, assistance re ports, weather data reports, ship building plans, etc., shall be $0.80 f each sheet, any size. The minimu fee charged shall be $2.

(b) The fees for copies of excerp from official documents or records b any other method shall be $2 for ea copy of a page, legal or smaller si and $1 for each additional copy fu nished at same time to same perso

4. Section 1.25–45 is revised to re as follows:

§ 1.25–45 Marine casualty or accid record.

(a) The fees for the transcript the record of a marine casualty or a cident, including exhibits, charts, e conducted under 46 CFR, Part 1 shall be $1 for each page of typ written copy, legal or smaller s (which may be an original or carb copy), and $0.50 for each additio copy furnished at the same time the same person (the minimum f for typewritten copies shall be $2 $0.80 for each sheet by any reprodu tion process 18″ x 24″ or smaller t may be used (the minimum fee 18″ x 24″ or smaller shall be $2); a $2.50 for each sheet by any reprodu tion process larger than 18″ x 2 which may be used.

(R.S. 4450, as amended; 46 U.S.C. 239

5. Section 1.25–50 is revised to re as follows:

§ 1.25–50 Suspension and revoca proceeding record.

(a) The fees for the transcript the record of a suspension, or revo tion proceeding, including exhib charts, etc., conducted under 46 C Part 137, shall be $1 for each page typewritten copy, legal or sma size (which may be an original or c bon copy), and $0.50 for each ad tional copy furnished at the same t to the same person (the minimum for typewritten copies shall be $ $0.80 for each sheet by any reprod tion process 18″ x 24″ or smaller t may be used (the minimum fee 18″ x 24″ or smaller shall be $ and $2.50 for each sheet by any production process larger than 18 24″ which may be used.

(R.S. 4450, as amended, secs. 1, 2, 49 S 1544, 1545, as amended, secs. 1, 2, 68 S 484, secs. 3, 68 Stat. 675, secs. 3, 70 S 152; 46 U.S.C. 239, 367, 239a, 239b, 50 U.S.C. 198)

6. Section 1.25–55 is amended read as follows:

§ 1.25–55 Excerpts from certain chant marine records.

(a) The fees for certain types of excerpts from merchant marine records are as follows:

(1) For each copy of an entry or excerpt from merchant vessel log book, the fee shall be $1.25 for each entry or excerpt with a minimum fee of $3.75.

(2) For each transcript of service of a merchant seaman prepared in letter form for someone other than the merchant seaman whose service is described therein, the fee shall be $0.35 for each entry with a minimum fee of $3.50.

(3) For a transcript of services of a merchant seaman which is furnished to the seaman on Form CG-723, the fee is $1 for the first entry and $0.10 for each additional entry requested at the same time.

7. Section 1.25–60 is revised to read as follows:

§ 1.25–60 Shipping articles.

(a) The fee for reproduction by any method of a shipping article shall be $1.25 for each sheet, any size. The minimum fee charged shall be $3.75.

(b) The fees for copies of excerpts from a shipping article by any method shall be $0.35 for each excerpt, with a minimum fee of $3.50 for each request.

8. Section 1.25–65 is revised to read as follows:

§ 1.25–65 Duplicate merchant marine documents or certificates.

(a) The fees to obtain certain duplicate merchant marine documents or certificates are as follows:

(1) Certificate of registry as staff officer (Form CG–887). The fee for a duplicate certificate of registry as staff officer is $2.00. (See 46 CFR 10.05–7(1)).

(2) Continuous discharge book (Form CG–719A). The fee for a duplicate continuous discharge book is $2.50. (See 46 CFR 12.02–23).

(3) Merchant Mariner's document (Form CG–2838). The fee for a duplicate Merchant Mariner's document is $2. (See 46 CFR 12.02–23).

