PROCEEDINGS OF THE

MERCHANT MARINE COUNCIL

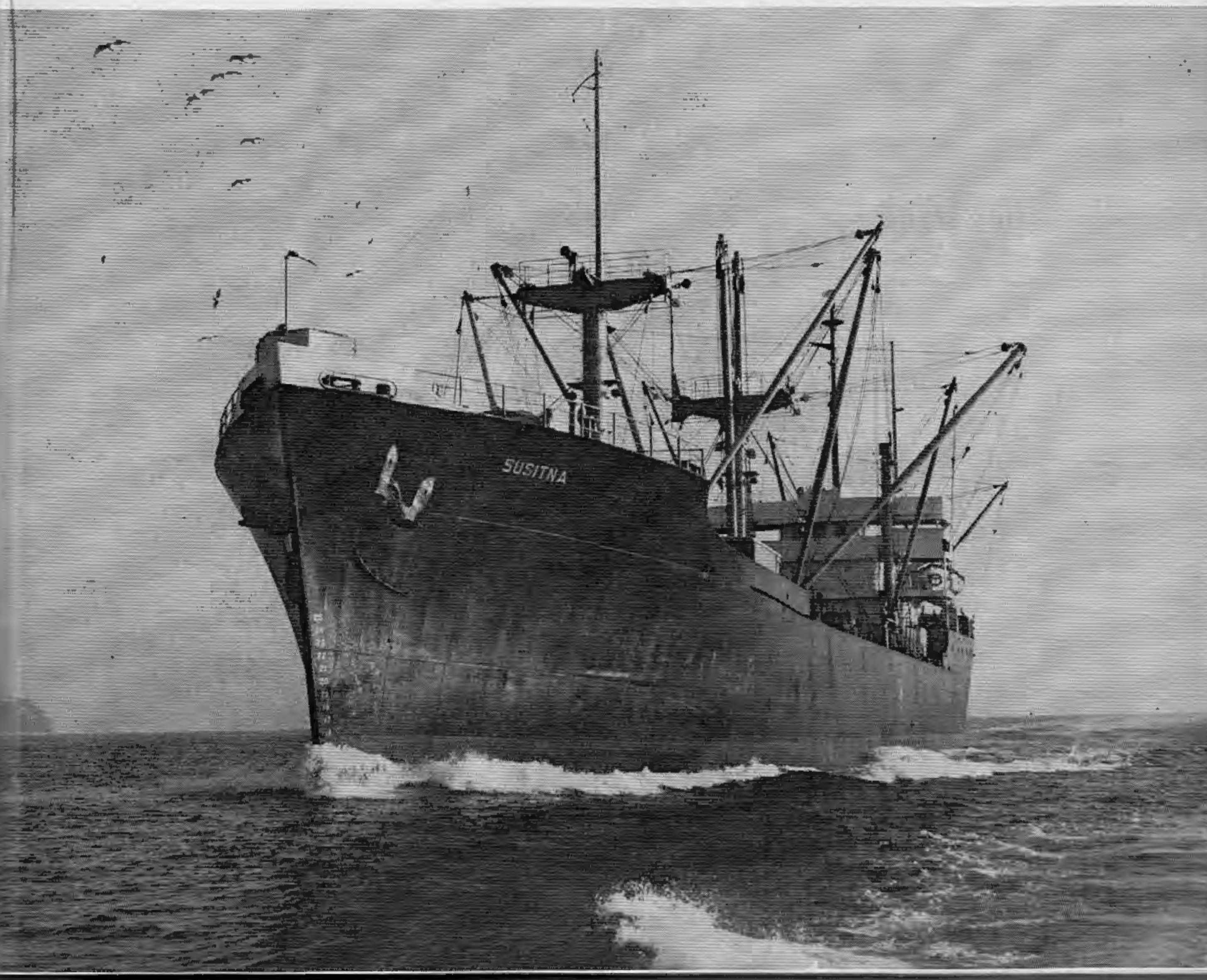
The printing of this publication has been approved by the Director of the Bureau of the Budget, January 14, 1955.

UNITED STATES COAST GUARD

This copy for not less than 20 readers. PASS IT ALONG

CG 129

Vol. 14 April 1957 No. 4



Proceedings of the

MERCHANT MARINE COUNCIL

Published monthly at Coast Guard Headquarters, Washington 25, D. C., under the auspices of the Merchant Marine Council, in the interest of safety at sea. Special permission for republication, either in whole or in part, with the exception of copyrighted articles or pictures, is not required provided credit is given to the Proceedings of the Merchant Marine Council.

CONTENTS

FRONT COVER

Wheeling sea gulls "convoy" the MV *Susitna* as she departs the Puget Sound for a voyage to Alaska. Photograph courtesy *Alaska Steamship Company.*

BACK COVER

Houston Pilot F. A. Parker climbs aboard the SS *Frank Lykes* at the sea buoy. Photograph by Richard Pervin from the *Houston Port Book.*

DISTRIBUTION (SDL 64)

A: a aa b c d (2); remainder (1)
B: e (35); c (16); f (4); h (3); g (2); remainder (1)
C: a b (less Quonset Pt.) c d e f g i m o w (1)
D: i (5); a b c d e f g h j k m (1)
E: o (New London only) (1)
List 141M
List 111

BIRTHDAY GREETINGS

This year 1957 marks the Sesquicentennial Celebration of the United States Coast and Geodetic Survey, and we in the Coast Guard are proud to join in wishing them "Happy Birthday."

Their patient accumulation of data for accurate land, air, and water charts has increased safety for all means of transportation. Since its formation in 1807, when President Thomas Jefferson was authorized to establish an agency for surveying and charting the coast of the United States and off-lying islands, the Survey has found its way into our everyday life in tide tables, aeronautical charts, nautical charts, starting points for surveyors, and studies in magnetism, seismology, and gravity and astronomical observations.

Increased speed of ships and aircraft has meant an ever increasing need for the positive reliability found in charts stamped "U. S. Coast and Geodetic Survey."

A. C. Richmond

Vice Admiral, U. S. Coast Guard
Commandant

THE NAUTICAL CHART—BASIC AID TO NAVIGATION

By John A. McCormick

(Chief, Coast Pilot Branch, Coast and Geodetic Survey)

THE lights and buoys and fog signals maintained by the Coast Guard along the Nation's coasts and waterways are the navigational aids that mark the land, the isolated dangers, and the natural and improved channels. The electronic aids—radiobeacons, radar, and Loran—enable the mariner to peer through fog and darkness and to determine his position far out at sea. But the basic aid to navigation is the nautical chart, upon which the mariner plots his observations to determine at all times his exact position with relation to the land and to hidden dangers.

Highlighting the history of nautical charts are the studies of Claudius Ptolemy, Egyptian mathematician and geographer of the second century; the Portolan charts of the 14th century; and the Mercator projection of the 16th century. The voyages of Columbus and other explorers, in the 15th and 16th centuries, and the invention of the chronometer, in the 18th century, were tremendous influences on the development of charting.

Today's nautical charts of United States coastal waters are produced by the Coast and Geodetic Survey of the U. S. Department of Commerce. The Survey observes its sesquicentennial during the year 1957, for it was on February 10, 1807, that President Thomas Jefferson approved an act of Congress which authorized and requested him to cause a survey to be taken of the coasts of the United States and to take such further action as he deemed proper for completing an accurate chart of every part of these coasts.

Photo Courtesy U. S. Coast and Geodetic Survey

DECK SCENE aboard a U. S. Coast and Geodetic Wire-Drag Launch as the crew prepares to launch apparatus for searching out underwater obstructions.

FIRST CHART ISSUED

On July 21, 1807, Ferdinand Hassler, a Swiss engineer, was appointed Superintendent of the new Bureau, which was placed in the Treasury Department, but actual work was not begun until a much later date. The first chart published by the Survey was of Newark Bay, New Jersey, in 1839.

Reliable charts can be made only from accurate surveys. From the very beginning, Hassler insisted that all the coast and harbor surveys be controlled by land observations that would knit together the surveys and charts of one locality with the surveys and charts of other localities. And this tradition of accuracy has been steadfastly maintained throughout the years.

The Survey's nautical charts are based upon its own field surveys, supplemented by data from other Federal organizations. The scales of the charts range from 1:2,500 to about 1:5,000,000.

Sailing charts, with scales of 1:600,000 and smaller, are used in fixing the mariner's position as he approaches the coast from the open sea, or for sailing between widely-separated coastwise ports. On such charts the shoreline and topography are generalized and only offshore soundings, the principal lights, outer buoys, and landmarks visible at considerable distances are shown.

General charts, with scales of 1:100,000 to 1:600,000, are for coastwise navigation outside outlying reefs and shoals. Coast charts, with scales of 1:50,000 to 1:100,000, are for inshore navigation leading to bays and harbors of considerable width, and for navigating large inland waterways. Harbor charts, with scales larger than 1:50,000, are for harbors, anchorage areas, and the smaller waterways. Intracoastal Waterway (inside route) charts, with a scale of 1:40,000, are a special series covering the inside route in New Jersey, the route from Norfolk, Va., to Key West, Fla., on the Atlantic coast, and from Key West, Fla., to the Mexican boundary on the Gulf coast.

USE LARGE-SCALE CHARTS

It is obvious that dangers to navigation cannot be shown with the same amount of detail on small-scale charts as on those of larger scale; in approaching the land or dangerous banks, therefore, the largest-scale chart available should be used. A small error in laying down a position means only yards on a large-scale chart, but on a small scale the same amount of displacement means large fractions of a mile.

A new edition of a chart is printed only when corrections are so extensive or of such importance to navigation as to necessitate a replacement of all previous issues; the number and

419650—57——2

date of the current edition are printed in the lower left corner. When the edition is revised, the date of the latest revision is printed to the right of the edition date. Before a chart is issued by the Coast and Geodetic Survey, it is corrected by hand for all important information published in the weekly Notice to Mariners since the date of printing; the number and date of the last Notice to Mariners used are stamped in the lower right corner. Navigators should consult the Notice to Mariners for corrections subsequent to the stamped date.

The Mercator projection, used on most nautical charts, has straight-line meridians and parallels that intersect at right angles. On any particular chart the distances between meridians are equal throughout, but distances between parallels increase progressively from the equator toward the poles, so that a straight line between any two points is a rhumb line. This unique property of the Mercator projection is one of the main reasons why it is preferred by the mariner.

It should be pointed out, however, that a great circle—the shortest distance between two points on the surface of the earth—becomes a curved line on the projection. This means that radio bearings, which follow the paths of great circles, cannot be plotted as straight lines on a Mercator chart without correction.

HYDROGRAPHIC ADVANCES

The advances made in hydrographic surveying since World War I have greatly increased the usefulness of the nautical chart. The older methods of sounding—the hand lead for shoal water and the wire machine for deep water—have given way to the echo soundings of the fathometer. Similarly, dead reckoning and celestial observations for position determination have been largely replaced by Loran and the Electronic Position Indicator. The electronic surveying methods are steadily pushing seaward the frontiers of accurate hydrographic surveys, thus adding to the safety of life and property at sea.

