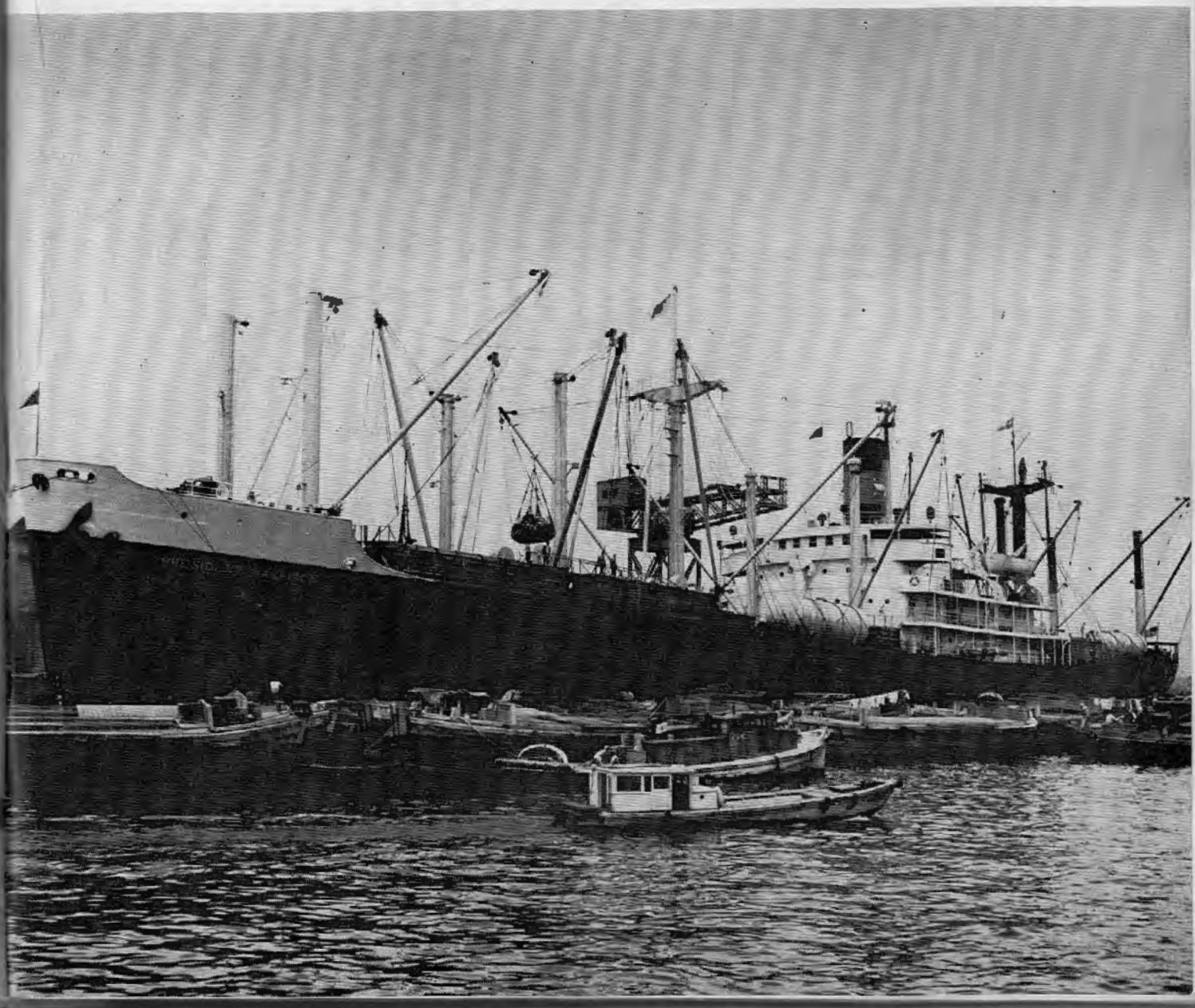
PROCEEDINGS OF THE
MERCHANT MARINE COUNCIL

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

UNITED STATES COAST GUARD

CG 129

Vol. 14 January 1957 No. 1



Proceedings of the

MERCHANT MARINE COUNCIL

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The Merchant Marine Council of the United States Coast Guard

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Interesting picture of the SS *President Harrison* discharging mixed cargo in Yokohama. Note gear rigged for fast turn-around to dock and barges alongside. Photograph courtesy *American President Lines.*

BACK COVER

Two seamen on the SS *Mormacmail* standby to take a line from the tug *Gremlin.* Photograph colurtesy of *Hans Marx.*

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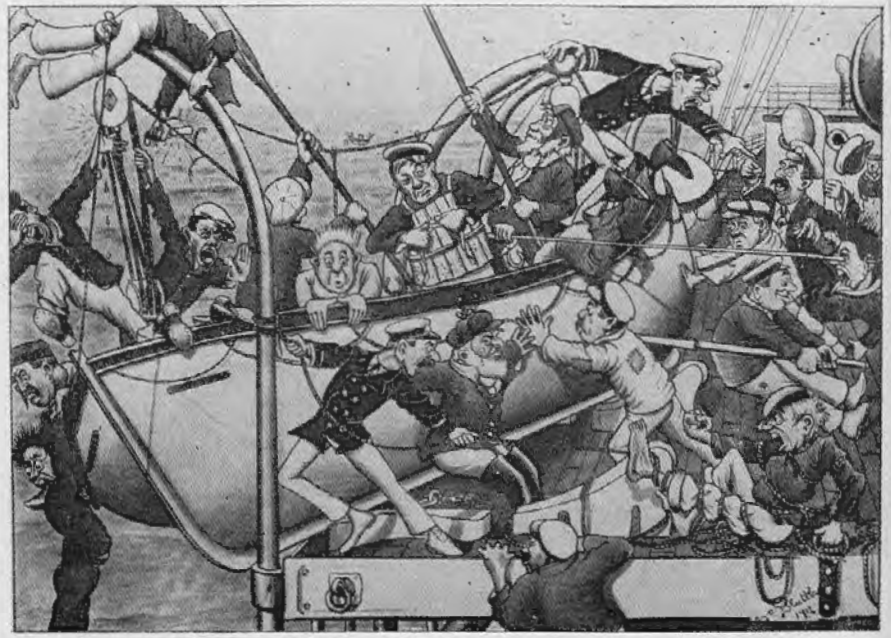

From "Humours of the Mercantile Navy" by E. G. O. Beuttler

"MAN OVERBOARD:" No doubt the old cliche, "just like fire and boat drill," was adopted after the appearance of this early British cartoon. Almost every rule of good seamanship is violated. Are you one of the men illustrated in this hubbub of confusion?

LEGAL EFFECT OF RADAR

By Nicholas J. Healy, 3rd

THE disastrous collision between the *Andrea Doria* and the *Stockholm* has captured the attention, not only of the admiralty bar, but of the public as a whole. Here were two of the finest ships afloat, each equipped with the most modern radar and other modern navigational aids, and yet they came together in the open sea with tragic consequences which are only too well known to all of us.

The press and the public immediately raised the question: How could such a thing happen, when both vessels were equipped with radar? Such a question is the result of a popular misconception of the function of radar on shipboard. Many people conceive of radar as something in the nature of television. They have the notion that a radar screen is like a TV screen upon which may be seen all vessels and other objects within the range of the radar set.

As admiralty attorneys we all know that unfortunately this is not the case. Another vessel will appear on a radar screen merely as a minute dot of light, or "pip", as it is usually called, and the "pip" will appear motionless, even though it may represent a vessel proceeding at a very high rate of speed. A single observation will reveal neither the course nor the speed of the other vessel, but only its bearing, that is, its direction in relation to true north or in relation to the heading of the radar vessel, and its distance from the radar vessel. (*See Figures 1, 2, and 3.*)

HUMAN ELEMENT

To be of any further value, a radar observation must be repeated several times, and the observations must be plotted on a plotting sheet, a Hydrographic Office "maneuvering board", or a transparent plotting device fitted over the radar screen itself. A line drawn between the various positions so plotted will then indicate the observed vessel's course. By measuring the distance between the plotted positions to scale, and noting the time when each position was observed, the approximate speed of the observed vessel can be readily calculated. The navigator then knows whether or not his vessel and the observed vessel are on "collision" courses, that is, courses which, in the absence of a change in course or speed on the part of one or both of the two vessels involved, are likely to bring them into collision.

It will thus be seen that radar equipment is useless as an aid in the avoidance of collision unless it is skillfully handled and unless the information which it furnishes is accurately plotted and properly interpreted. It is here that the human element becomes of importance and human failure can be so disastrous.