(R.S. 4551, as amended, sec. 7, 49 Stat. 1936, as amended, sec. 7, 53 Stat. 1147, as amended; 46 U.S.C. 643, 689, 247)

(4) Certificate of seaman's service (Form CG–723). The fee for furnishing a merchant seaman with a chronological record of service on Form CG–723, in lieu of issuing individual certificates of discharge on Form CG–718A or in lieu of making duplicate service entries in a seaman's continuous discharge book, as authorized by 46 CFR 154.07, is $1 for the first entry and $0.10 for each additional entry requested at the same time. (See 46 CFR 12.02–23(b).

(Sec. 3, 60 Stat. 238, sec. 501, 65 Stat. 290, and sec. 633, 63 Stat. 545; 5 U.S.C. 1002, 140, 14 U.S.C. 633)

In Subchapter C, Part 74, Subpart 74.20:

1. Section 74.20–1 is amended by revising Table A to read as follows:

§ 74.20–1 Table of charges.

* * * * *

TABLE A.—STANDARD CHARGES

	Preparation of aid [1]	Service charge per month or major fraction thereof	Vessel time per hour
Lighted buoy (8′ or 9′)	$220	$90	$144
Bell or gong buoy	200	30	144
Lighted buoy (6′ or 7′)	190	75	67
Lighted buoy (5′ or less)	160	70	67
Can or nun buoy (1st or 2d class)	35	20	67
Can or nun buoy (3d or 4th class)	20	15	67
Can or nun buoy (5th, 6th, or F class)	15	10	34
Lighting apparatus (only)	50	7	34
Rebuilding minor structure on submarine sites such as piling, pile clusters, etc.			40

[1] Includes preparation, adaptation, and placing of a replacement aid (exclusive of vessel time), and preparation, adaptation, placing, retrieving, and overhaul following retrieving of a temporary aid (exclusive of vessel time).

DANGEROUS CARGO REGULATIONS IN PAPERBOUND VOLUME

The Coast Guard's Regulations for Dangerous Cargoes in effect on January 1, 1965, are now printed in a paperbound volume. Shipowners, officers, and others interested are urged to purchase these regulations.

Copies of this volume entitled "Title 46, Code of Federal Regulations, containing parts 146 and 147" (Subchapter N—Dangerous Cargoes), may be obtained as a sales publication from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402. Price $2.75.

TITLE 46 CHANGES

NUMEROUS MISCELLANEOUS AMENDMENTS PUBLISHED

An omnibus regulation change was published in the Federal Register of February 13, 1965. The purpose of these several new regulations was to bring vessel inspection regulations up to date, correct references to various laws or regulations, revise descriptions of Coast Guard procedures and to publish changes necessary to cause Coast Guard pamphlets and the Code of Federal Regulations to read alike.

Editorial changes appear in 46 CFR 10.02–5, 10.20–11, 14.05–1, 14.05–10, 14.05–20, 51.01–60, 52.50–1, 52.70–10, 53.03–35, 54.01–10, 54.03–15, 54.03–20, 54.07–5, 55.01–10, 55.10–20, 56.01–45, 56.05–6, 57.10–10, 61.01–1, 61.10–1, 61.45–1, 61.45–15, 111.05–5, 111.50–1, and 111.50–15.

Among other changes, the table of 46 CFR 51.07 has been altered, as has the table of 52.05–10; an editorial change and formula revisions affects 52.10; the table of 55.07–1 has been changed; the table of 94.10–40 has been changed; the formula of 98.25–60 has been changed; the definitions of 157.10–75 has an added entry; 164.-013–4(j) has been deleted; and 164.-013–5 of Subchapter Q has been amended.

The text of these changes are to be found in the Federal Register of February 13, 1965.

STORES AND SUPPLIES

Articles of ships' stores and supplies certificated from February 1 to February 28, 1965, inclusive, for use on board vessels in accordance with the provisions of Part 147 of the regulations governing "Explosives or Other Dangerous Articles on Board Vessels" are as follows:

CERTIFIED

Gamlen Chemical Co., 321 Victory Avenue, So. San Francisco, Calif., Certificate No. 613, dated February 26, 1965, GAMAKOTE RP–62, and Certificate No. 614, dated February 26, 1965, GAMLEN ELECSOL.