With fathometers standard equipment on most of the larger commercial vessels, the Coast and Geodetic Survey has been giving special prominence to depth curves on nautical charts. Deep-water submarine relief has become important to the navigator, and the more faithfully the chart depicts this relief, the closer the navigator can relate his fathometer readings to the chart. The expression, "On soundings," originally defined as, "to be within the 100-fathom curve," has assumed a much wider meaning. The older charts showed many soundings and few depth curves; the newer charts show more depth curves and fewer soundings.

Most of the various types of fathometers are calibrated for a velocity of sound in water of 800 fathoms per second, but the actual velocity may differ from the calibrated value by as much as 5 percent, depending upon the temperature and salinity of the waters in which the vessel is operating; the highest velocities are found in warm, highly saline water, and the lowest in icy, fresh water. Variation in line voltage can also cause errors of 10 percent or more in readings of the fathometer. Echoes can be obtained from schools of fish; in fact, trawlers are using the fathometer for that purpose. The most serious error in reading the fathometer commonly occurs where the depth is greater than the scale range of the instrument; a 400-fathom scale indicates 15 fathoms visually and graphically when the depth is 415 fathoms. Where possible, wide variations from charted depths should be checked by wire soundings.

The nautical chart of today has kept pace with scientific and engineering development. The electronic aids to navigation threaten to eclipse some of the old standbys; already, some of the tallest lighthouses have been darkened and many of the fog signals have been stilled. But it is unlikely that electronics will replace the basic navigational aid—the nautical chart—in the foreseeable future.

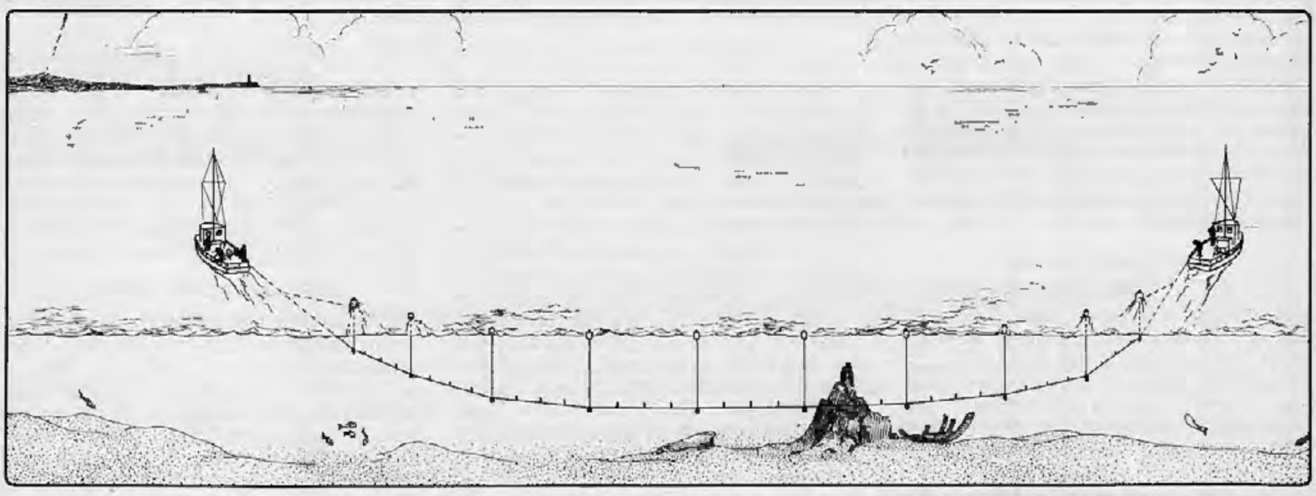


Photo Courtesy U. S. Coast and Geodetic Survey

OPERATION of wire-drag equipment is depicted in this drawing. Equipment consists of weights, floats, and cables to assure all underwater obstructions are properly charted. This operation is extremely important in rocky areas such as the New England coast, Alaska, and coral reef areas.

MSTS HAS LOWERED RATES

By Donald Nagle

Safety Engineer, Military Sea Transportation Service, USN

Marine transportation is the third most accident-plagued industry in America. The payoff on maritime accidents is the tremendously high insurance premiums shipping companies must put out to cover their liabilities for accidents.

In The Military Sea Transportation Service of the U. S. Navy, however, a thorough marine safety program with emphasis on preventive measures is considered to be a sound marine insurance plan. This policy has proven its worth—in the past five years *MSTS* has reduced its accident rate from 5.83 to 3.17, a reduction of 45 percent.

Emphasis on safety has been so effective that *MSTS* now ranks with the safety-minded chemical industry rather than with the rest of marine transportation. This proves that an aggressive safety program can bring results; that ships can be, despite statistics, a fairly safe place to work.

What is the reason for *MSTS*'s safety record? Full integration from start to finish. It even touches the life of an *MSTS* seaman before he joins a crew. Before a seaman is hired, a complete check is made of his work history. Through an indexing service, each *MSTS* command receives a complete listing of the man's previous employers; the types of injuries, if any, he has incurred; the number of claims he has filed; as well as other factors which bear on his desirability as an employee.

If the individual has a record which indicates that he is an easy fall guy for shipboard accidents, or a "claimer" (claiming an abundance of injuries in the past)—then the safety engineer recommends that the man not be hired. By "weeding out" such undesirables, *MSTS* reduces its accident potential at the start—the susceptibility factor is greatly reduced in the overall accident picture.

Just as the susceptibility factor plays such a big role in the prevention of accidents, safety education plays an equally important role in the elimination of accidents. An early and thorough exposure of the new employee to the *MSTS* safety program—plus a constant safety-training program contributes highly toward the elimination of accidents. The safety organization and programs are aimed at attaining a constant accident prevention tempo aboard *MSTS* ships. Lifeboat training and damage control training is aimed at making the *MSTS* seamen experts in safety-at-sea. The organization of safety councils aboard ship assures that every crew member in the ship knows what safety means to him and gives him a chance to voice his ideas on improvements which can be made to reduce accidents.

Shore support for the ships is one of the keystones in the ships' safety structure. In the alteration of ships, the *MSTS* engineering operations ashore work in close cooperation with the safety staff in integrating safety features into new designs, alterations, etc. Many of the changes made in the ship had their beginnings aboard ship in various safety meetings. Other changes result from formal inspection teams which regularly inspect the ship from stem to stern and record material and operation deficiencies. A formal followup program is maintained on each deficiency until satisfactory action on it has been completed.

Another facet of the overall safety which is given close attention is the accident analysis program. The thoroughness of the accident analysis program is perhaps best illustrated by what is called in *MSTS* circles the *"Saga of the Salted-Peanut Can."*

Maybe you have noticed that a major peanut company has changed the design of its peanut cans and now advertises the can as having a "coaster top." This was the result of accident analysis at work. *MSTS* ships carry troops—troops seem to have a passion for peanuts—they consume a tremendous quantity of canned peanuts on any one voyage, so much, in fact, canned peanuts is the overall best seller item carried in the ship's exchange. After eating the peanuts, however, the troops have a habit of using the lid and can as make-shift ash trays by pressing them into the desired shape with their hands. Result, any number of hand lacerations. However, after some thorough investigation and many conferences with this company, a new can was designed with rolled edges. Result—almost complete elimination of hand accidents.

Actually, accidents are prevented and safe practices fostered in a great many ways, none of which is basically new in the accident prevention field. The important concept maintained in *MSTS* is, however, not a group of numbers on a piece of paper, a statistic, a record of one command against another—but the one objective—prevent accidents. No accident rate is ever so low that it cannot be improved.

Courtesy Safety Review

INLAND SAFETY MEETINGS

Increased interest in the promotion of river safety is evidenced by the formation of an Inland Waterways Safety and Health Committee to consider problems inherent to the inland river transportation field.

The membership consists, essentially, of various river shipping companies with invited guests from marine insurance agencies, labor unions, and Coast Guard. Meetings are held at least every three months with a temporary chairman spearheading the selected safety subjects.

At a recent meeting held in St. Louis, Missouri, a discussion was held on safety meetings aboard boats, pre-employment physical examinations, use of safety shoes, personal injury reports, and concluded with a talk and demonstration on the cause of fires and means of preventing them.

It was pointed out that the highest percent of personal injuries result when men are handling rigging in the river trade. In the prevention of falls on towboats and barges, the use of nonskid treads and paint were reported by operators using this material.

Emphasis on pre-employment physical examinations was stressed due to the hazards not known to other industries. Employees are required to be exposed to extreme weather conditions, to lift weights up to 100 pounds, to climb, to jump, and walk where there may be exposure to falling in barges or in the river. It was shown that the safety of the individual, as well as his shipmates, could be determined by his physical condition and mental alertness.

The next quarterly meeting is tentatively scheduled for this month with L. P. Stone, Union Barge Line, acting as chairman.

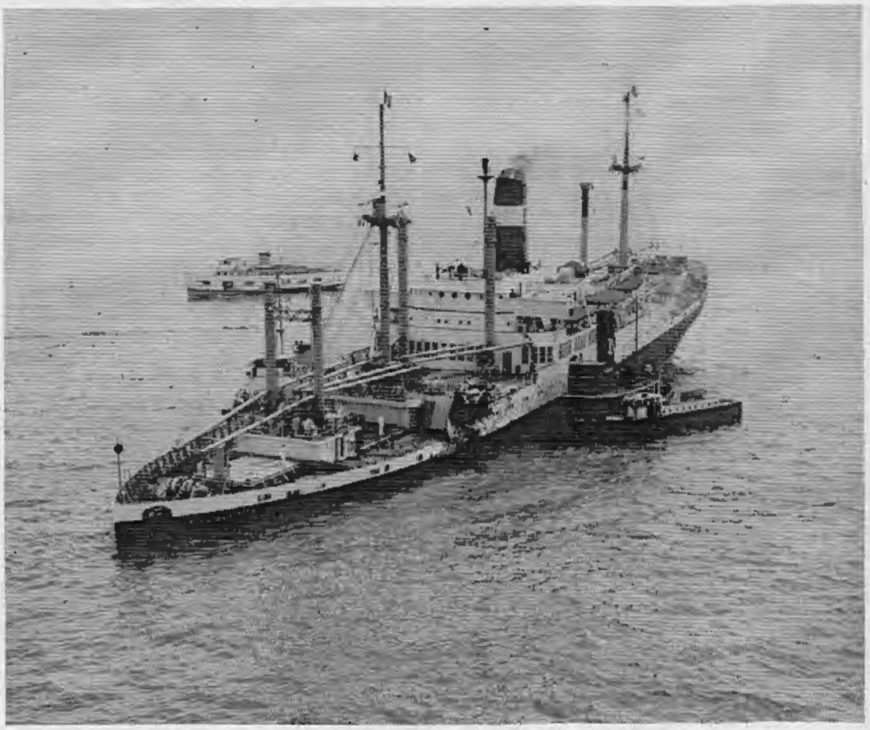
SEAMANSHIP—PRUDENCE—RULES OF THE ROAD

UNCERTAINTY, confusion, and speed were the contributing factors to a collision that teetered on the brink of disaster between a crack American flag cruise ship and a foreign freighter is a case recently decided in U. S. Court of Appeals, Second Circuit.

Ability of the passenger ship to beach herself without loss of life or serious injury to her 114 passengers and crew, with a 35 x 38 foot hole gashed in her side from main deck to turn of bilge, prevented a catastrophe.