As admiralty attorneys we know that radar has resulted in a marked decrease in the number of collisions at sea, but that collisions still do occur between radar equipped vessels. Furthermore, we know that in the hands of an incompetent operator, radar sometimes produces a false sense of security which will lead him to continue at a high rate of speed in areas of limited visibility, so that if a collision does occur, the resulting damage will be extremely severe.

Some seventeen radar cases have already been decided in American, English and Canadian courts, and it is safe to assume that many times that number have been either settled before trial or are still awaiting trial. The decided cases have not resolved all of the legal questions which the advent of radar has created, but they have resolved some of them. We shall attempt to summarize these questions and the answers to such of them as have been answered by the courts.

1. Is lack of radar equipment a fault?

No statute or regulation requires a merchant vessel to be radar-equipped. There may come a time when Congress will see fit to enact legislation requiring radar, at least on sea-going passenger and cargo vessels. If such a statute is passed, its violation will of course impose the violator the burden of proving that the absence of radar not only did not, but could not have contributed to a collision. This would be an application of the familiar rule of the *Pennsylvania*.[1] Furthermore, even prior to the enactment of any such legislation, there may come a time when radar will be so generally accepted as standard equipment that failure to have it on board a vessel will be considered by the courts as constituting an unseaworthy condition, and vessels without it may be held at fault for collisions which could have been avoided by the proper use of radar.[2]

2. Is a vessel equipped with radar at fault for a collision resulting from her failure to use it at all?

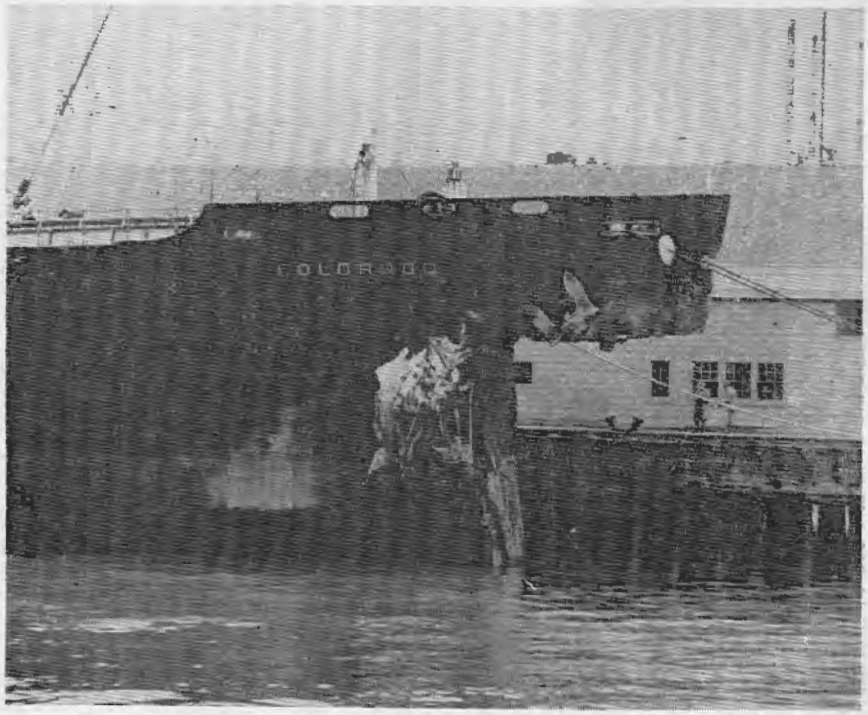

Photo Courtesy States Steamship Company

BATTERED BOW: An interesting picture of the radar equipped SS *Colorado* prior to start of repair work following collision with the SS *Permanente Silverbow* off the coast of California.

FIRST RADAR CASE

This question was answered in the affirmative in the first American radar case ever decided. In the *Thomas Barry-Medford*,[3] a fog collision occurred between a radar-equipped army transport and fishing trawler. On the morning of October 21, 1945, the *Barry*, proceeding from New York to Le Havre with troops, was steering an easterly course. When about 125 miles east of Nantucket Lightship, she sighted a heavy fog bank ahead, but nevertheless maintained her full speed of 18 knots. About 22 minutes later she entered the fog bank, still under a full bell. A minute later she struck the starboard side of the *Medford*, which she did not see until the vessels were only 200 or 300 feet apart. The *Medford* had been trawling at 3 knots on a southerly course. She sank in a matter of minutes. Seven men on the schooner lost their lives and two were severely injured.

The *Barry* was equipped with a Navy type radar and there were two rated Navy radarmen in her crew. Despite her excessive speed and the dense fog conditions ahead, the *Barry's* radar equipment was never used. Her master claimed that he endeavored to find the radarmen some time before entering the fog bank, but apparently did not persist in his attempt, and made no use of the public address system, although the vessel was equipped with one. In condemning the *Barry* for the tragic consequences of this neglect, the Court stated in its opinion:

> The failure of the *Barry* to use her radar is the most serious and sinister aspect of these causes. The perfection of that device is thought to have invoked a new concept of the responsibilities attaching to vessels so equipped, touching their handling and operation in or near a fog-bound area. * * * The stipulated proof here is that the offending ship could have informed herself of the presence and track of the *Medford* in abundant time to have avoided by a wide margin any danger whatever of striking her. Under such circumstances, it is impossible to yield to the argument for the *Barry*, that her conduct is to be condoned to any extent, in view of her failure to employ the very device which was installed to prevent a collision, and to operate which she carried two men having special rating in the U. S. Navy to attest their qualifications, and who had no duty on the ship other than to operate the radar unit.

There was no appeal.

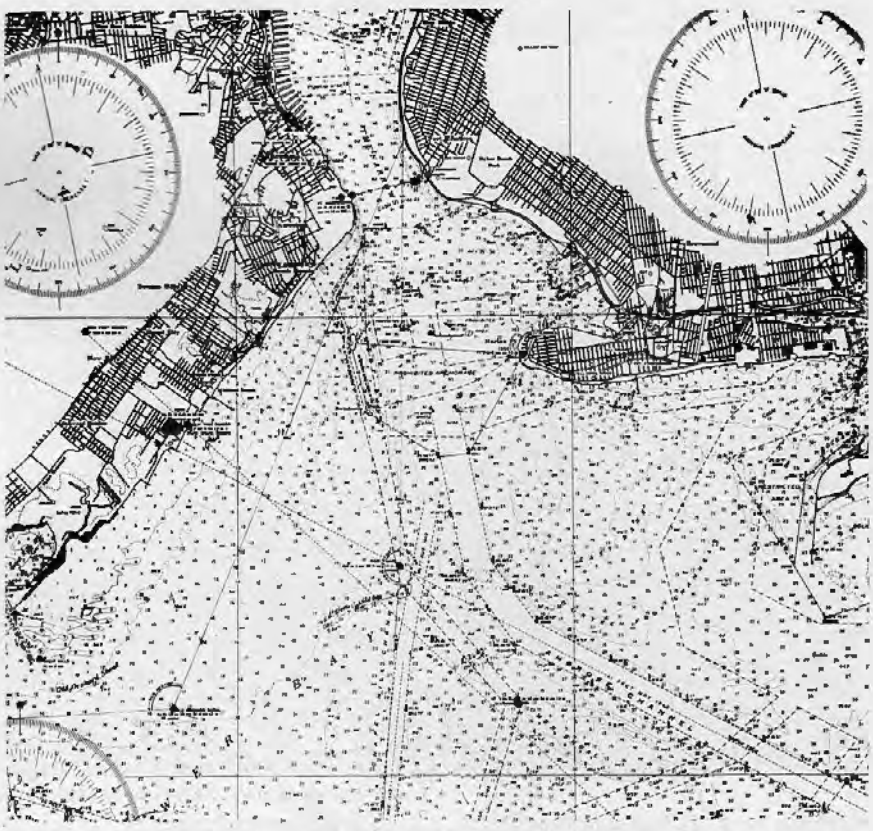

Figure 1. **A chart showing the entrance to the Narrows in New York Harbor.**

In a more recent case (*Duke of York-Haiti Victory*)[4] the doctrine of the *Thomas Barry* was restricted to a situation where the necessity for the use of radar is, or should be apparent to the navigator of the radar-equipped vessel. The *Haiti Victory* had been proceeding in clear weather and the *Duke* was concealed in a fog patch on the Victory ship's starboard bow, the existence of which her navigator had no reason to suspect. The District Court, in exonerating the Victory ship, said:

> His failure to see the *Duke* was not negligence, for it was not the result of neglect of an obligation. No obscurity obligated him to use his radar, and there was nothing else to put him on notice of any need for it.