CANCELED

(Failed to renew in accordance with 46 CFR 147.03–9)

Rockland Industries, Inc., Mayflower Drive, West Hanover, Mass., Certificate No. 281, dated February 3, 1955, MM–17, and Certificate No. 291, dated January 22, 1957, DANSOLVE-36.

West Chemical Products, Inc., 42–16 West Street, Long Island City, N.Y., Certificate No. 304, dated February 1, 1950, WEST-WAX.

(Continued Next Page)

Sonneborn Chemical and Refining Corp., 300 Park Avenue, South, New York, N.Y., Certificate No. 487, dated February 13, 1961, PETROSENE D.

AFFIDAVITS

The following affidavits were accepted during the period from January 15, 1965, to February 15, 1965:

Southern Bolt & Screw Co., P.O. Box 22064, Los Angeles, Calif., 90022, BOLTING.

Sarco Co., Inc.,[1] 1951 26th St., Southwest, Allentown, Pa., 18105, VALVES & FITTINGS.

Olympic Foundry Co., 5200 Airport Way South, Seattle, Wash., 98108, VALVES, PIPE, FERROUS TUBING, FITTINGS, FLANGES, BOLTING, and CASTINGS.

King Nutronics Corp.,[2] 13826 Saticoy St., Van Nuys, Calif., 91402, VALVES.

Armco Division,[3] *Armco Steel Corp.*, 1020 Barclay Building, City Line and Belmont Aves., Bala-Cynwyd, Pa., 19004, STEEL TUBING.

Cabot Piping Systems,[4] *Plastics Division, Cabot Corp.*, 30th and Magazine Sts., Louisville, Ky., 40201, FITTINGS, VALVES, and FLANGES.

[1] Change of address.
[2] High Pressure Needle Valves only.
[3] Add ASTM A-335 to present listing.
[4] Company name changed from Tube Turns Plastics, Inc., to present name.

FUSIBLE PLUGS

The regulations prescribed in Subpart 162.014, Subchapter Q Specifications, require that manufacturers submit samples from each heat of fusible plugs for test prior to plugs manufactured from the heat being used on vessels subject to inspection by the Coast Guard. A list of ap proved heats which have been teste and found acceptable during the peri od from November 15, 1964, to Febru ary 15, 1965, is as follows:

The Lunkenheimer Co., Cincinna 14, Ohio, Heat Nos. 689, 690, 692, 69 694, 695, 696, 697, 698, 699, and 70

HYDRAULIC CAST IRON VALVES

Republic Manufacturing Co., 15655 Brookpark Road, Cleveland, Ohio, 4413 HYDRAULIC CAST IRON VALVES.

Model No.	*Pressure (psi)*
8***C-1½*S*	3, 000
8***C-20*S*	3, 000

Char-Lynn Co., 2843 26th Avenue, South, Minneapolis, Minn., CAST IRO CONTROL VALVES.

Model No.	*Pressure (psi)*
UB-11	1200
WB-11	1200
UC-11	1200
WC-11	1200
UE-11	1200
WE-11	1200
UK-11	1200
WK-11	1200
UM-11	1200
YP-11	1200
YS-11	1200
YT-11	1200

HYDRAULIC CAST ALUMINUM VALVES

Republic Manufacturing Co., 15655 Brookpark Rd., Cleveland, Ohio, 4413 ALUMINUM ALLOY VALVES.

Model No.	*Pressure (psi)*
*85 *1½D**	1,000
*85 *1¾D**	1,000
*85 *1½D**	1,000

ACCEPTABLE COVERED STEEL ARC WELDING ELECTRODES

The following are additions to the list of electrodes which are acceptable to the U.S. Coast Guard for use in weld fabrications.