In the libel in admiralty by Det Forenede Dampshibs-Selskab, A. S., owner of the MV *Colombia*, against the SS *Excalibur* and her owner, the American Export Lines, the U. S. Court, Eastern District of New York, held the *Excalibur* solely responsible for the collision between the two vessels. The U. S. Court of Appeals affirmed the trial court (216 F. 2d 84).

Circuit Judge Harold R. Medina's entire opinion is quoted below as an excellent illustration of the necessity for prudent seamanship despite being under pilotage and in sheltered waters.



BEACHED: Shortly after the collision the SS *Excalibur* was put ashore on Bay Ridge Flats where she stayed for 10 days preparing for shift to a nearby New York shipyard.

COURT'S OPINION

"The collision occurred on an ebb tide of two knots in the early afternoon of a clear summer day, under ideal weather conditions, and without the presence of interfering traffic, on the easterly side of the Main Ship Channel leading from the Narrows to New York Harbor, a short distance northwest of the Bay Ridge Channel Junction Buoy.

"The *Colombia*, a cargo vessel carrying a few passengers, was inbound from Philadelphia, and the *Excalibur*, a combination passenger and cargo vessel, with 114 passengers aboard, was leaving for Mediterranean ports. Each was a large vessel, the *Colombia* about 416 feet long, of 5146 gross tons and the *Excalibur* 452 feet, with a gross tonnage of 9644. As they sighted one another at a distance of three miles, each was on the starboard side of the channel proceeding at full speed or an aggregate of 24 nautical miles an hour over the ground.

"The version of the sequence of events as given by those on board the *Excalibur* is so fantastic and in such conflict with the probabilities and established facts that we shall pass it over. The real question is whether the *Colombia* also was at fault.

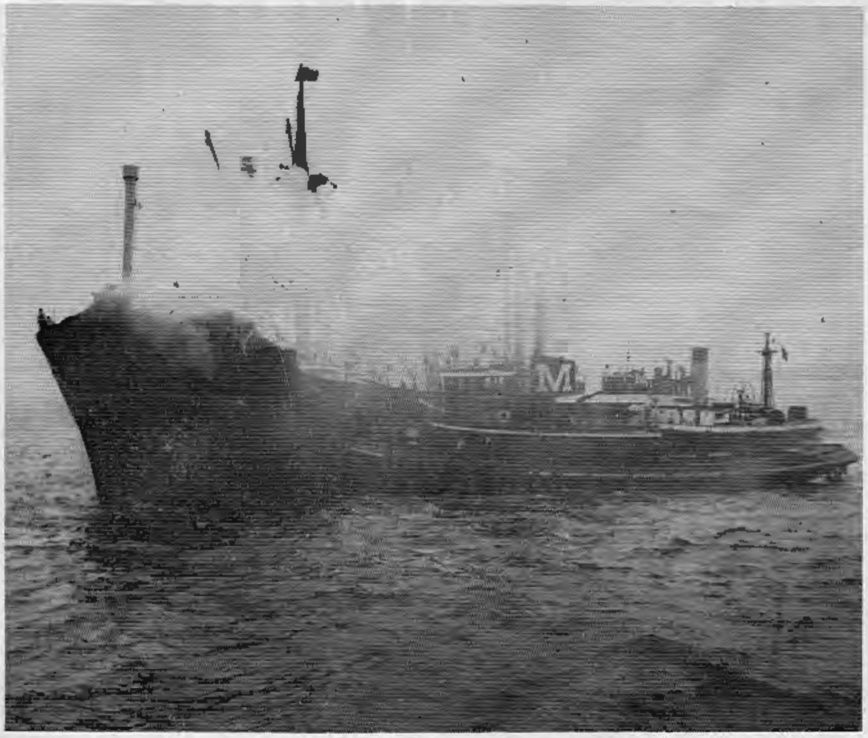
"The preliminary movements of the two vessels are pretty well established. At all times the *Colombia* was on the easterly side of the channel where she belonged. But the *Excalibur*, when she reached a point abeam of Robbins Reef, swung to port and crossed over to the Brooklyn side of the channel so that her captain might wave to his wife as he went by. As the Narrow Channel Rule, Article 25, Inland Rules, 33 U. S. C. A. § 210, was applicable to this main and often crowded artery of traffic in and out of New York Harbor, the *Excalibur* should have held to starboard as the usual course was unquestionably safe and practicable. This was a statutory fault, as held by the trial judge, and it remains such even though the course to port, under such circumstances as here obtained, might seemingly be carried out in safety. One who deviates from the rules must take, at least to some extent, the risk of subsequent events.

NO STEAM FEATHER

"Having changed her course the *Excalibur* sounded two blasts for a starboard to starboard passing and the *Colombia* responded. As she was diesel-powered, the usual white feather of steam did not appear at her funnel head, but the responsive two blasts were nonetheless given. As the windows on the deckhouse of the *Excalibur* were closed, the signals from the *Colombia* were not heard. Accordingly, in compliance with Article 18, Rule III, 33 U. S. C. A. § 203, the *Excalibur* should have immediately sounded the danger signal of not less than four short and rapid blasts; but she did not. This was a serious delinquency at a critical moment and set the stage for what followed.

"The *Colombia* in response to the agreement on a starboard to starboard passing changed her course to port. As the *Colombia* responded to this change of course the vessels continued at full speed ahead and were in close proximity of one another, with every prospect of a safe starboard to starboard passing.

"Then came the final and disastrous step in the series of errors committed by the *Excalibur*. Probably because of the confusion resulting from what those in the wheelhouse of the *Excalibur* must have considered a failure



RESCUE CRAFT: Gathered around the MV *Colombia* are commercial tugs and Coast Guard cutters fighting fire after collision with SS *Excalibur*.

of the *Colombia* to respond to the two blast call for a starboard to starboard passing, all of which might readily have been dispelled by a compliance with Article 18, Rule III, and in some measure due also to inattention or faulty observation, the *Excalibur* decided to get back on the starboard side of the channel, or at least to mid channel, and sounded one blast, calling for a complete reversal of the course previously agreed upon. Not only this, but even before giving this signal, she already had changed her course to starboard. This was established by the testimony of several witnesses. Thus, on a set of facts scarcely open to any serious dispute, we find the two vessels turning in the same direction, with the *Excalibur* headed for a position immediately in the path of the *Colombia;* neither had settled on a course straight ahead.

SERIOUS CONTROVERSY

"Aside from speculations and expressions of mental operations concerning what might or might not have happened, and the reasons for doing this or that, we now enter the area of serious controversy. The distance between the two vessels when the *Excalibur* switched her signals is in dispute. We think the evidence amply supports the finding of the trial judge that the single blast was sounded when only a half a mile separated the two ships. At the speed with which they were approaching one another this distance would be traversed in something like seventy-five seconds. The trial judge found that this final change of course and the giving of the one blast call for a port to port passing placed the vessels 'almost in extremis.' We find that there was no 'almost' about it; the vessels then were in extremis.

"The principal contentions of the *Excalibur* are based upon what the *Colombia* did in the brief interval of time just prior to the collision. The pilot of the *Colombia* who had observed the *Excalibur* swinging to starboard before the change of signals, responded with one blast from his whistle, ordered the wheel hard astarboard, rang the engines full speed astern, gave the danger signal, followed by three blasts, the regulation backing signal. These actions followed one another in rapid sequence. They were all part of a single effort to avoid a collision, in the vain hope that the vessels might slide by one another, port to port. The claim that the giving of the single blast was a fault under these circumstances is completely unwarranted. The pilot testified that he did not see what else he could do; and we agree with him.

COLLISION IMMINENT

"As said by Judge Learned Hand in *City of New York* v. *American Export Lines*, 2 Cir., 1942, 131 F. 2d 902, 905: '* * * "it was in no sense an 'acceptance' of the 'Coney Island's' proposal; it was forced upon her willy-nilly by conduct which as we shall show was utterly unjustified." '

"Just as the *Excalibur* sounded the single blast above referred to the master of the *Colombia* was coming through the chart room, immediately aft of the wheelhouse. He saw that the *Colombia* was still swinging to port as the change of helm and the reversing of her engines had necessarily done no more than reduce the effect of the port helm previously in force; he could see that a collision was imminent as the *Excalibur* was then across his bow; he observed where the engine room and the passenger quarters of the *Excalibur* were located; and he ordered the second officer up to man the anchor and directed the quartermaster to hard aport. This probably averted a major disaster as the bow of the *Colombia*, a few seconds later, struck the *Excalibur* just forward of the passenger quarters. Incidentally, some notion of the confusion aboard the *Excalibur* may be derived from the undisputed fact that at the time of the collision the *Excalibur* was still proceeding at full speed and the vessels came together at an angle of seventy degrees.

"Whenever a master takes charge while a pilot is at his task, the claim is made that he is at fault in doing so; but it is safe to say that seldom if ever was the claim so lacking in substance as it is here. We agree with the trial judge who found that what the master did was not only not a fault but rather the act 'of a careful and intelligent master' in the performance of his duty. But, had it been otherwise, a mere error of judgment in such an emergency would have been of no avail to the *Excalibur*.

"Finally, in an endeavor to cast some doubt upon the master's testimony, which was credited by the trial judge, appellants say that the time interval and hence the distance between the two vessels was greater, because it was physically impossible for the second officer to make his way up to the bow in so short a time. But a man moves fast when his ship is about to hit another vessel amidships and this was but one of the many attendant circumstances which in the aggregate it was the duty of the trial court to consider.

"We are satisfied that he disregarded none of the proofs adduced before him and that the record presents no substantial error.

"Affirmed."

PLOT—FOR SAFETY

By Captain L. M. Thayer, USCG

THERE is little doubt that most of our ships' officers fail to make a plot of radar information. The reasons may be that they have found the concept of relative movement too elusive, and they have not had proper instruction. They navigate, however, even though they are not entirely proficient in the spherical trigonometry involved. In the same way, they could plot radar information even though they might not fully understand relative motion.

The eight steps listed below refer to the example on the facing page. If you follow them you can make a practical, usable plot of your radar information.

1. After you have set your course and speed at sea, plot them to scale on the maneuvering board. In the diagram, the course is 000 degrees true, speed 15 knots; and they are represented by the arrow e—g. In this case, 1 space on the maneuvering board equals 2 knots.

2. When you get a pip, start a stop watch, and then record: (a) the ship's time (4 figures); (b) the target's true bearing; and (c) the range in miles and tenths. On the diagram, the first reading was taken at 1100, at which time the bearing was 012 degrees true, and the range was 10.0 miles. The scale used is 1 space equals 1 mile. In regard to selecting a scale: If the first range is between 10 and 20 miles, let 1 space equal 2 miles; if it is 10 miles or less, let 1 space equal 1 mile.

NOTE: The scale you use to represent speed in knots, and the one you select to represent range in miles are independent of each other. You might just as well have used 1 inch to represent 2 knots, and 1 centimeter to represent 1 mile; but you use *spaces* on the maneuvering board because they are more convenient. The only thought to remember is that all plots involving speeds must be made to the same scale; and all plots involving distances must be made to a common scale.

3. After 3 minutes by stop watch, take, record, and plot another reading; label it 03. Repeat after another 3 minutes, and label it 06.

4. Fair a line *carefully* through the three points just plotted, and extend it beyond the center of the board. This is the *Relative Movement Line—RML.* It is the line 1100—a, in the diagram.