The decision was affirmed on appeal.

SILENT LOOKOUT

In line with the *Thomas Barry* is a recent English case, the *Esso Plymouth*.[5] There, both vessels were held at fault for a collision in a bank of smoke. The *Esso Plymouth* was equipped with radar of a type which took three minutes to warm up, but her navigator failed to switch it on in time, although he knew that his vessel was approaching the smoke bank. In commenting on the faults of the *Esso Plymouth*, the Admiralty Division of the High Court of Justice had this to say:

> Moreover, the *Esso Plymouth* had on board a potential silent look-out, which could have been used if it had been made available in time. In saying that I am speaking of her radar instrument. * * * I can think of no good reason why there was that unfortunate delay in switching on the radar of the *Esso Plymouth*. But, again that is only part of the major charge of bad look-out, which resulted in her, like the *Elblag*, blundering into this bank of smoke at high speed.

Of course, if the navigator has good reason to believe that the information which he is receiving on the radar screen is inaccurate, he should not rely upon it. In the *Isaac T. Mann-the Esso Aruba*,[6] the Court exonerated the *Mann*, whose master had secured the vessel's radar equipment when he found that its proper functioning was being hampered by "a lot of interference". The Court said:

> Advocate for the *Aruba* argues that the *Mann* was at fault because it discontinued using its radar sometime before the collision. Captain Keating had been using the radar aboard the *Mann* on a five-mile range for the passage between Providence and Sandy Point; on the five-mile range false targets were picked up.

"We were getting quite a lot of interference," Captain Keating testified. At the time the *Mann* ran into fog he "gave up trying to use the radar because the objects were so hard to make out." I find that Captain Keating under all the attending facts and circumstances, was not negligent in discontinuing the use of the radar. While radar is one of the greatest boons devised for navigation, it is not a fixed and invariable rule that the navigator must use it in all events. There might well be times when the continued use of radar by a navigator who was uncertain of the results he was observing and unwilling to place reliance thereon might well be foolhardy and hazardous. There should be a certain discretion allowed competent and experienced shiphandlers to use or not use radar as the circumstances of the moment require.

There is no suggestion in the opinion that the "interference" was the result of any defect in the radar equipment itself. This leads to the consideration of our third question:

3. Is it a fault to fail to maintain radar equipment in an efficient state of repair?

This question is still to be squarely decided by the courts. However, in *Duke of York-Haiti Victory*, to which reference has previously been made, the District Court indicated that such a failure may constitute a fault. I quote from the opinion:

At this point it is well to refer to the *Duke's* radar. Its use would have avoided the collision and its unavailableness was due to neglect of repair. There was ample warning—a day or two—of its disrepair. Had it been in operation, the situation so urgently demanding its services, omission to use it would clearly have been negligence. However, as the *Duke of York's* excessive speed was the predominant fault leading to the collision, it is not necessary in this case to pass upon the question of whether or not, in the absence of statute requiring radar, a lack of diligence in maintaining existing radar facilities is negligence.

FAILURE TO USE RADAR

If failure to use radar when conditions warrant is a fault, it would seem logical to hold that negligent failure to have it ready for use is likewise a fault. This is but an application of the settled principle that a vessel must make use of all the means at hand to avoid a collision. In a sense this may impose a burden on the vessel which carries radar equipment which the vessel without such equipment does not share, but in principle it is little different from expecting a steamship to maintain her machinery properly, even though a sailing vessel may have no machinery at all.

4. Is failure to interpret radar information correctly a fault?

Here the answer is clearly "yes", according to American, English and Canadian decisions alike.[7] As the

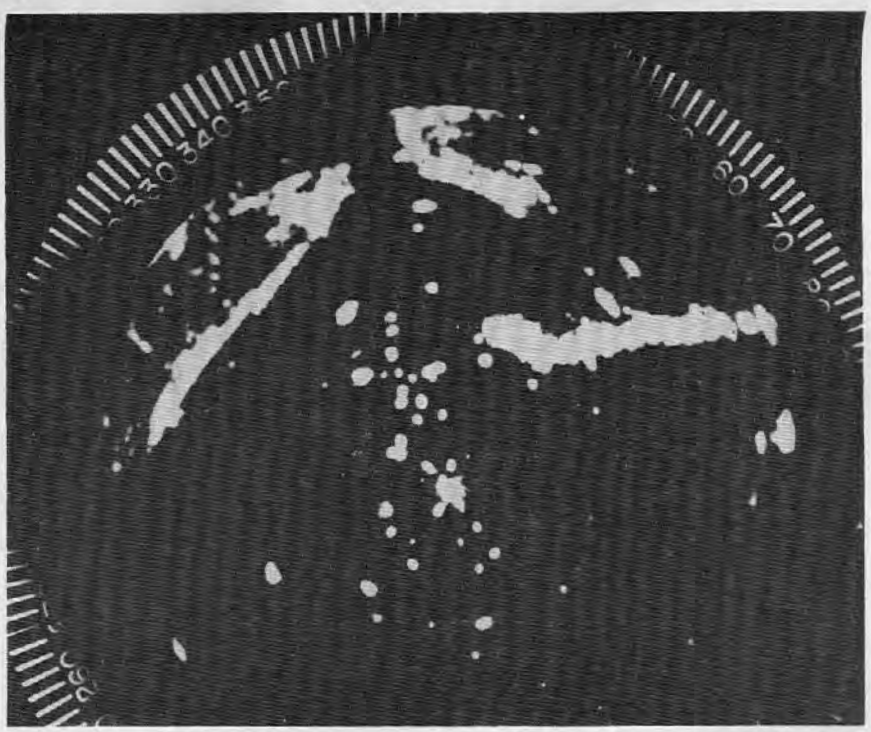

Figure 2. **A picture of a plan position indicator (PPI) of a radar set aboard a vessel approaching the Narrows in New York Harbor. Illuminated ring indicates true bearing from vessel.**

Supreme Court of Canada said in one of these (*Chinook-Dagmar Salen*):

If radar is to furnish a new sight through fog, then the report which it brings must be interpreted by active and constant intelligence on the part of the operator.

5. Is radar a substitute for a visual look-out, or any other requirement of good seamanship?

That a vessel must maintain a good look-out has been called by the courts "the first rule of the Admiralty." The necessity for a proper look-out is recognized by Rule 29 of the Rules of the Road at Sea, the rule of good seamanship.

The decisions make it clear that the posting of a visual look-out may not be dispensed with in the case of a radar-equipped vessel.[8] Thus, in the *Anna Salem*, the Court said:

As I mentioned at the outset of this judgment, this is an unhappy case of collision between two well-found ships, both equipped with every modern aid to navigation, including radar. It is a melancholy reflection that the collision probably would not have happened if the ships had not been equipped with radar. These scientific installations, and particularly radar, are potentially most valuable instruments for increasing safety at sea, but they only remain valuable if they are intelligently used, and if the officers responsible for working them work them and interpret them with intelligence. That is only another way, I think, of saying that a good look-out must be maintained. A good look-out involves not only a visual look-out, and not only the use of ears, but it also involves the intelligent interpretation of the data received by way of these various scientific instruments. This collision ought never to have happened, and certainly would not have happened if both vessels had made intelligent use of the scientific instruments with which they were equipped.

6. Is a position obtained by radar an "ascertained" position within the meaning of Rule 16 of the Rules of the Road at Sea?

The second part of Rule 16 requires a vessel hearing, apparently forward of her beam, the fog signal of another vessel, the position of which is not ascertained, to stop her engines, if the circumstances permit, and then navigate with caution until danger of collision is over.

In dealing with this problem in a recent case (the *Prins Alexander*),[9] the House of Lords had this to say:

There are obviously possibilities of error in the use of PPI. There should be, we are advised, in circumstances such as the present, continuous observation by one man and plotting of bearings if reliable inferences are to be drawn. Art. 16 stands, and it is to be noted that the new Rule which has now replaced it is in

substantially the same terms. It may be that proper observations on a PPI can ascertain the position of a vessel in the sense explained by Lord MacMillan. They clearly did not do so in this case so far as the N. O. Rogenaes is concerned.

RADAR IN FOG

It appears from this quotation that the House of Lords recognizes the theoretical possibility of a radar position being an "ascertained" position. However, as a practical matter, if a radar vessel should fail to stop her engines upon hearing a fog signal apparently forward of her beam, it is difficult to see how she could convince a court that the position was in fact an "ascertained" position, and that she was therefore without fault for a collision following her failure to stop.