Distributors and/or manufacturers	Brand	AWS Class	Operating Positions and Electrode Sizes (Inches).				
			5/32 and smaller	3/16	7/32	1/4	5/
McKay Co., Grantley Rd., York, Pa., 17405	McKay 8018-C3	8018	1	1	2	2	
Do	McKay 9018	9018	1	1	1	2	-------
Do	McKay 11018	11018	1	1	2	2	-------
Do	McKay 12018	12018	1	1	2	-------	-------
Do	McKay 18-8, Type 308, AC-DC	308-16	1	2	-------	2	-------
Do	McKay 18-8 ELC, Type 308 ELC, DC Lime	308L-15	1	2	-------	2	-------
Do	McKay 18-8 ELC, Type 308 ELC, AC-DC	308L-16	1	2	-------	2	-------
Do	McKay 18-8 HC Type 308 HC Lime	308 HiC-15	1	2	-------	2	-------
Do	McKay 18-8 HC Type, 308 HC AC-DC	308 HiC-16	1	2	-------	2	-------
Do	McKay 25-12, Type 309, DC Lime	309-15	1	2	-------	2	-------
Do	McKay 25-12, Type 309, AC-DC	309-16	1	2	-------	2	-------
Do	McKay Armorloy "C"	310-15	1	2	-------	2	
Do	McKay 25-20, Type 310, AC-DC	310-16	1	2	-------	2	
Do	McKay 29-9, Type 312, DC Lime	312-15	1	2	-------	2	-------
Do	McKay 29-9, Type 312, AC-DC	312-16	1	2	-------	2	-------
Do	McKay Type 316, 18-8 Mo	316-15	1	2	-------	2	-------
Do	McKay 18-8 Mo, Type 316, AC-DC	316-16	1	2	-------	2	-------
Do	McKay 18-8 Mo ELC, Type 316-ELC, DC Lime	316L-15	1	2	-------	2	-------
Do	McKay 18-8 Mo ELC, Type 316-ELC, AC-DC	316L-16	1	2	-------	2	-------
Do	McKay 18-8 Mo Cb, Type 318, DC Lime	318-15	1	2	-------	2	-------
Do	McKay 18-8 Mo Cb, Type 318, AC-DC	318-16	1	2	-------	2	-------
Do	McKay 18-8 Cb, Type 347, DC Lime	347-15	1	2	-------	2	-------
Do	McKay 18-8 Cb, Type 347, AC-DC	347-16	1	2	-------	2	-------
Do	McKay 19-9 W Mo, Type 349, DC Lime	349-15	1	2	-------	-------	-------
Do	McKay 19-9 W Mo, AC-DC	349-16	1	2	-------	-------	-------
Do	McKay 16.8.2, DC Lime	16. 8. 2-15	1	2	-------	2	-------

MERCHANT MARINE SAFETY PUBLICATIONS

The following publications of marine safety rules and regulations may be obtained from the nearest marine inspection office of the U.S. Coast Guard. Because changes to the rules and regulations are made from time to time, these publications, between revisions, must be kept current by the individual consulting the latest applicable Federal Register. (Official changes to all Federal rules and regulations are published in the Federal Register, printed daily except Sunday, Monday, and days following holidays.) The date of each Coast Guard publication in the table below is indicated in parentheses following its title. The dates of the Federal Registers affecting each publication are noted after the date of each edition.

The Federal Register may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402. Subscription rate is $1.50 per month or $15 per year, payable in advance. Individual copies may be purchased so long as they are available. The charge for individual copies of the Federal Register varies in proportion to the size of the issue but will be 15 cents unless otherwise noted in the table of changes below. Regulations for Dangerous Cargoes, 46 CFR 146 and 147 (Subchapter N), dated January 1, 1965 are now available from the Superintendent of Documents, price $2.75.