5. Measure the distance between the point at 1100 and at 06; multiply the distance by 10. The product is the *Relative Speed.* (The distance in the diagram is 1.2 miles, the relative distance the target has moved in 6 minutes; and since 6 minutes is 1/10 hour, the relative speed equals 1.2×10, or 12 knots).

6. From *g* draw a line parallel to *RML*, in the direction of the relative movement, and long enough to represent the relative speed to scale. Label the end of the line *m*.

7. Draw a straight line between *e* and *m*. *This* line, e—m, represents (a) the true course of the target, 311 degrees in the diagram, and the speed of the target, 5.6 knots in the diagram.

8. Draw a line from *e* at right angles to *RML*. Where the line (e—x in the diagram) cuts the *RML* is the target's closest point of approach to you, provided there is no change in course or speed by either vessel. The closest point in the example is 1.4 miles on bearing 290 degrees true.

It is that easy. This is the basis of solution to all plotting problems, even though some of them are more involved. Surely anyone qualified to be in charge of a watch can do it. The practical value of it is this: You continue to take, record, and plot radar readings; and as long as both vessels proceed without a change in course or speed or both, all readings will plot along the *RML*, ((b) and (c) in the diagram). Conversely, if you hold your course and speed, and the readings *do not* plot on the *RML*, you may be sure that the target has made a change; and you will know quickly, from your plot, what the change has been. Assume, however, that the points plot along the *RML:* You can predict, then, in the example, that the target will pass ahead of you 4 miles, and that he will be 1.4 miles from you when he bears 290 degrees true. Suppose now that you decide to give him a wider berth, by changing your course. It is obvious from your plot that you should change to the right and not left. Another practical value of the plot is that if your bearing does not change as the range closes, you know you are on a collision course. If you *already* know the course and speed of the target, you will be able to make a seamanlike change *before* the situation becomes an emergency. Unfortunately the records of collision cases reveal clearly that maneuvers, designed to avert collision, but based upon unplotted radar information, are apt to be pure guess work.

Without solving for the target's course and speed in the example, many mariners—perhaps the vast majority of them—would have concluded that the target was coming toward them. That is, they would have thought the vessel to be on some course such as 200 degrees true, and, to avoid a dangerous situation, they would have "come left a little." And this is how collisions are born.

Pride in his profession should demand that every deck officer know how to plot radar information. But, and perhaps ever more demanding is the fact that the courts have made this decision in regard to collision cases: A vessel is at fault if she fails to make proper interpretation of radar information. Proper interpretation results from the use and understanding of a plot.

ABOUT THE AUTHOR:

A 1933 graduate of the U. S. Coast Guard Academy, Captain Thayer has been assigned as Officer in Charge, Marine Inspection, in Portland, Oregon, since December 1953. This article is excerpted from Captain Thayer's new treatise entitled "Practical Radar Plotting."

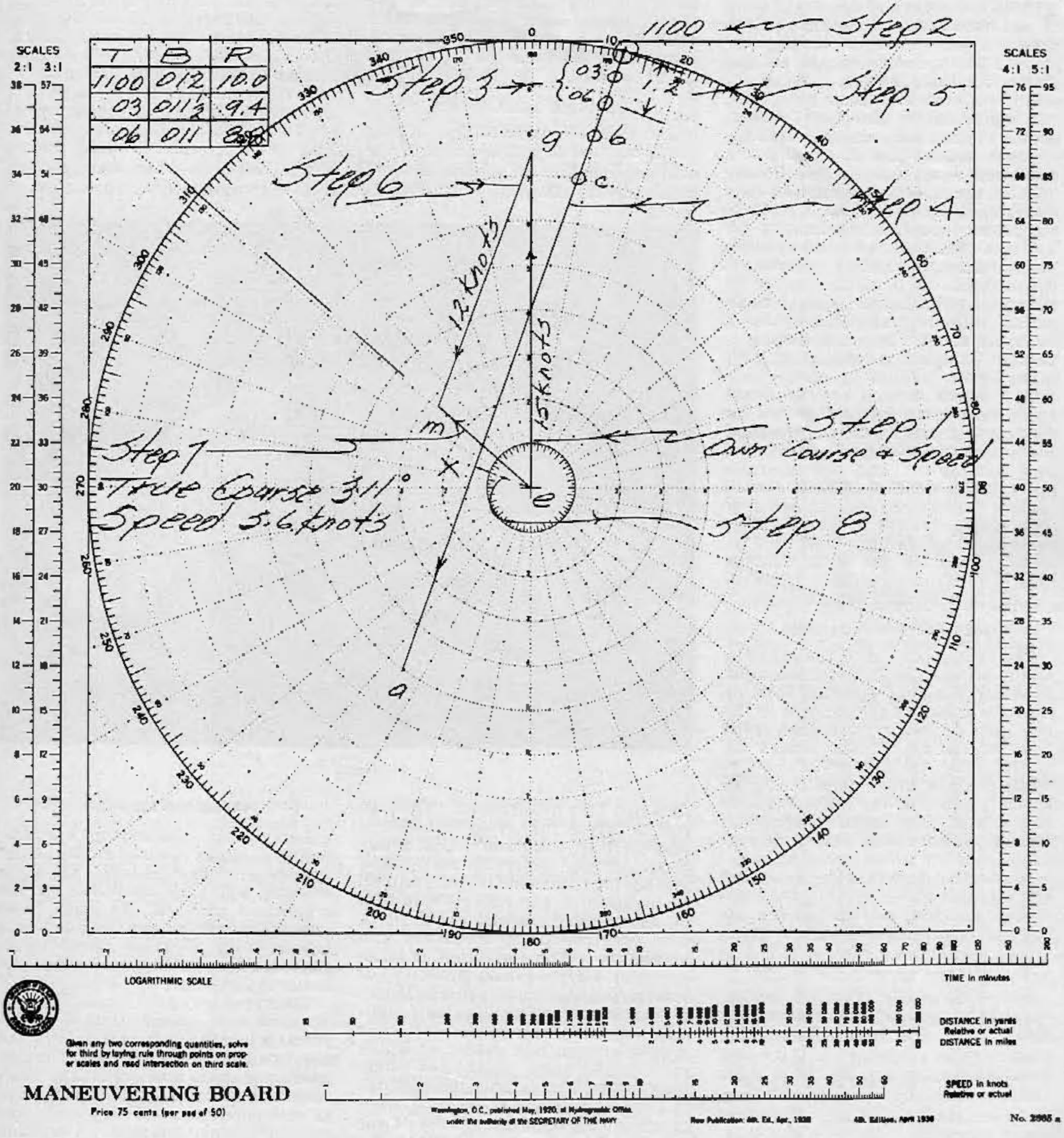
RECORD SMASHER

Chalking up records in almost every department, the SS *United States* recently completed her 100th round-trip between the United States and Europe.

On July 3, 1952, she smashed the North Atlantic speed record with a 3-day, 10-hour and 40-minute crossing between Ambrose Lightship and

Bishops Rock for an average of 35.5 knots. On the return crossing to New York she made the distance in 3 days, 12 hours, and 12 minutes for a westbound entry in the record books.

The ship has carried 312,878 passengers during the first 4½ years of service and has traveled approximately 637,824 miles between lightships—almost 26 times around the earth—at the remarkable average speed of 30.64 knots.


T | B | R
1100 | 012 | 10.0
03 | 011½ | 9.4
06 | 011 | 8.8
1100 ← Step 2
Step 3 → {03, 06}
1.2
Step 5
g
b
c
Step 6
Step 4
12 Knots
15 Knots
m
Step 1
Step 1
Own Course + Speed
True Course 311°
Speed 5.6 knots
e
Step 8
a
SCALES
2:1 3:1
4:1 5:1
LOGARITHMIC SCALE
TIME in minutes
DISTANCE in yards Relative or actual
DISTANCE in miles
SPEED in knots Relative or actual
Given any two corresponding quantities, solve for third by laying rule through points on proper scales and read intersection on third scale.
MANEUVERING BOARD
Price 75 cents (per pad of 50)

SCOTCH BOILERS

By E. G. Johnson and William E. Zimmie

VARIOUS types and designs of boilers have been successfully applied to marine service. However, this paper will be limited to Scotch Marine Boilers for the following reasons. A significant number of these boilers are still operating on the Great Lakes. Scotch Marine Boilers are, in general, of much greater age than the newly developed water tube types. Consequently much less information was available from boiler manufacturers on proper operating techniques as well as maintenance and repair. Furthermore, technical literature, which embraces a further source of valuable information, has dealt mainly with the water tube types.

Scotch Marine Boilers are characterized by their reliability of performance as well as by their durability. Many serving on the Great Lakes have given faithful service for 50 years or more. These qualities can be enhanced by careful control of water treatment and by adequate operating procedures. While Scotch Marine Boilers are not as easily or as quickly sensitive to conditions of service, metal failures can and do occur. Probably the most common type of failure encountered is cracking of the corrosion fatigue type.

OCCURRENCE OF CRACKING

The major portion of the cracking occurs in certain favored locations. Probably the most common location is at the throat of the furnace or the first one or two corrugations away from the throat. These cracks are on the water side and are of the corrosion fatigue type. The mouth or visible portion of the crack becomes enlarged so that small grooves are formed. Hence this attack is frequently called water grooving.

Another favored location is at and around horse collar rivets on the combustion chamber side and at the upper portion of the horse collar. These cracks originate on the fire side and are, therefore, termed fire cracks.

Corrosion fatigue cracking also occurs at the combustion chamber back head or at the boiler back head. These cracks originate on the water side and usually run out from staybolts so that the configuration may be called spider webbing. Occasionally the cracking occurs in the staybolts themselves.

Another area where cracks have been found is around the lower knuckles of the front head. These cracks are on the water side and normally take the form of water grooving. *Figure 1* shows a case of water grooving in a section taken from a corrugation adjacent to the throat of the furnace.

CRACKING MECHANISMS

The term corrosion fatigue implies the formation of cracks through the combined action of corrosion and cyclic stress. However, the term is used in a very broad sense. The corrosion factor may vary between a very corrosive condition to that where good corrosion control is maintained and the only corrosion is that required to maintain a protective oxide film on the metal. Likewise cyclic stress may vary greatly in frequency and magnitude. The formation of most corrosion fatigue cracks probably involves the following two mechanisms:

1. The metal surface may be roughened or pitted by corrosion with the depressions or pits acting as stress raisers. At these points the stress may exceed the fatigue limit, which is the lowest stress at which fatigue cracking can occur regardless of the number of stress cycles. This mechanism is most common where significant, nonuniform, corrosion has occurred and especially where relatively deep and steep-walled pits have been formed.
2. The crack may be the result of the progressive fracture of successively-formed, protective, oxide films through cyclic stresses. The oxide film is broken initially by stress so that fresh metal is left open to further attack and new protective oxides are formed at the base of the crack. This new oxide film is again broken and, as this process continues, a crack of the corrosion fatigue type is formed.