Radar has a minimum as well as a maximum range. Weather and "sea return" affect the "picture" shown on the scope. Small objects are difficult to detect, and wooden vessels sometimes give poor "echo".[10] Bearing these and radar's other limitations in mind, and remembering how deceptive fog signals can be, how can a navigator possibly be said to have *ascertained* that the fog signal from a vessel which he cannot see with his eyes has been sounded by a vessel which the radar scope indicates is going to pass clear? There is no rule of the road which has been more stringently applied than Article 16.

Unless certainty exists, the engines must be stopped, and stopped at once. Otherwise, the navigator acts at his peril and his vessel will be held at fault if collision follows.[11] While there is a possibility, however remote, that the signal is from a vessel within the minimum range of the radar's effectiveness, or from a target obscured because of "sea return" or because of a "blind spot", or for any other reason, there would seem to be a violation of Article 16 if the engines are not stopped immediately.

7. In fog or other areas of limited visibility, does the use of radar permit a vessel to proceed at a speed which would otherwise be considered immoderate?

This question is perhaps the most important of all.

The first part of Rule 16 requires "moderate" speed in fog. The courts recognize that "moderate" is a relative term. It means one speed in light fog and another in heavy. Likewise, it means one speed for a highly maneuverable vessel, and another for a vessel with poor backing power. Taking both of these variables into account, the courts have generally interpreted "moderate" speed to mean a speed sufficiently low to permit the vessel to take her way off (by stopping and backing) within half the limit of visibility.[12]

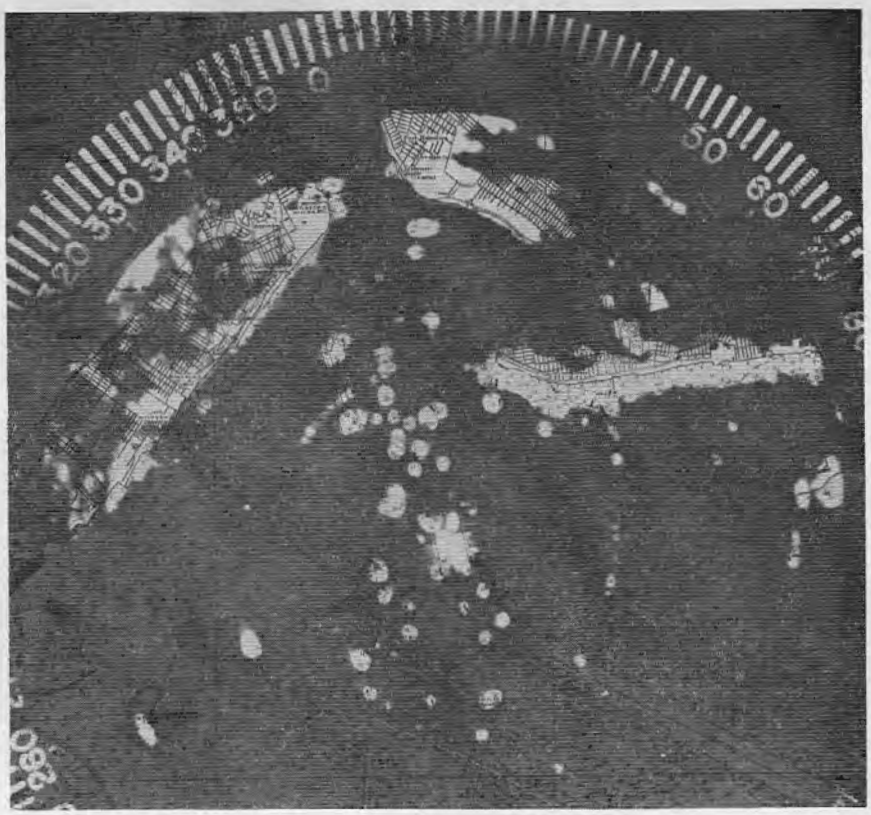

Figure 3. **A combination picture of *Figures 1 and 2*. The radar picture is superimposed over a picture of the chart to give a graphic reproduction of a high resolution radar as found aboard merchant ships. The vessel is located in the center of the plan position indicator, which shows the navigator land mass, channel markers, and other watercraft as "pips" which lie around his vessel within the range of his radar setting.**

It is common knowledge that most radar-equipped vessels, and particularly passenger and cargo liners, which operate on fixed schedules, pay scant heed to this interpretation of Article 16.

SHIP SPEED WITH RADAR

No case thus far decided has squarely held that a radar-equipped vessel must proceed slow enough to be able to take her headway off within half the limit of visibility. Nevertheless, it may be gathered from the decisions that a vessel exceeding such a speed will be held at fault if a collision results.

A typical case is the *Southport*,[13] where the Court stated the proposition in this way:

> The point raised by Mr. Hayward (the *Southport's* proctor), namely, that a speed in fog which would in ordinary circumstances be regarded as excessive may still be a moderate speed under Article 16 of the Regulations for a vessel fitted with radar, will, no doubt, have to be decided in some future case. The proposition seems to me to involve at least an assumption that a vessel fitted with radar in fact makes proper use of the apparatus with which she is fitted. I am satisfied in the present case that those on board the *Southport* who were concerned with the radar apparatus made no proper use of their instrument, and are consequently not entitled to rely upon the fact that they had facilities, of which they made no intelligent use, to excuse them for proceeding in thick fog at a speed which, but for the existence of such facilities, would have been highly excessive. It seems to me, moreover, that if Mr. Hayward's proposition were accepted to the full, while a vessel equipped with radar might escape blame for proceeding at high speed in fog, she would quite probably be found to blame if a collision ensued for failing to keep a good lookout on her radar screen. In the present case I prefer to find the *Southport* to blame for initial speed and for retaining an excessive speed until she heard the whistle of the *Finborg*.

In the more recent case (the *Chusan*),[14] there was no continuous watch maintained on the radar screen and the *Chusan* was not aware of the other vessel's presence until her signal was heard. In holding the *Chusan* one-fourth to blame, the Admiralty Division of the High Court of Justice stated:

I have come to the conclusion that for a vessel of this character, navigating in this area in these conditions of visibility, and in circumstances in which a continuous watch was not being kept on the radar, a speed of seven knots was excessive. I find no other fault with the *Chusan*, but I do not see that I can avoid concluding that the excessive speed of the *Chusan* was a factor contributing to the collision.

* * * I wish to make it abundantly clear that what I have said is not to be interpreted as meaning that a vessel which does maintain a continuous watch on her radar is thereby entitled to proceed at an excessive speed in fog. I hope that nothing I have said in this case can be twisted round and used in future cases in such a way that it may seem to justify a speed which would otherwise be excessive, merely on the basis of a continuous watch being maintained on the radar set. I approach the matter in this way. It seems to me part of any seaman's duty, in the exercise of reasonable care, to take full advantage of any equipment with which his vessel is equipped. After all, a radar set is not the only kind of equipment with which one expects a modern steamship to be supplied. It is the fact that this equipment is supplied to be used, and used intelligently; but I am far from saying that the use of this equipment can be prayed in aid so as to justify navigation that would otherwise be reckless.

MODERATE SPEED RULE

The *Bucentaur*-the *Wilson Victory* [15]—is a good illustration of the reasons why the "half limit of visibility" interpretation of the moderate speed rule should not be modified in the case of a radar-equipped vessel. I quote from the opinion:

That fifteen knots was not a reasonable speed under the prevailing conditions is perhaps demonstrated by action taken four hours earlier, at 2332, when fog became thick. At that time the captain ordered engines half ahead. Thus, the standard of prudent conduct was set by the master himself. Why wasn't the same caution exercised shortly before the collision under similar, if not more difficult, weather conditions?

There is upon this record no plausible explanation for failure to exercise the same caution displayed earlier when the *Wilson Victory* was slowed down in heavy fog unless we accept the pilot's statement that considerable reliance was placed upon radar. Although the captain disavowed such reliance, the pilot admitted that if radar had not been in operation speed would have been reduced. True it is that at 0342 a ship was seen through the radarscope three miles off the port quarter, but the rapidly deteriorating weather and the known presence of low-lying fishing vessels in the area did not warrant maintaining speed at fifteen knots because radar was in operation. Radar is an aid, not a substitute, for prudent seamanship. Respondent's expert conceded that the radar model on the *Wilson Victory* could readily miss low-lying ships or fishing trawlers such as the *Bucentaur*. The fact is that radar did not pick up the *Bucentaur* before it was struck.

Unless and until radar is made foolproof, and unless and until all vessels are required to have and use radar equipment, the interpretation which the courts have already put upon the first part of Article 16 will probably remain unchanged, and a vessel, even if radar-equipped, will be condemned for violating the rule if her speed in fog is such that she cannot stop within half the limit of actual visibility.