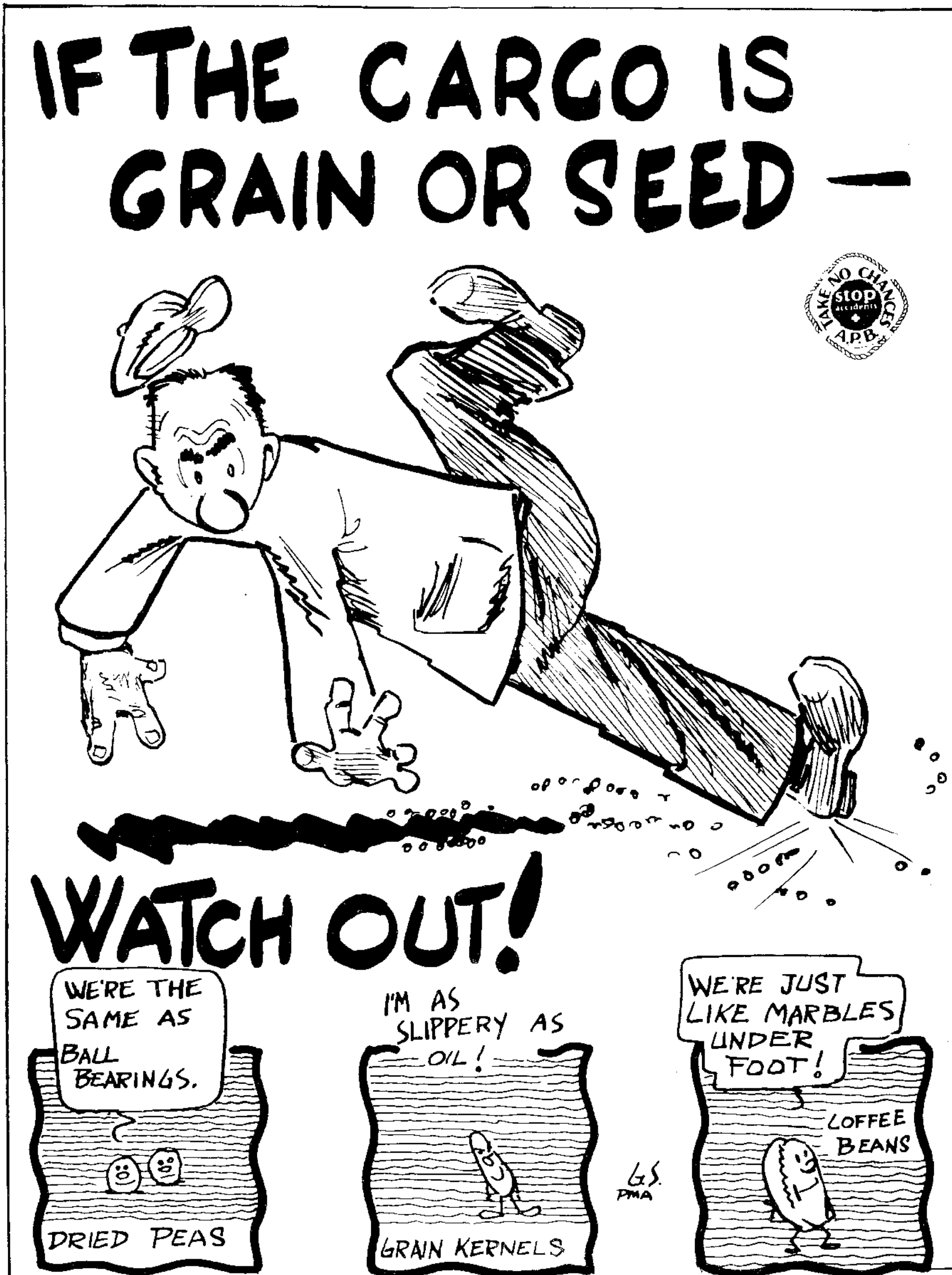
CG No. **TITLE OF PUBLICATION**

101 Specimen Examination for Merchant Marine Deck Officers (7–1–63).
108 Rules and Regulations for Military Explosives and Hazardous Munitions (8–1–62).
115 Marine Engineering Regulations and Material Specifications (9–1–64). F.R. 2–13–65.
123 Rules and Regulations for Tank Vessels (4–1–64). F.R. 5–16–64, 6–5–64.
129 Proceedings of the Merchant Marine Council (Monthly).
169 Rules of the Road—International—Inland (6–1–62), F.R. 1–18–63, 5–23–63, 5–29–63, 7–6–63, 10–2–63, 12–13–63, 4–30–64, 11–5–64, 12–18–64.
172 Rules of the Road—Great Lakes (6–1–62). F.R. 8–31–62, 5–11–63, 5–23–63, 5–29–63, 10–2–63, 10–15–63, 4–30–64, 11–5–64.
174 A Manual for the Safe Handling of Inflammable and Combustible Liquids (3–2–64).
175 Manual for Lifeboatmen, Able Seamen, and Qualified Members of Engine Department (9–1–60).
176 Load Line Regulation (7–1–63). F.R. 4–14–64, 10–27–64.
182 Specimen Examinations for Merchant Marine Engineer Licenses (7–1–63).
184 Rules of the Road—Western Rivers (6–1–62). F.R. 1–18–63, 5–23–63, 5–29–63, 9–25–63, 10–2–63, 10–15–63, 11–5–64.
190 Equipment Lists (8–3–64). F.R. 10–21–64, 10–27–64.
191 Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel (2–1–65). F.R. 2–13–65.
200 Marine Investigation Regulations and Suspension and Revocation Proceedings (10–1–63). F.R. 11–5–64.
220 Specimen Examination Questions for Licenses as Master, Mate, and Pilot of Central Western Rivers Vessels (4–1–57).
227 Laws Governing Marine Inspection (6–1–62).