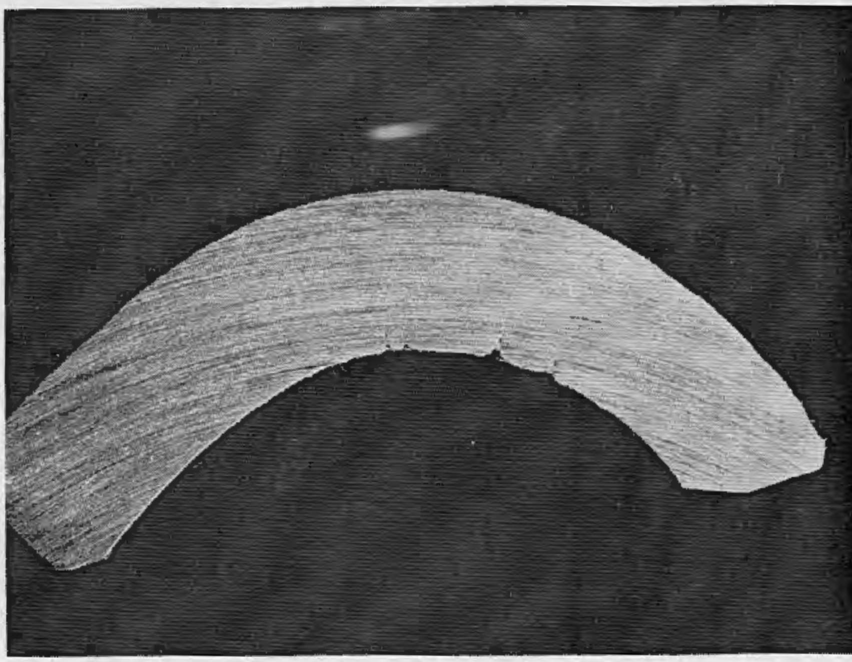


Figure 1.

NATURE OF CRACKING

Many boiler components are subjected to cyclic stresses during boiler operation. The nature of these stresses will vary according to the conditions involved. In some cases stress fluctuations are frequent and severe, while in others rather infrequent and occurring only when the boiler is heated up or cooled.

Microscopic examination of the polished and etched surface of the metal is invaluable in determining the service history of the metal. The frequency of stress application and magnitude of stress, as well as the scope of the corrosion, will determine the configuration of the crack. Corrosion fatigue cracking is transgranular in nature, that is, the cracks pass through the grains of the steel rather than around them. The direction of the cracking is dictated by stress.

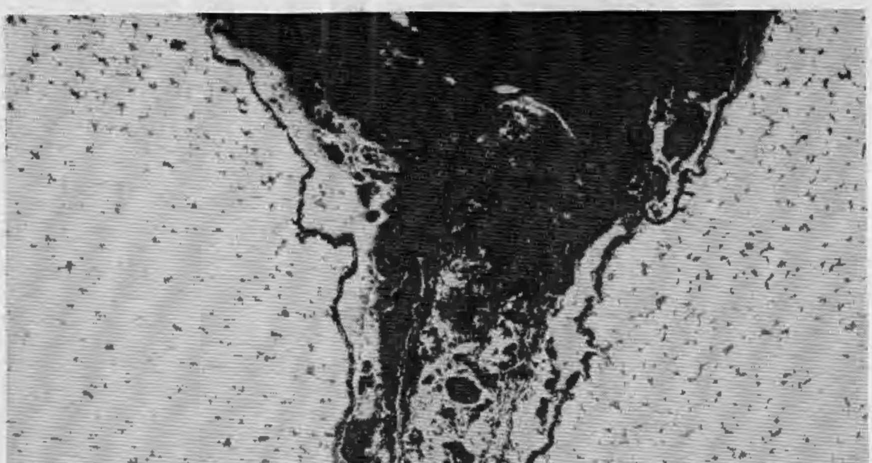


Figure 2.

Corrosion fatigue cracks are usually quite thick as compared to ordinary fatigue cracks. However, with stress frequency and magnitude quite high and the corrosion factor low, relatively thin, fine, cracks are produced. Conversely, when stress frequency is low and corrosion the dominant factor, the cracks are broad. Such a crack is shown in *Figure 2*. This is sometimes called cracking of the low frequency corrosion fatigue type. A more narrow corrosion fatigue crack found in a Scotch Marine Boiler is shown in *Figure 3*. It will be noted that this crack has a somewhat enlarged but rounded end. This feature has been interpreted by some investigators as indicating that further propagation of the crack is unlikely. Corrosion fatigue cracking has accounted for a significant portion of the failures encountered in Scotch Marine Boilers on lake boats. The pattern of cracking follows, quite closely, that previously described as mechanism No. 1. It is therefore important to assess the extent to which corrosion and stress contribute to the failures.

ROLE OF CORROSION

The cracks are often of the low frequency type where corrosion has played a dominant role. In fact, some of the cracks are so broad that they appear to be merely extended corrosion pits. This corrosion, most probably, was facilitated by practices used in the past. Most of the Scotch Marine Boilers are of considerable age and were operated, during a portion of their life, when water treatment was in a lower state of development or was not used at all. Under these conditions, much greater corrosion would be expected.

ROLE OF STRESSES

Many of the waterside cracks indicate very low frequency of stress application such as might result from boiler start-ups or shut-downs, the stresses becoming more damaging when the boiler is started up or shut down too rapidly. The stresses at any point are probably very complex due to the influence of the various components. Consequently the calculation of such stresses would be difficult. However, when boilers are started up or shut down too rapidly, greater gradations in temperature between various boiler components and correspondingly greater stresses are involved. Accordingly, it is desirable to follow recommended procedures for starting up and shutting down boilers.

Other cracks show somewhat greater frequency of stress application. This may be attributed, in part, to the more frequent boiler washouts required in the past. Thermal variations coincident with operation may also be a contributing factor. The stress factor in causing the fire cracks near rivets in upper portion of horse collars is probably related to thermal changes involved in firing practices.

CAUSTIC EMBRITTLEMENT

Caustic embrittlement is a term commonly applied to a type of stress corrosion cracking of steel where the cracking is predominantly intergranular. The cracking occurs in areas where a high concentration of boiler water solids, including caustic, is formed on a steel surface which is under a high, static, tensile, stress. The boiler water concentrate is normally formed on the dry side of the sheet by leakage of boiler water at a seam or rolled tube end and by subsequent evaporation. The metal cracks rather than becoming brittle so that a more appropriate term for this attack is caustic cracking.

This type of attack has always been given much more consideration and emphasis than is justified by the number of such failures encountered. In fact, in recent years, failures of this type have been rare and never have they occurred as frequently as corrosion fatigue cracks. However, due to the publicity given to embrittlement failures it has even been suggested that the water grooving in Scotch Marine Boilers was caused by caustic embrittlement. This is unlikely for the following reasons:

1. Water grooving occurs on the water side of the metal while caustic embrittlement, by its very nature, normally originates on the dry side.
2. Microscopic examination shows water grooving to be caused by thick,

transgranular cracks of the corrosion fatigue type. Embrittlement cracks originate and propagate as fine intergranular cracks.

3. Cracks from water grooving show very little tendency toward branching while embrittlement cracks are very apt to branch.

4. Water grooving occurs where a favorable combination of corrosion and cyclic stress are present. Embrittlement is largely confined to areas where leakage can occur and under conditions of static stress.

CONCLUSIONS

1. A large percentage of failures in Scotch Marine Boilers on lake boats is caused by cracking of the corrosion fatigue type.

2. In general, corrosion is the dominant factor with much of the corrosion likely occurring during earlier operation without adequate water treatment control.

3. Many of the cracks are thick in relation to their length, probably indicating low frequency of stress application. These stresses, therefore, are probably associated with boiler start-up and shut-down practices.

4. The cracking observed in Scotch Marine Boilers is frequently called water grooving. These cracks are of the corrosion fatigue type and could not be caused by caustic embrittlement.

The previous discussion tells where and how failures occur in Scotch boilers. The elimination of these failures can only come about by proper operating procedures. It has generally been agreed upon that long lengths of time are required to raise steam and to take a boiler off the line. The reasons for this were outlined in the previous discussion but should be elaborated upon.

In raising steam, it would be advantageous to start off with a small coal fire for at least 8 to 10 hours with no attempt made to actually produce steam. The purpose of this fire is to slowly equalize the temperature gradients within the boiler thereby reducing the effects of unequal expansion. The ideal way to bring a boiler up to heat would be to install a small pump of about 30 GPM capacity which would take its suction from the bottom of the boiler discharging it into the top of the boiler. This would reduce the water temperature gradients. Because of the small amount of circulation when beginning to raise steam, the bottom of the boiler can be actually cold while the water in the top of the boiler may begin to produce steam. The next 4 hours should be spent in slowly bringing about larger fires to produce the steam. The overall period should never be less than 12 hours and 14 would be better.

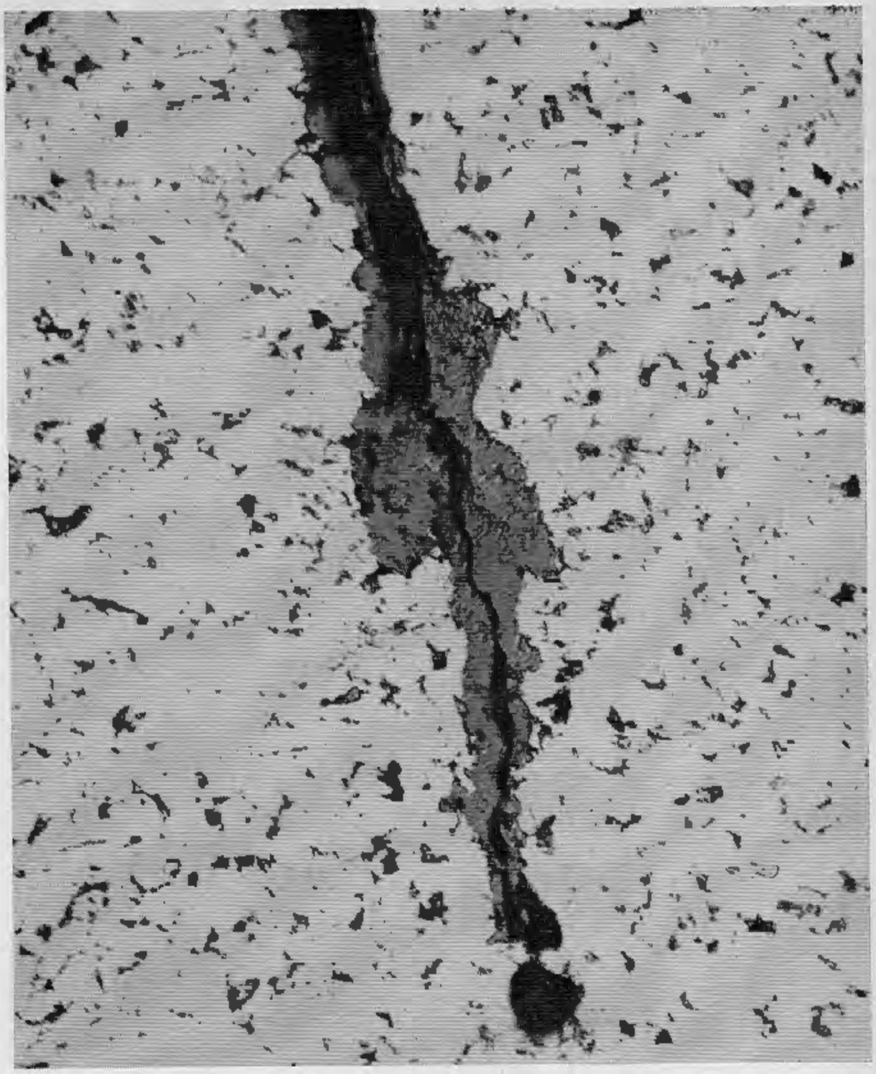


Figure 3.