It may be fitting to close with the language of the Court in the *Hindoo*-the *Australia Star*,[16] one of the earliest radar decisions:

The notion that a ship, equipped with radar, may, once her navigation and range lights are bright, plunge through the seas at 15 knots in the hope that all other craft will keep clear of it cannot be accepted as a rule of safe and prudent navigation. * * * It has been suggested that to hold the *Australia Star* at fault is to penalize her because of her equipment with radar. That is a misconception. The conduct which is regarded as negligent on the part of a person of sound vision is not the same as that which is condemned when practiced by the blind. The fault of the *Australia Star* is that she chose to remain blind when she had the means to see.

Prudent navigation involves taking advantage of all the safety devices at hand. Insofar as it is the judicial function to fit scientific discoveries into the framework of laws not tailored to their measures, the function should be carried out with an eye to the general purposes of the law, and to desirable social ends.

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[1] 86 U. S. 125.

[2] See the *Davila*-the *Wilkes*, 88 F. Supp. 158, 1950 A. M. C. 631 (D. Mass.), where the Court found that a destroyer was not deficient for lack of navigational radar equipment in 1942. Compare the *Chusan* (1955) 2 Lloyds List L. R. 685 (Adm. Div.), where the Court said that one could "except" to find a modern vessel equipped with radar.

[3] (E. D. N. Y.) 1946 A. M. C. 795. For discussions of this case, see 32 Cornell L. Q. 570; 33 Virginia L. Rev. 71; 21 Tulane L. Rev. 106; "Radar and the Regulations for the Prevention of Collisions at Sea", by Capt. G. C. Saul, F. R. A. S., A. I. N. A., published in the 1947 Journal of the Honourable Company of Master Mariners, p. 610, and "Radar and the Rule of the Road", by Capt. W. H. Coombs, C. B. E., published in the 1949 Journal, p. 46.

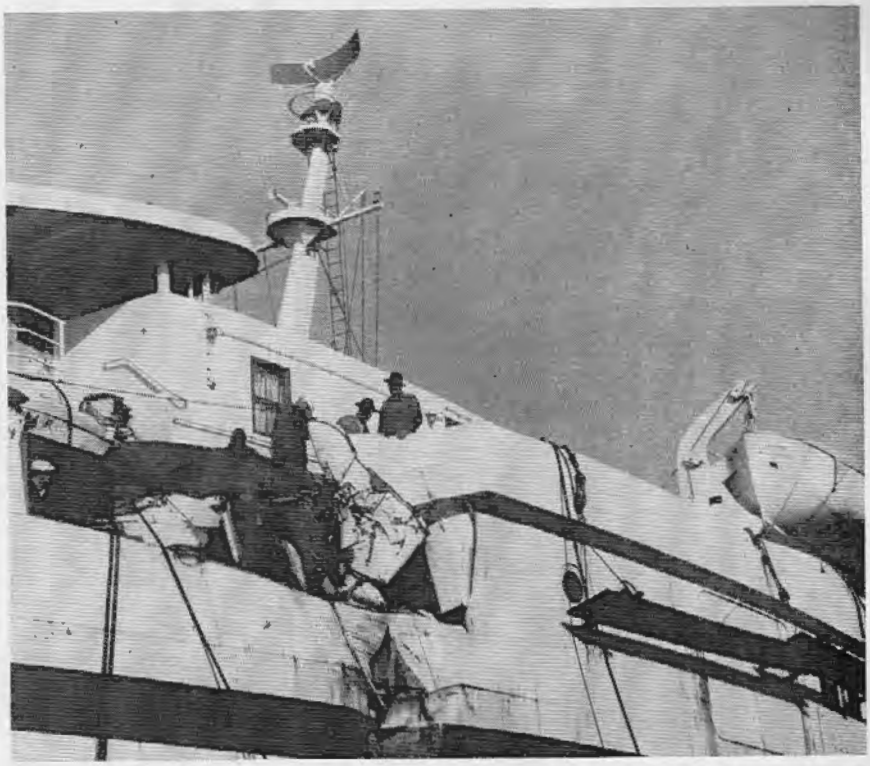
[4] 131 F. Supp. 712 (E. D. Va.), Aff'd (C. C. A. 4) 1956 A. M. C. 275.

[5] (1955) 1 Lloyd's List L. R. 429.

[6] (D. Mass.) 94 F. Supp. 486, 1950 A. M. C. 1771.

[7] The *Southport* 82 Lloyd's List L. R. 862 (Adm. Div., 1949); the *Meteor* (E. D. Mich.) 121 F. Supp. 830, 1954 A. M. C. 1921; the *Chinook*-the *Dagmar Salen*

(*Continued on page 13*)



RADAR EQUIPPED: Port side view of the MV *Chinook* after collision in the Puget Sound. Note radar mast and antenna with unobstructed sweep of the horizon.

nautical queries

Q. a. What is the minimum number of tucks in an acceptable thimble or loop splice in wire rope for use as cargo gear?

b. What precautions must be taken in splicing nylon or other plastic type rope with a slippery surface and high elasticity?

A. a. A thimble or loop splice in any wire rope shall have at least three tucks with a whole strand of the rope and two tucks with one-half of the wires cut out of each strand; provided that this requirement shall not operate to prevent the use of another form of splice which can be shown to be as efficient as that described.

b. In splicing nylon or other plastic type rope with a slippery surface and high elasticity, more tucks must be taken than with manila, or in the case of a long splice, more of the rope unlaid in making the splice.

Q. From where shall the settling-tank fuel oil shut-off valves be controlled?

A. The shut-off valves at the tank shall be remotely controlled from a readily accessible and safe location outside of the compartment in which the valves are located. If the valves are installed on the inside, additional local control shall be provided in the machinery space at the fuel-oil settling tanks.

Q. What installation test shall be made on new fuel oil discharge piping?

A. Fuel oil discharge piping between the pump and the burners shall be hydrostatically tested in the presence of an inspector at a pressure of 1½ times the maximum pressure but not less than 500 pounds per square inch.

Q. How is the extent of deterioration determined in Scotch boilers which have been in service for 10 years?

A. At the first annual inspection after a Scotch boiler has been installed for 10 years, such boilers shall be drilled or gauged at or near the waterline and bottom, and at such other places as the Marine Inspector considers necessary, for the purpose of gauging the shell to determine the extent of deterioration. Alternatively, a method of nondestructive examination such as the use of ultrasonic or other acceptable means may be used.

Q. How shall repairs be made on boilers in which the heads of rivets or stay bolts have become deteriorated?

A. Deteriorated rivets or staybolts shall be replaced.

NAUTICAL PUZZLE

Q. Every day at 8 a. m. a vessel sails from New York and Liverpool. It takes eight days to make a one-way trip, and each vessel spends 24 hours in port. How many vessels will your ship pass between New York and Liverpool?

(See answer on page 15)

Q. What welders are allowed to make repairs to a boiler?

A. Only welders who have been examined and certified as to their qualifications by the U. S. Coast Guard, American Bureau of Shipping, or the Bureau of Ships of the Navy Department, and hold a certificate which is still in force.

Q. Describe the original tests made upon new arc or gas-welded pressure vessels.

A. Arc or gas-welded vessels which have been both stress-relieved and radiographed shall be hydrostatically tested to not less than 1½ times the maximum allowable pressure for a sufficient time to permit an inspection of all joints and connections. Welded vessels which have not been stress relieved and radiographed shall be given a thorough hammer or impact test and following the hammer test, the vessels shall be hydrostatically tested to 1½ times the maximum allowable pressure.

Q. What is the minimum permissible diameter vent piping for fresh water tanks; water ballast tanks; and fuel oil tanks?

A. The diameter of each vent pipe shall not be less than 1½ inches for fresh water tanks, 2 inches for ballast water tanks, and 2½ inches for fuel oil tanks.

Q. Why are vent pipes required to be covered with corrosion-resistant wire screens and what care should be given these screens?

A. They are covered with corrosion-resistant wire flame screens to prevent an explosion in the tank or hold, should there be a fire on deck around the vent pipe. Fire or a flame cannot penetrate the wire mesh, and in this way the tank is protected. It is necessary, therefore, to keep the screen clean and see to it that no breaks appear anywhere on the surface of the screen. Should there be a break, the screen should be replaced instead of repaired. Repairing would restrict the area of the opening and cut down on ventilation.

Q. a. What is the minimum thickness of wood to be used for hatch boards on weather deck hatches?

b. What is the minimum number of tarpaulins required for covering hatches, and what is the minimum grade of the material to be used?