239 Security of Vessels and Waterfront Facilities (7–1–64).
249 Merchant Marine Council Public Hearing Agenda (Annually).
256 Rules and Regulations for Passenger Vessels (4–1–64). F.R. 6–5–64.
257 Rules and Regulations for Cargo and Miscellaneous Vessels (9–1–64). F.R. 2–13–65.
258 Rules and Regulations for Uninspected Vessels (1–2–64), F.R. 6–5–64, 6–6–64, 9–1–64.
259 Electrical Engineering Regulations (7–1–64). F.R. 2–13–65.
266 Rules and Regulations for Bulk Grain Cargoes (7–1–64).
268 Rules and Regulations for Manning of Vessels (2–1–63). F.R. 2–13–65.
269 Rules and Regulations for Nautical Schools (5–1–63). F.R. 10–2–63, 6–5–64.
270 Rules and Regulations for Marine Engineering Installations Contracted for Prior to July 1, 1935 (11–19–52). F.R. 12–5–53, 12–28–55, 6–20–59, 3–17–60.
293 Miscellaneous Electrical Equipment List (6–1–64).
320 Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf (10–1–59). F.R. 10–25–60, 11–3–61, 4–10–62, 4–24–63, 10–27–64.
323 Rules and Regulations for Small Passenger Vessels (Under 100 Gross Tons) (2–3–64) F.R. 6–5–64.
329 Fire Fighting Manual for Tank Vessels (4–1–58).

CHANGES PUBLISHED DURING FEBRUARY 1965

The following have been modified by Federal Register:

CG–115, CG–191, CG–257, CG–259, and CG–268 Federal Register, February 13, 1965.


IF THE CARGO IS GRAIN OR SEED —
TAKE NO CHANCES
STOP accidents
A.P.B.
WATCH OUT!
WE'RE THE SAME AS BALL BEARINGS.
DRIED PEAS
I'M AS SLIPPERY AS OIL!
GRAIN KERNELS
WE'RE JUST LIKE MARBLES UNDER FOOT!
COFFEE BEANS
G.S.
PMA