In blowing off a boiler the most advantageous procedure would be to merely shut the steam stops, pull the fire and let the boiler cool naturally opening up the air crack when there is about 25 pounds. However, this would probably take 2 days to accomplish. The more practical way and which is the method that is probably followed by most people on the lakes, is to open the surface blow very slightly and continue the blowing off of the pressure. When supplying the necessary feed water to the boiler to make up for that which is blown overboard, it should always go through the feed water heater so that there is no shock effect due to the admission of cold water.

These instructions are simple and most easy to follow and it will make possible the use of existing Scotch boilers for the rest of the economic life of the vessel providing no gross deteriorated conditions exist at the present time.

In 1954 the Fleet Engineers' Committee of Lake Carriers' Association met to discuss possible repairs to Scotch boilers that have serious deteriorated conditions. In the past, it had been necessary to completely remove combustion chamber backheads (flame sheets) and external backheads because of the well-known condition of spider webbing. It was felt by the Fleet Engineers' Committee that because of the advancements made in welding, that it would be possible to remove deteriorated areas in the flat areas of these plates and weld in new plates and re-drill for the necessary staybolts. A subcommittee was formed to investigate this possibility and to contact the necessary consultants and develop an agenda which would outline to the Coast Guard the repair procedure. The Babcock & Wilcox Company of Barberton, Ohio, were kind enough to supply us with an expert welding engineer and their complete laboratory facilities to develop the repair procedure. The report of Babcock & Wilcox is enclosed in its entirety.

A joint meeting was held with the Coast Guard with Admiral Roy L. Raney, Commander C. F. Perry, Commander B. H. Harris, Commander Stanley Rovinsky, Commander B. J. Hennessey and other Coast Guard personnel directly concerned with boiler inspection. After the presentation, it was accepted as a valid repair without the necessity of stress relieving; however, it is necessary to completely radiograph the welded areas to insure both the Coast Guard and the owners that there are no inherent defects in the weldments. Also, it is necessary to submit to the Coast Guard a sketch showing the number and location of proposed inserts.

Other repairs are also possible in flat areas of the combustion chamber backheads and external backheads. It is also necessary to have these repairs approved prior to the actual work. The expression "flat areas" are used in this discussion because it is felt that a welded insert of this type could be put in at a reasonable cost, contrary to putting in the complete backhead where it is necessary to flange, fit, drill, and rivet which makes not only a costly repair but also one in which it is difficult to get a good fit which will remain tight.

There are certain areas on a boiler which make it impossible to cut out and insert weldments, these would be in the throat of the furnace at the first corrugation from the combustion chamber on the waterside, and at the knuckles of the external heads. At the present time, the only repair to these areas is renewal if the deteriorated area extends beyond the limit of welding which is explicitly spelled out in the Coast Guard regulations.

To summarize this section on Scotch boilers, it should be kept in mind that the best preventive maintenance is proper operating procedures.

KNOW YOUR CHEMICALS

One of the few cost publications put out by the Coast Guard is "Explosives or Other Dangerous Articles on Board Vessels" (CG–187)—which should be a part of every ship's library.

Modern industry steadily requires shipment of more general cargo susceptible to chemical reaction if wet, heated, or brought into contact with certain other cargo. Reference to this book should assist cargo mates and stevedore supervisors in laying out the stowage.

Sometimes the chemical composition of dangerous materials is covered by general nomenclature such as bleaching powder, detergent, solvent, and others with trade names equally unrevealing. Coast Guard and Interstate Commerce Commission regulations require shippers to mark dangerous shipments with colored labels as follows:

Red Label . . . For inflammable liquids, inflammable compressed gases, fireworks, explosive samples.
Yellow Label . . . For inflammable solids and oxidizing materials.
White Label . . . For acids, corrosive liquids.
Green Label . . . For non-inflammable gases.
Poison Label . . . For poisons.

But sometimes labels fall off, are destroyed, or overlooked. The basic responsibility for stowage of a ship rests squarely on the shoulders of the Master and his officers. The Coast Guard, the shippers, the dock force, the stevedores—all have their responsibilities for compliance with the law, but final responsibility for seaworthiness rests with the ship.

The law requires an accurate description of dangerous goods on the dangerous cargo manifest, unclouded by trade-name camouflage, but generally a manifest may not be seen by the ship's personnel until it is at sea. The stowage of dangerous cargoes is a real challenge to the ship's officers. They must find out what is going into the ship, how it is stowed, how protected. They should learn what extinguishing agents to use, and more important, what not to use if a fire breaks out.

Remember, if there is bad stowage your life may be jeopardized, as well as the lives of your shipmates.

This publication "Explosives or Other Dangerous Articles on Board Vessels" (CG–187) may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for $2.50. This includes changes made in the regulations since the date of the publication. Amendments to the Dangerous Cargo Regulations are normally made at unscheduled intervals during each year. At least two amendments occur during any calendar year. Copies of changes and additions subsequent to those received with the publication from the Superintendent of Documents may be received upon written request addressed to the Commandant (CHS), U. S. Coast Guard, 1300 E Street NW., Washington 25, D. C. The request should indicate the date of the last change received with the publication or the date of the last one received. Due to requirements affecting printing established by the Joint Committee on Printing of Congress it is not possible to establish a mailing list for the distribution of these changes.

EMERGENCY COMMUNICATIONS INSTRUCTIONS

AN Appendix issued to Notice to Mariners No. 1, January 5, 1957, includes emergency procedures and communication instructions for U. S. merchant ships to ensure a rapid and smooth transition from a peacetime status to that of war upon outbreak of hostilities.

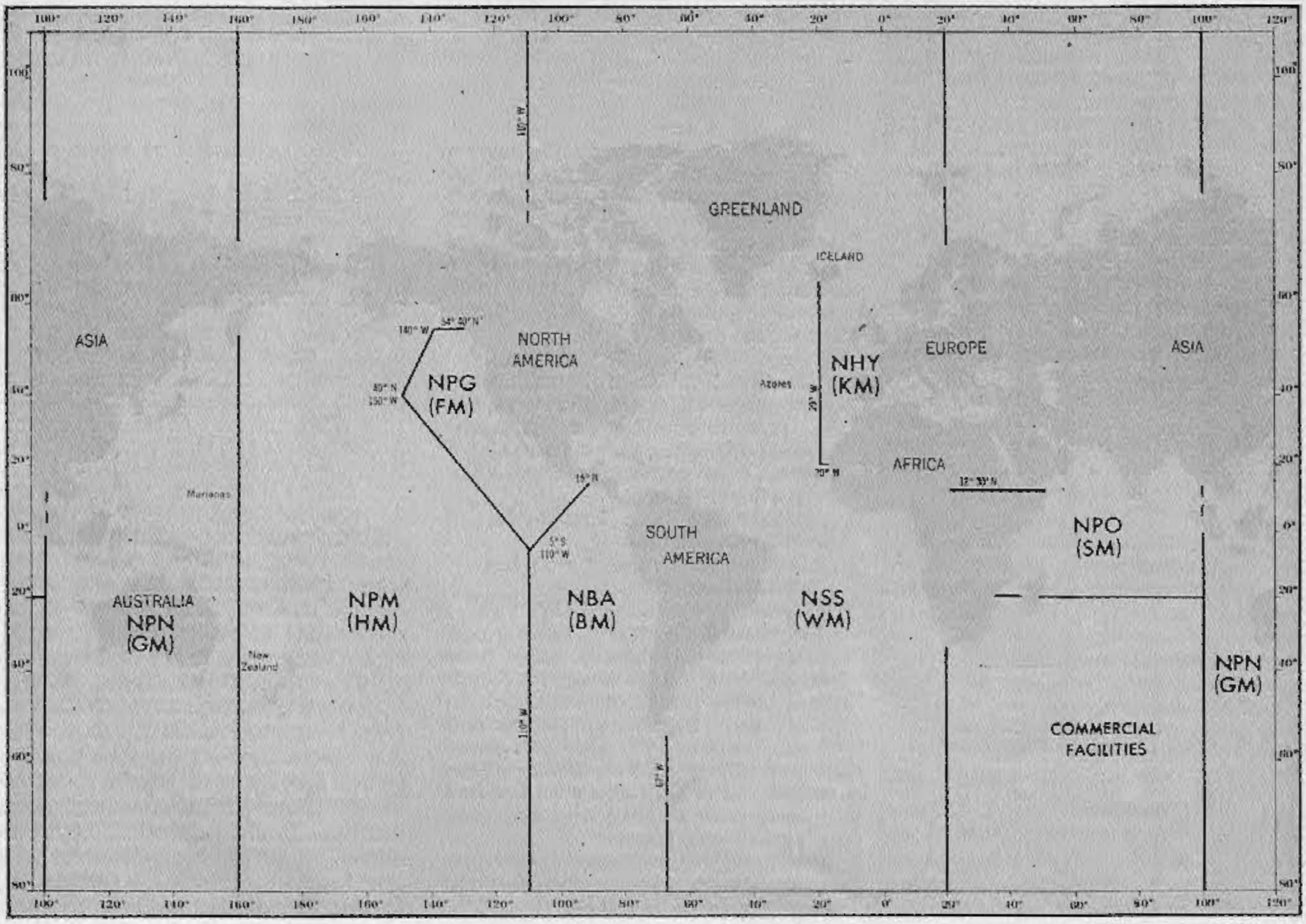
The information urges Masters and Radio Officers to become familiar with the instructions in order to receive maximum protection from U. S. Naval Forces. In addition to the Appendix the information is part of H. O. Publication No. 205, Radio Navigational Aids.

Part I covers U. S. Control of Merchant Vessels, General and Supplementary Emergency Messages, Instructions to U. S. Controlled Merchant Ships at Sea, Instructions to U. S. Controlled Merchant Ships in Port, Authorities who will issue Routing Instructions to Merchant Ships, and a chart of U. S. Operational Control Authority Areas.

Part II includes Communication Facilities and Procedures. Part III, Shipping Control Procedures, will be issued at a later time. Under Part II is a U. S. Peacetime *Mercast* areas chart which is reproduced below. The primary method of delivering messages from Naval shore radio stations to merchant ships at sea is by this *Mercast* system. The Navy operates a number of shore radio stations, geographically located to provide the widest possible coverage, with each station assigned an area of responsibility within which it delivers traffic by means of scheduled broadcasts. The *Mercast* is a broadcast concept under which no acknowledgement from ships addressed is required or desired.

The MERCAST area stations are shown below, and the frequencies and time employed are shown in Broadcast Schedules of the U. S. Navy and Coast Guard Stations, Appendix B of H. O. 205. It is recommended this appendix be posted in the radio room for ready reference.

STATION	CALL
RADIO WASHINGTON	NSS
RADIO MANILA	NPO
RADIO BALBOA	NBA
RADIO SAN FRANCISCO	NPG
RADIO PEARL HARBOR	NPM
RADIO GUAM	NPN
RADIO PORT LYAUTEY	NHY



032° + 180° = 112°?