A. a. Two and three-eighths inches.

b. Two tarpaulins, thoroughly waterproofed and of ample strength; guaranteed free from jute. They shall be not less than No. 4 cotton canvas or No. 6 hemp canvas before waterproofing.

INSPECTION DUTIES: A Coast Guard Marine Inspector is shown above checking the muster list of a lifeboat crew on a large American flag passenger vessel. This is one of the duties merchant marine officers who are commissioned in the Coast Guard will be called upon to perform.

PUBLIC LAW 219 EXAMS

Opportunities for qualified merchant marine officers to win Coast Guard commissions in forthcoming revised examinations throughout the United States and Territories was announced recently in Washington, D. C.

Specific details were published in the August issue of the PROCEEDINGS, but Coast Guard officials emphasized the requirements stress practical subjects in line with current license examinations. The physics and chemistry parts have been dropped.

Of particular interest to seagoing personnel is the revised schedule of examinations. Heretofore a three-day schedule was set up once a year. Now an applicant can designate the date and place where he wishes to sit for the examinations within a three-month period. Information sheets are being distributed by Coast Guard Shipping Commissioners and local Marine Inspection offices which should answer most of the vital questions. This pamphlet indicates type of sea service creditable, examination centers, minimum qualifications, training, future assignments, and career opportunities and advantages.

Application blanks may be obtained from any Coast Guard Marine Inspection Office or District Office. Upon completion they should be forwarded to the Commandant (PTP-2), U. S. Coast Guard, 1300 E Street, NW., Washington 25, D. C.

MERCHANT MARINE STATISTICS

There were 1,094 vessels of 1,000 gross tons and over in the active ocean-going U. S. merchant fleet on November 1, 1956, according to figures released by the Maritime Administration, U. S. Department of Commerce.

This figure includes 51 Government owned vessels in active service, and shows an increase of four ships over the October total. Completion of one Mariner ship conversion and an order for an additicnal tanker for foreign flag left the total of merchant vessels being built or under conversion at 58. Shipyard employment, based on major commercial construction and conversion contracts, was set at 10,796. Seafaring jobs on active U. S. flag ships, excluding civilian seamen manning Military Sea Transportation Service ships, totaled 57,621. Men in training at State Maritime Academies and the U. S. Merchant Marine Academy showed a total of 1,983 prospective officers.

TRADITIONS OF THE SEA

The roll of American Seafarers who have performed their duties in an outstanding and meritorious manner in accordance with the highest traditions of the sea is long but never completed.

Heroism, courage, and devotion to duty are by no means restricted to salt water seafaring. Fresh water sailors have amply demonstrated a full measure of these qualities. Four river mariners who recently earned a place on the honor roll are: GASTON PATIN, HOUSTON J. CHENEVERT, BRENTON LEDET, and CAPTAIN R. C. STOLTZ. These men, by their heroic and immediate action, prevented what might have been a catastrophe.

A summary of the incident is as follows:

On 13 February 1955, at about 2:30 p. m., a fire started on *Barge BBL–104* which was discharging a cargo of lubricating oil. Within minutes the fire spread to and under the pier and across the pier to the gasoline laden *Barge No. 25*. In all there were seven barges made fast to the *Esso Standard Oil Company* of Baton Rouge refinery docks. *Barge BBL–104* was engulfed in flames when the men swung into action.

PATIN and CHENEVERT immediately entered the danger zone and cut three barges loose in addition to shouting instructions to the upper level of the wharf. After cutting the barges adrift they were unable to regain the dock and drifted off on the barges they had saved. LEDET, pilot of the MV *Iowa*, conned his tug into the very jaws of the fire to clear the pier of the remaining barges. In taking *Barge BBL–104*, which was ablaze from end to end, away from the pier he unquestionably prevented far greater damage to the docks. By moving this barge, the principal source of the flame was removed, thus enabling fire fighters to effectively combat the blaze. CAPTAIN STOLTZ, superintendent of *Esso Inland Waterways Division*, chopped the lines holding the blazing barge.

In answer to calls for aid the following tugs responded at top speed: *Sarah Kate, Irene Chotin, Zeus, Captain George,* and *Ora D.* Full credit must be given to the crews of these boats for maneuvering loaded gasoline barges from the scene of the fire.

Quick thinking and positive action of these men, far in excess of any ordinary call of duty, was in keeping with the highest traditions of the United States Merchant Marine.

LESSONS FROM CASUALTIES

BOOMS AWAY!

ALTHOUGH no lives were lost, a recent casualty aboard a Victory type vessel in Honolulu has again shown the necessity for supervision over routine shipboard functions.

In this case the deck department was securing a 30-ton heavy lift boom at #4 hatch. The bosun was directing the operation and handling the winch controls for the topping lift winch. As the boom neared the vertical, the two men stationed aloft shouted for him to stop. Apparently he did not hear the warnings and continued to heave in. The three-quarter inch wire parted under the terrific strain and the boom crashed to the deck below. Fortunately, all hands scrambled to safety and no one was injured. Repairs to the boom were necessary and a new topping lift wire had to be rove.

In essence, once the hauling part passed a 90° angle with the boom it was pulling against itself. Further strain exerted by the powerful winch "two blocked" the gear and the wire gave way. (*See Figure 1.*)

Seamen who secure cargo booms in a vertical position should recognize the simple mechanics involved and utilize some sort of "hogging" line to work the boom into position. On light gear a line passed around the boom should suffice. On heavier booms, or under awkward circumstances, a small block and tackle arrangement or a line led to a winch should do the trick.

No doubt the bosun was an experienced man, but his attempts to supervise and manipulate the winch controls at the same time were ill advised. His station should have been where he could have observed all phases of the operation.

No better example of the tremendous lifting power of heavy lift winches can be found than the cases involving two Mariner vessels. These ships literally pulled the topping lift swivel brackets off their foundations. (*See figure 2.*)

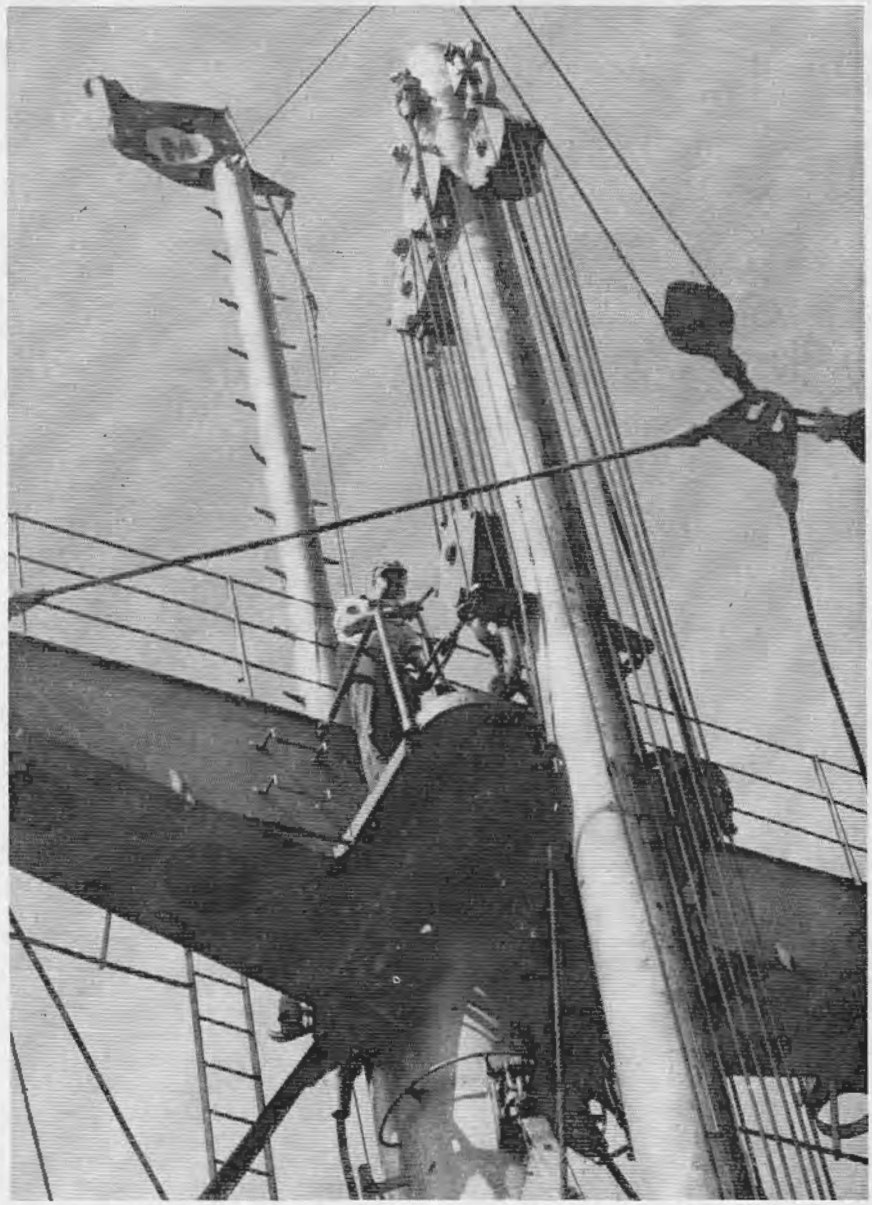


Figure 1. Seaman shown aloft preparing to let go turnbuckles securing 30-ton boom on Victory type vessel. Note number of parts at moving block.