A Great Lakes tanker has a soft mud bottom to thank for being spared serious damage in a recent casualty caused by an embarrassing schoolboy error in arithmetic.

A mental miscalculation that the reciprocal of 032° was 112°—an error of 100°—placed this vessel on a heading straight for the beach. Due to radar trouble as they approached fog patches, the master decided to parallel the recommended course on the Lake Michigan chart for the next leg of his voyage—032° or 212°.

Accordingly, the master and mate on watch laid the course down from their DR position to the next change of course. The master held the straight-edged ruler and the mate drew in the line. The line was correctly drawn, but due to the arithmetic error it was labeled "112°," instead of 212°. The man at the wheel repeated the course, made the change, and the mate carefully logged the new heading as 112°.

The third mate relieved the watch, accepted the course as 112°, and the master continued efforts to put the radar in working condition. During the next hour and 20 minutes the course was repeated twice, and still the error went undetected.

Big Sable Light was sighted off the starboard bow, but being a fixed light it was assumed to be the stern light of a car ferry known to be ahead. Shortly after sighting this light a dark streak was seen through the fog, which was first thought to be an opening in the visibility. Instead, it was land. The engines were put full astern and less than a minute later the vessel oozed ashore on a providential soft mud bottom.

The ballasted vessel was able to float herself free, and an internal examination failed to reveal any damage. *This Lesson from Casualty* bears repeating to illustrate how a slip of the mind and acceptance of the error can lead your ship to disaster.

CASUALTIES TO VESSELS—FISCAL YEAR 1953

(1 July 1952–30 June 1953)

	Groundings and founderings	Collisions with other vessels	Collisions with miscellaneous objects	Fires and explosions	Heavy weather and materiel damage	Damage to lifesaving equipment	Totals
Number of casualties	601	318	291	195	229	19	1,663
Number of vessels involved	601	732	291	195	229	19	2,067
Gross tonnage of U. S. Merchant vessels involved	2,218,524	1,919,317	1,378,916	266,895	1,651,279	153,864	7,588,795
Number of inspected vessels involved	333	290	237	46	218	17	1,141
Number of uninspected vessels involved	268	442	54	149	11	2	926
Type of vessels involved:							
Passenger	11	14	13	5	4	3	50
Freight	190	146	150	26	160	13	685
Tank vessels	121	119	57	21	49	2	369
Public vessels	5	31	3	2	4	0	45
Ferry	10	7	13	0	2	0	32
Towing	42	165	33	21	7	1	269
Fishing	124	55	12	60	3	0	254
Foreign flag	0	73	0	0	0	0	73
Miscellaneous	98	122	10	60	0	0	290
Persons on board:							
Passengers	2,176	8,073	2,987	128	9,683	1,033	24,080
Crew	12,795	12,251	9,601	1,857	9,704	1,442	47,650
Shore workers	15	171	9	106	106	0	407
Value of property lost or damaged:							
Vessels	$10,611,694	$18,947,360	$2,787,476	$9,033,983	$3,171,035	$74,750	$44,626,307
Cargoes	$1,446,671	$641,712	$109,420	$1,581,716	$262,670	$15,000	$4,057,189
Vessels with damage unreported	11	80	5	1	0	0	97
Cargoes with damage unreported	17	84	5	1	0	0	107
Vessels totally lost:							
Inspected	3	1	0	4	0	0	8
Gross tonnage	12,186	7,239	0	10,389	0	0	29,814
Uninspected	95	19	10	86	0	0	210
Gross tonnage	5,782	7,269	182	4,080	0	0	17,313
Number of casualties due to personnel fault:							
Employed under license or certificate	49	56	22	4	13	2	146
Others	53	96	13	22	20	0	204
Lives lost in casualties:							
Passengers—							
Off inspected vessels	0	0	0	0	0	0	0
Off uninspected vessels	59	7	0	13	0	0	79
Crew—							
Off inspected vessels	21	6	0	8	1	0	36
Off uninspected vessels	108	14	6	12	0	0	140
Shore workers—							
Off inspected vessels	0	0	0	5	0	0	5
Off uninspected vessels	1	0	0	3	0	0	4
Assistance rendered by U. S. Coast Guard	108	32	9	45	16	2	212

Deaths not involving casualty to vessel:	
Passengers	65
Crew	346
Shore workers	40

Injuries to personnel not involving casualty to vessel:	
Number of personnel incapacitated for more than 72 hours	559

NOTE: Tabulation made on basis of casualty cases closed as of 10 September 1953.

HOW HIGH IS UP?

Seamen, by the nature of their profession, hardly fall into the category of the man who said, "I don't care how high I go, as long as I have one foot on the ground."

Despite modern ships and gear, there are times the continued safe operation of a ship depends on leaving the deck for one job or another. A recent inquiry to Coast Guard Headquarters requested advice if an ordinary seaman may be assigned duties which require him to go aloft.

A similar inquiry was made to the Director of the former Bureau of Marine Inspection and Navigation, to which he replied:

"This Bureau is unaware of any law or custom which would justify an ordinary seaman in refusing a lawful order of the master or other ship's officer, directing such ordinary seaman to go aloft, provided the ordinary seaman is of normal health and other conditions do not present any unusual hazards while aloft."

During the period since the above statement was made, the Coast Guard has not had any reason which would cause it to reject the basic premise made, as long as all normal precautions and measures were taken to insure the safety of the seamen. As in all cases, there are instances when it could be considered ill-advised for the master to order a person aloft if he is aware the person concerned suffered from acrophobia or was otherwise physically or mentally unable to safely comply with the order.

With the respect of obedience of a seaman to the lawful commands of the master, no statute of law has been enacted which permits a seaman, either expressly, or impliedly, to disobey a lawful order of a superior. However, certain statutory safeguards have been provided, each carrying its own form of remedy available to the seaman. However, these do not allow him to disobey an order of the master or other superior officer at the time it is given. It is his duty to obey, leaving the determination of the legality of the order to the proper time, place, and authority.

CASUALTIES TO VESSELS—FISCAL YEAR 1954

(1 July 1953–30 June 1954)

	Groundings and founderings	Collisions with other vessels	Collisions with miscellaneous objects	Fires and explosions	Heavy weather and materiel damage	Damage to lifesaving equipment	Totals
Number of casualties	550	263	268	254	237	24	1,596
Number of vessels involved	550	643	268	254	237	24	1,976
Gross tonnage of U. S. merchant vessels involved	1,800,369	1,461,631	1,304,383	213,274	1,704,451	271,112	6,755,220
Number of inspected vessels involved	249	234	205	41	223	24	976
Number of uninspected vessels involved	301	409	63	213	14	0	1,000
Type of vessels involved:							
Passenger	9	11	14	5	3	4	46
Freight	140	96	139	29	150	14	568
Tank vessels	98	90	32	10	45	5	280
Public vessels	7	40	3	1	12	1	64
Ferry	7	7	12	3	8	0	37
Towing	31	151	37	26	10	0	255
Fishing	123	59	2	83	3	0	270
Foreign flag	0	45	0	0	0	0	45
Miscellaneous	135	144	29	97	6	0	411
Persons on board:							
Passengers	2,313	1,321	4,630	184	6,077	487	15,012
Crew	10,159	9,336	8,801	1,680	11,091	2,980	44,047
Shore workers	56	5	213	537	13	0	824
Value of property lost or damaged:							
Vessels	$13,620,468	$7,083,320	$3,486,765	$7,399,865	$4,278,609	$91,880	$35,960,967
Cargoes	$2,467,145	$1,544,826	$27,911	$533,270	$411,050	$36,500	$5,020,702
Vessels with damage unreported	7	24	1	1	4	0	37
Cargoes with damage unreported	7	26	1	2	5	0	41
Vessels totally lost:							
Inspected	4	1	0	10	0	0	15
Gross tonnage	2,239	7,869	0	610	0	0	10,718
Uninspected	107	17	7	150	0	0	281
Gross tonnage	9,051	309	68	5,251	0	0	14,679
Number of casualties due to personnel fault:							
Employed under license or certificate	26	42	19	0	20	2	109
Others	55	77	15	19	15	0	181
Lives lost in casualties:							
Passengers—							
Off inspected vessels	0	0	0	0	0	0	0
Off uninspected vessels	75	0	2	7	1	0	85
Crew—							
Off inspected vessels	1	9	0	3	2	1	16
Off uninspected vessels	100	2	1	21	1	0	125
Shore workers—							
Off inspected vessels	0	0	0	6	0	0	6
Off uninspected vessels	0	0	0	8	0	0	8
Assistance rendered by U. S. Coast Guard	141	45	20	86	19	1	312

Deaths not involving casualty to vessel:	
Passengers	68
Crew	310
Shore workers	33

Injuries to personnel not involving casualty to vessel:	
Number of personnel incapacitated for more than 72 hours	707

HORIZONTAL GUILLOTINE

A free swinging shipboard ice box door has been likened to a horizontal guillotine, which can crush an arm or leg if not properly hooked back in place or held open.

Too often a member of the stewards department makes a trip to one of the reefer boxes, loses his balance with an arm-load of food, and has the heavy door crunch down on him. Encourage all persons using the boxes to hook the door back, or better yet, in heavy weather see that these men work in pairs.

The interior ice-box alarms should be tested and kept in proper working order, and members of the crew warned to take action when the alarm sounds off. The United States P and I Agency relates the story of an engineer who ordered a crew member to break the circuit because the cargo reefer alarm kept ringing. He said the longshoremen were always pressing the alarm button in the reefer by mistake, thinking it was the light switch. Only this time a man was inside and couldn't get out. Many reefer boxes are equipped with emergency release locks that can be operated from the inside, but such precautions are not always installed and sometimes do not work.

Make it a safety practice on your ship to check the reefer box alarms whenever they ring.

SAFETY IS THIS

1. Follow instructions; don't take chances; if you don't know ask.
2. Correct or report unsafe conditions.
3. Help keep everything clean and orderly.
4. Use the right tools and equipment for the job; use them safely.
5. Report all injuries; get first aid promptly.
6. Use, adjust, and repair equipment only when authorized.
7. Use prescribed protective equipment; wear safe clothing; keep clothes in good condition.
8. Don't horseplay; avoid distracting others.
9. When lifting, bend your knees, get help for heavy loads.
10. Comply with all safety rules and signs.

From Higgins, Inc.