Figure 2. Closeup shows topping lift swivel bracket pulled off its foundation.

In both cases the topping lift winches were operated *after* the boom was topped—due to inadvertent operation of the equipment. Modifications have been made to the clutch assembly on the heavy lift winches, but ship's officers must assure themselves no unnecessary use of the winch is made after the boom nears the vertical.

On these Mariner vessels the fillet welds attaching the swivel bracket to the kingpost truss plate carried away when power was applied to the topping lift hauling part. A graphic example of the forces involved. Treat all topped booms, particularly heavy lift gear, with extra caution.

HEADING FOR TROUBLE

In any discussion of casualties there always exists the possibility, "There, but for the grace of God, go I." There are times, however, when an incident occurs which goes beyond the realm of such a conclusion. Here's such a one.

Imagine, if you can, a new, full bodied and well found T–2 tanker stranded on a beach more than 200 miles from its dead reckoning position! Three mates had stood their watches and not one had checked the magnetic compasses located in the wheelhouse and flying bridge. Not one had thought the sudden "shift of the wind" had had any bearing on the possibility that the vessel had made a radical change of course. Failure to cross the Gulf Stream as anticipated with its marked rise in water temperature caused no alarm. No one thought the presence of small fishing craft "so far at sea" unusual.

For 12 hours the vessel boiled along at 14 knots from the Delaware River on what she thought was a trip to South America. In reality the vessel was headed for Long Island, New York. (*See Figure 1.*)

Shortly after taking departure the vessel steadied upon 118° by gyro compass, which, based on comparisons made under pilotage, was considered a true heading. Ten minutes after this course was set the gyro repeater system failed. The repeaters froze on 118°. In approximately fifteen minutes the temporary derangement had corrected itself so the repeaters were again functioning, but were out of synchronism with the master gyro compass.

The repeaters continued to indicate a heading of 118° although the vessel had actually swung 111° to the left and was making 007° true—straight for Fire Island.

About the time of the malfunction the ship was in the neighborhood of the "Baltimore Canyon" where depths fall sharply from 50 to over 500 fathoms. A flip of the fathometer switch would instantly have revealed to the officers something was radically wrong. Such was not to be. The vessel plowed on.

A seaman steering by the gyro repeater had thought it was unusual that the heading did not change for almost 15 minutes but he failed to report it to the mate on watch. The wind now was logged from the starboard bow about two points forward of the beam. Previously the wind had been noticed on the port bow, but this vital clue to a large change of course was passed off as an unexpected change in wind direction. The sky was overcast and the sun was not visible.

No use was made of the radio direction finder in the belief the ship was standing offshore and in no danger. The Master had left specific instructions on this and previous voyages that the compasses "must be checked at least once each watch." It was admitted at the hearing later that complete confidence was placed in the gyro repeaters, but it borders on the fantastic that not one of the mates made a comparison between the gyro and magnetic compasses.

The second mate stood the 12–4 watch without making a check and passed the watch along without mentioning the magnetic course. The 4–8 mate stood his watch for four hours and was relieved, and again the course being steered by magnetic compass was completely overlooked. The 12–4 officer returned for his 0000–0400 stint the following morning, and still not one man had peered into the hooded wheelhouse compass or checked the standard compass on the flying bridge.

It must have been something of a shock for the men in their bunks, dreaming of the bright lights and gay spots of South America, to be awakened by the crunching of their vessel ashore on Long Island.

The Master was a man with more than 29 years experience in the same company—twenty-five of them in command. He had been in this ship for 15 months. The mates were making their second trip. The Master admitted they were all "good, bright boys," and saw no reason to remind them about compass comparison.

The value of the lesson to be learned from this casualty is obvious. This vessel plunged through the dark February seas without the Master or deck officers exercising a fundamental principle of good seamanship. DON'T LET IT HAPPEN TO YOU!

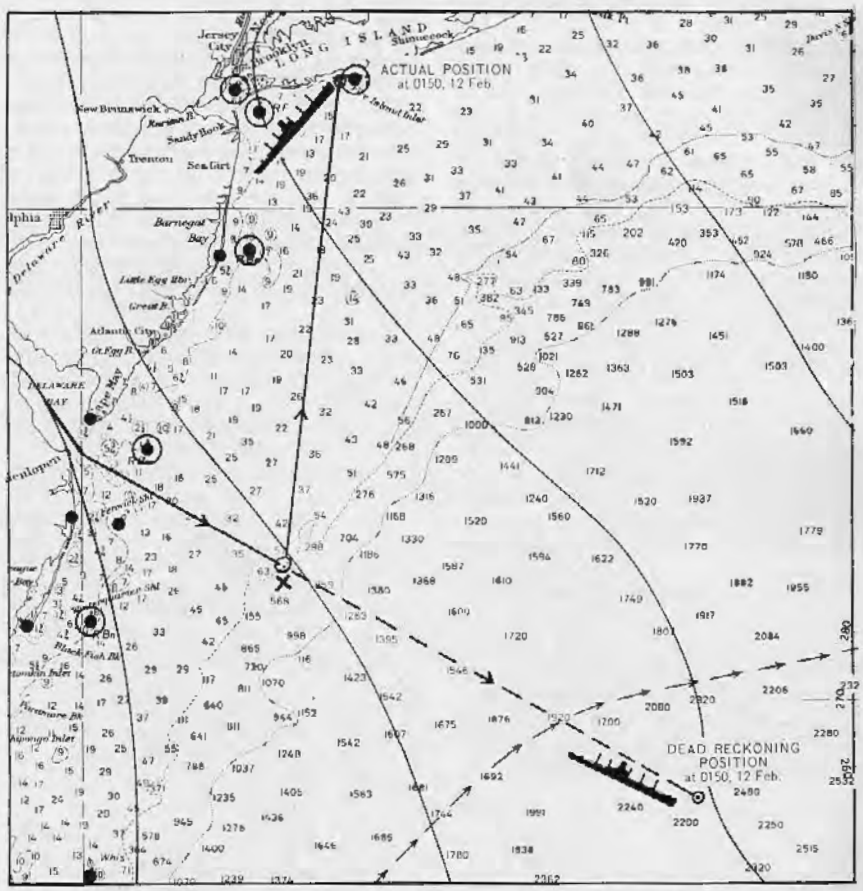


Figure 1. **This reproduced section of an East Coast chart illustrates courses followed by tanker to its stranding on Fire Island. Solid line shows courses vessel actually followed. Dotted line is course ship's officers thought vessel was on.**

DEATH BY ELECTROCUTION

By LCDR. Warren F. Stevenson, USCG

ONE of the most tragic and grief-laden accidents recently reported to the Coast Guard involved the accidental electrocution of an 11-year old boy and his young mother.

Swimming alongside a moored motorboat which was re-charging its battery, the boy felt a shock when he touched the transom. Fraught with panic, he shouted for help. A playmate tried to help, but frightened by the electric shock, left the water unharmed. The boy's mother leaped into the water to assist her son. She too became shocked and lapsed into unconsciousness. Within minutes both parent and child were dead—from electrocution! Re-charging a motorboat's storage battery is so common that almost every motorboat owner and operator could reasonably say, "I have done just that many times and I never considered it the least bit dangerous." To understand this double fatality, it is necessary to focus our attention on the events leading up to it.