CASUALTIES TO VESSELS—FISCAL YEAR 1955

(1 July 1954–30 June 1955)

	Groundings and founderings	Collisions with other vessels	Collisions with miscellaneous objects	Fires and explosions	Heavy weather and materiel damage	Damage to lifesaving equipment	Totals
Number of casualties	562	244	268	231	203	21	1,529
Number of vessels involved	596	580	285	251	205	21	1,938
Gross tonnage of U. S. Merchant vessels involved	1,665,373	1,242,800	1,331,930	174,031	1,664,839	203,085	6,282,157
Number of inspected vessels involved	221	181	209	52	195	20	878
Number of uninspected vessels involved	375	399	76	199	10	1	1,060
Type of vessels involved:							
Passenger	11	14	11	4	14	2	56
Freight	131	95	145	23	111	13	518
Tank vessels	88	81	43	24	50	5	291
Public vessels	5	21	5	2	15	0	48
Ferry	6	5	13	4	6	0	34
Towing	37	107	35	20	5	0	204
Fishing	134	46	5	73	0	1	259
Foreign flag	0	60	0	0	0	0	60
Miscellaneous	184	151	28	101	4	0	468
Persons on board:							
Passengers	474	2,161	3,381	423	11,124	40	17,603
Crew	9,069	9,182	8,848	1,408	12,364	1,864	42,735
Shore workers	4	78	54	206	80	75	497
Value of property lost or damaged:							
Vessels	$15,265,589	$5,767,045	$2,738,303	$4,525,267	$2,574,086	$82,460	$30,952,840
Cargoes	$1,327,501	$926,700	$119,570	$731,800	$83,700	0	$3,189,271
Vessels with damage unreported	24	54	29	5	7	1	120
Cargoes with damage unreported	31	47	24	5	6	1	114
Vessels totally lost:							
Inspected	4	0	0	0	0	0	4
Gross tonnage	16,763	0	0	0	0	0	16,763
Uninspected	130	21	6	132	0	0	289
Gross tonnage	7,643	2,033	735	2,417	0	0	12,828
Number of casualties due to personnel fault:							
Employed under license or certificate	17	24	9	0	19	2	71
Others	41	86	10	20	11	0	168
Lives lost in casualties:							
Passengers—							
Off inspected vessels	0	1	0	0	0	0	1
Off uninspected vessels	73	10	5	2	0	0	90
Crew—							
Off inspected vessels	60	0	0	0	0	1	61
Off uninspected vessels	130	13	5	20	0	0	168
Shore workers—							
Off inspected vessels	0	0	1	2	0	0	3
Off uninspected vessels	0	0	0	4	0	0	4
Assistance rendered by U. S. Coast Guard	144	43	7	72	7	2	275

Deaths not involving casualty to vessel:	
Passengers	70
Crew	285
Shore workers	48

Injuries to personnel not involving casualty to vessel:	
Number of personnel incapacitated for more than 72 hours	782

MERCHANT MARINE DECORATIONS

Effective March 15, 1957, the Maritime Administration authorized the wearing of the Korean Service Bar to qualified seamen of the American Merchant Marine who served in waters adjacent to Korea between June 30, 1950, and September 30, 1953.

In addition to this decoration, Maritime Administration officials indicated that replacement of ribbons previously issued for service during World War II may be obtained at a cost of 28 cents each from the A. & N. Trading Co., Eighth and D Streets NW., Washington, D. C., low bidder for the contract to supply the decorations. This company is the sole agent for the ribbons, it was pointed out.

Application for the Korean Bar must be made to the Seamen Services Section, Maritime Administration, Washington 25, D. C., giving the name of the vessel, period of service, and area served. All eligible applicants will be furnished an "authorization card" which when presented to the A. & N. Trading Co., either in person or by mail, will permit purchase of the bar.

Likewise, request for replacement ribbons must be accompanied by "authorization cards" when the application is made. Should duplicate cards be required, they may be obtained upon application to the Seamen Services Section of the Maritime Administration.

Other decorations, beside the Korean Bar, that have been authorized by the Maritime Administration and its predecessor war-time agencies include the Atlantic, Pacific, Mediterranean-Middle East War Zone Bars, the Combat Bar, the Defense Bar, and the Victory Medal Bar.

Sale of any merchant marine decoration without the presentation of the above mentioned "authorization card" or written authorization of the Seamen Services Section is prohibited by law, it was emphasized.

CASUALTIES TO VESSELS—FISCAL YEAR 1956

(1 July 1955–30 June 1956)

	Groundings and founderings	Collisions with other vessels	Collisions with miscellaneous objects	Fires and explosions	Heavy weather and materiel damage	Damage to lifesaving equipment	Totals
Number of casualties	640	279	342	271	225	7	1,764
Number of vessels involved	674	715	401	272	228	7	2,297
Gross tonnage of U. S. merchant vessels involved	1,836,209	1,518,267	1,663,414	313,354	1,707,850	68,315	7,107,409
Number of inspected vessels involved	246	240	245	50	214	7	1,002
Number of uninspected vessels involved	428	475	156	222	14	0	1,295
Type of vessels involved:							
Passenger	9	9	6	6	7	1	38
Freight	179	109	175	27	136	6	632
Tank vessels	74	103	66	22	54	0	319
Public vessels	1	33	5	1	10	0	50
Ferry	5	13	14	1	4	0	37
Towing	63	167	64	23	10	0	327
Fishing	124	36	8	75	2	0	245
Foreign flag	0	84	0	0	0	0	84
Miscellaneous	219	161	63	117	5	0	565
Persons on board:							
Passengers	1,476	994	3,188	1,169	5,411	826	13,064
Crew	11,199	9,349	10,198	2,570	10,506	835	44,657
Shore workers	8	52	25	287	213	50	635
Value of property lost or damaged:							
Vessels	$13,909,330	$5,238,801	$4,252,709	$6,460,184	$2,742,342	$31,100	$32,634,466
Cargoes	$3,080,249	$296,006	$37,042	$601,598	$194,600	$1,000	$4,201,395
Vessels with damage unreported	24	55	24	14	15	0	132
Cargoes with damage unreported	24	49	16	16	11	0	116
Vessels totally lost:							
Inspected	6	1	0	4	0	0	11
Gross tonnage	12,264	2,477	0	12,145	0	0	26,886
Uninspected	175	15	6	167	0	0	363
Gross tonnage	17,417	240	25	2,640	0	0	20,322
Number of casualties due to personnel fault:							
Employed under license or certificate	14	20	12	0	0	0	46
Others	52	100	20	15	15	1	203
Lives lost in casualties:							
Passengers—							
Off inspected vessels	0	0	0	0	0	0	0
Off uninspected vessels	123	1	3	10	0	0	137
Crew—							
Off inspected vessels	0	5	0	21	0	0	26
Off uninspected vessels	150	1	1	9	0	0	161
Shore workers—							
Off inspected vessels	0	0	0	4	0	0	4
Off uninspected vessels	0	0	0	2	0	0	2
Assistance rendered by U. S. Coast Guard	176	16	19	69	10	0	290

Deaths not involving casualty to vessel:

Passengers	68
Crew	313
Shore workers	52

Injuries to personnel not involving casualty to vessel:

Number of personnel incapacitated for more than 72 hours	1,013

MAILING LIST FOR PROCEEDINGS

It is required by the regulations of the Joint Committee on Printing, dated November 1, 1956 No. 9 Revised, that the mailing list for the Proceedings of the Merchant Marine Council be circularized to determine whether this publication is still desired by the persons to whom it is addressed.

All addressees on the mailing list for the Proceedings will be sent a card requesting that an affirmative reply be returned to the Commandant (CMC), United States Coast Guard, by no later than July 1, 1957.

If you desire to continue to receive the Proceedings and you do not receive a card by June 1, 1957, it is suggested that you send a card to the Commandant (CMC), United States Coast Guard, Washington 25, D. C., setting forth the following information:

(a) Quantity desired.

(b) Quantity now received.

(c) Name and address to which the Proceedings are now sent.

(d) The new postal address, if different from that to which the Proceedings are now sent.

(e) Name of the firm, company, corporation, or individual requesting the Proceedings.

(f) The nature of your profession or business or relation to marine safety.

In order to reduce the size of the mailing list to budgetary limitations it is most advantageous to have copies of the Proceedings, when several are involved, mailed under the same cover to the same address. Unless there is some reason to make this impracticable in certain cases, multiple addressees of this type will normally be grouped in this manner.

Only a limited number of copies of the Proceedings are published each month. Its distribution is accordingly limited to those concerned with marine safety or engaged in activities under the cognizance of the Coast Guard. To insure that the Proceedings receives the widest possible dissemination, it is requested that recipients of this periodical make it available to as many other people as is feasible.

If no affirmative reply requesting continuance is received by July 1, 1957, the addressees named will be removed from the mailing list.

MARINE SAFETY PUBLICATIONS AND PAMPHLETS

The following publications and pamphlets are available and may be obtained upon request from the nearest Marine Inspection Office of the United States Coast Guard, except for cost publications which may be obtained upon application to the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Date of each publication is indicated following title.

CG No.	*Title of Publication*
101	Specimen Examinations for Merchant Marine Deck Officers. 1–50
108	Rules and Regulations for Military Explosives. 5–15–54
115	Marine Engineering Regulations and Material Specifications. 3–1–56
118	Overtime Services. 8–46
123	Rules and Regulations for Tank Vessels. 10–1–56
129	Proceedings of the Merchant Marine Council. Monthly
169	Rules to Prevent Collisions of Vessels and Pilot Rules for Certain Inland Waters of the Atlantic and Pacific Coasts and of the Coast of the Gulf of Mexico. 3–1–55
172	Pilot Rules for the Great Lakes and their connecting and Tributary Waters and the St. Marys River. 1–3–55
174	A Manual for the Safe Handling of Inflammable and Combustible Liquids. 7–2–51
175	Manual for Lifeboatmen and Able Seamen, Qualified Members of Engine Department, and Tankerman. 3–5–54
176	Load Line Regulations. [illegible]–1–53
182	Specimen Examinations for Merchant Marine Engineer Licenses. 5–49
184	Pilot Rules for the Western Rivers and the Red River of the North. 1–3–55
187	Explosives or Other Dangerous Articles on Board Vessels. 7–1–54 (Cost Pub. $2.50 from GPO)
190	Equipment Lists. 3–1–56
191	Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel. 9–15–55
200	Marine Investigation Regulations and Suspension and Revocation Proceedings. 4–13–53
220	Specimen Examination Questions for Licenses as Master, Mate, and Pilot of Central Western Rivers Vessels. 6–51
227	Laws Governing Marine Inspection. 7–3–50
239	Security of Vessels and Waterfront Facilities. 6–16–52
249	Merchant Marine Council Public Hearing Agenda. Annually
256	Rules and Regulations for Passenger Vessels. 11–19–52
257	Rules and Regulations for Cargo and Miscellaneous Vessels. 6–1–55
258	Rules and Regulations for Uninspected Vessels. 7–1–55
259	Electrical Engineering Regulations. 6–1–55
266	Rules and Regulations for Bulk Grain Cargo. 2–13–53
267	Rules and Regulations for Numbering Undocumented Vessels. 1–15–53
268	Rules and Regulations for Manning of Vessels. 11–19–52
269	Rules and Regulations for Nautical Schools. 11–1–53
270	Rules and Regulations for Marine Engineering Installations Contracted for Prior to July 1, 1935. 11–19–52
290	Motorboats. 2–1–56
293	Miscellaneous Electrical Equipment List. 4–1–54

Official changes in rnles and regulations are published in the Federal Register, which is printed daily except Sunday, Monday and days following holidays. The Federal Register is a sales publication and may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. It is furnished by mail to subscribers for $1.50 per month or $15.00 per year, payable in advance. Individual copies desired may be purchased as long as they are available. The charge for individual copies of the Federal Register varies in proportion to the size of the issue and will be 15 cents unless otherwise noted on the table of changes below.

Changes Published During January and February 1957

The following have been modified by Federal Registers:

CG–190, Federal Register January 30, 1957.
CG–239, Federal Register January 29, 1957.

U. S. GOVERNMENT PRINTING OFFICE: 1957