On a sunny, Sunday afternoon in August a man was returning in his new 18 foot aluminum outboard motorboat from a pleasure spin in an inland lake. He was accompanied by his wife and their teen-age son and daughter. It was a fine boat, one that the father was extremely proud of. It had been purchased new by Pop only that May. The son and daughter had bought a new shiny chrome 6 inch spotlight as a birthday present for their father and had eagerly helped Pop install it. There was no doubt that the boat was the pride of the family. All except Mother, she never was too keen about boats. But none of the family seriously considered her opinions about boats. Besides, this new one was the latest, the best, the safest. After all, didn't it have a non-rusting hull made of aluminum, a windshield, a dashboard with a steering wheel, ignition switch and self-starter button just like a car, even better, like a real sporty convertible car? It was equipped with proper running lights and brand new buoyant seat cushions that Pop, who knew about such things, said must carry a U. S. Coast Guard approval tag on them. So it was a good boat properly equipped, and carefully operated.

BOAT TIED TO DOCK

The father tied his boat up carefully to the dock, putting over his new fenders, and all were going up to their cottage to have supper. He tied his boat up in a small inlet against a small old wooden dock that projected out into the water about 30 feet from the bank. A friendly neighbor permitted him to use this dock because he didn't own a boat of his own. The cottage was only about 20 feet from the water's edge. The boat being tied up, Pop decided to re-charge his storage battery. He borrowed a battery charger from a nearby owner of a boating service. This concern was a sizeable establishment furnishing docking, fuel and oil, as well as engine repair and out-of-the-water winter boat storage. As was his long established custom, he loaned his battery charger to motorboat owners gratis, feeling this service was more than compensated by the good will engendered to boating people in the area. Pop took the battery charger and hooked it up to the battery aboard his boat.

As the day was sunny, clear and dry he placed the charger, a common enough type powered by 110 volts AC and delivering 6 volts DC, on one of the wooden plyboard seats and led his connecting wires from the charger to the positive and negative terminals of the battery. The battery was in its compartment underneath a hinged section of the seat. He ran two lengths of common rubber cable from an old steel fuse box mounted on a wood stanchion near the shore end of the dock. This fuse box carried a 15 ampere fuse. The connection from this fuse box was by two wires about 12 inches in length connected to the terminals inside by screws and led outside the box through a "knockout" opening to a rubber plug which in turn received the two-pronged plug from the rubber cable. Just outside this fuse box these two short lengths of wire were bare, showing discoloration indicating that condition had existed for some time. However, they did not touch the metal sides of the fuse box. Two fabric-covered wires led through an old, partly rusted, eroded, and broken armored cable led from the nearby house along and under the ground to this fuse box. This covered wire ran close to the water's edge along the ground. Its source from the house was by another fuse box outside the house carrying a 15 ampere fuse. This latter box was energized from the 110 volt AC of the house. After hooking up his charger the boat owner left.

BOY GOES SWIMMING

In the nearby cottage from which the electric current was led to the charger, another family was at home. The 11 year old son went swimming in the water in front of this house alongside the dock and tied-up boat. After swimming around for a short time he reached up and immediately felt an electric shock. He screamed for help. Another boy about his age upon hearing his cries jumped in. As he swam over near the boy hanging by his hands onto the stern transom of the boat, he in turn felt an electric charge, became alarmed and swam back to the shore without touching either the other boy or the boat, thus saving himself from injury.

In the meanwhile the mother of the boy calling for help jumped into the water, reached for her son and grabbed for the transom of the boat. She in turn became shocked by an electric charge. Both became unconscious, the boy letting go of the boat and disappearing under the water. The mother was grabbed by a neighbor and held up by the arms with her head out of water. The electric cord was disconnected and the mother was brought onto the wooden dock. Efforts to revive her with a pulmotor proved unsuccessful. The boy's body was recovered by dragging a half hour later.

CHANCES FOR A COMEBACK

For the statistical-minded the American Red Cross has listed chances for recovery from drowning and electrical shock by use of artificial respiration. Stress has been placed on the fact that it may take three to four hours before signs of recovery are apparent in severe electrical shock. In the case of drowning, signs of recovery should appear after approximately 25 minutes.

After breathing has stopped and artificial respiration started, the chances for recovery are:

1 minute after breathing has stopped it's 98 out of 100.
2 minutes after breathing has stopped it's 92 out of 100.
3 minutes after breathing has stopped it's 72 out of 100.
4 minutes after breathing has stopped it's 50 out of 100.
5 minutes after breathing has stopped it's 25 out of 100.
6 minutes after breathing has stopped it's 11 out of 100.
7 minutes after breathing has stopped it's 8 out of 100.
8 minutes after breathing has stopped it's 5 out of 100.
9 minutes after breathing has stopped it's 2 out of 100.
10 minutes after breathing has stopped it's 1 out of 100.
11 minutes after breathing has stopped it's 1 out of 1000.
12 minutes after breathing has stopped it's 1 out of 10,000.

All of this occurred within one hour of the return of this boat to its dock. How long an hour—2 people dead, 2 more children at home—motherless. The Coroner certified death—not by drowning, but by electrocution.

The reasons for these deaths were not readily apparent based upon an examination of the circuits and methods used. However, it is certain that there was some path for the 110-volt current to flow through the hull of the boat to the point where the woman and boy had grasped it. It is a generally accepted fact that an electrical current as small as 90 milliamperes (.09 ampere) may be lethal when flowing through the human body (if the pathway includes the area of the heart) and that a potential of more than 12 volts may pass such a current through the natural interior resistance of the body. It is surface resistance of the body which normally protects us from lethal doses resulting from accidental contacts with live terminals. If the skin is dry, this surface resistance may be as high as a million ohms and little current will flow. However, with wet hands and the body immersed in water as in the tragic case above, the surface resistance may fall to a few ohms and large current could flow, a current well above the lethal limit.

BOAT CLEAN AND DRY

This metal boat had wooden plyboard seats and flooring—all new, clean and dry, with no oil spillage visible. These seats rested on aluminum side pieces attached to the wooden flooring with no direct metallic connection to the metal skin of the boat. The interior of the boat was dry at the time. Suspicion was attached to the old deteriorated armored cable which could certainly have been easily grounded if the outside condition was any clue to the condition of the leads inside, but there was no apparent path from this cable to the metal hull of the boat. The 10-year old rectifier tube-type charger was intact, as was the 15-ampere fuse at the terminal box on the dock, indicating no excessive current had flowed.

In analyzing possible paths for flow of the 110-volt current to the metal hull, two clues were apparent. These were: (1) The method of construction of some of the earlier rectifier tube battery chargers whereby, if the two leads to the power source were connected in one way, the full power source voltage existed at one of the charger output terminals (if the two leads were connected the other way, this was *not* true), and (2) the method of wiring the electric self-starter on this outboard motorboat utilized the metal hull of the boat for one side of the circuit from the battery, to starter switch, to starter solenoid, and back to the battery. Therefore, if the charger was connected to the power source in the former (improper) manner, a full 110 volts could have existed at one of the storage battery terminals and if this battery terminal was the one grounded to the boat's metal hull to complete the starting circuit, 110-volt potential existed at the point of connection to the hull.

Fresh water is normally a poor conductor if it is relatively free of minerals and other impurities. With a 110-volt potential in the metal hull there would be little current flow to ground through the fresh water, certainly not enough to blow the 15-ampere fuse on the dock. However, with a person standing on the bottom in the shallow water and touching the metal hull with wet hands, his body would form a good path for current to flow to true ground and, with so little surface resistance, a lethal current of 90 milliamperes or more could flow and still not blow the 15-ampere fuse. It is believed that this is the most logical explanation of the manner in which the boy and mother in this case received fatal doses of electrical current.

The moral of our unhappy tale seems plain—don't lead wires carrying 110-volt current aboard a metal boat, especially if there are swimmers nearby. Take the battery, or whatever else is in need of 110-volt current, away from the metal boat where a stray ground will not set up a dangerous condition. No matter how safe your hookup seems to you, remember that a metal hull is an excellent conductor and that electrical potential can be silent and invisible until the moment the damage is done—and that may be too late.

RADAR

(Continued from page 7)

(Supreme Court of Canada) 1951 A. M. C. 1253; the *Anna Salem* (1954) 1 Lloyd's List L. R. 475 (Adm. Div.)

[8] The *Bucentaur*-the *Wilson Victory* (S. D. N. Y.) 125 F. Supp. 42; the *Anna Salem* (1954) 1 Lloyd's List L. R. 475 (Adm. Div.); the *Triton-the Baranof* (Exchequer Court of Canada) 1953 A. M. C. 393.

[9] (1955) 2 Lloyd's List L. R. 1, see, also, the *Anna Salem* (1954) 1 Lloyd's List L. R. 475 (Adm. Div.)

[10] "Electronic Navigational Aids" pp. 44–5. Published by the United States Coast Guard, 1945.

[11] The *Selja*-the *Beaver*, 243 U. S. 291.

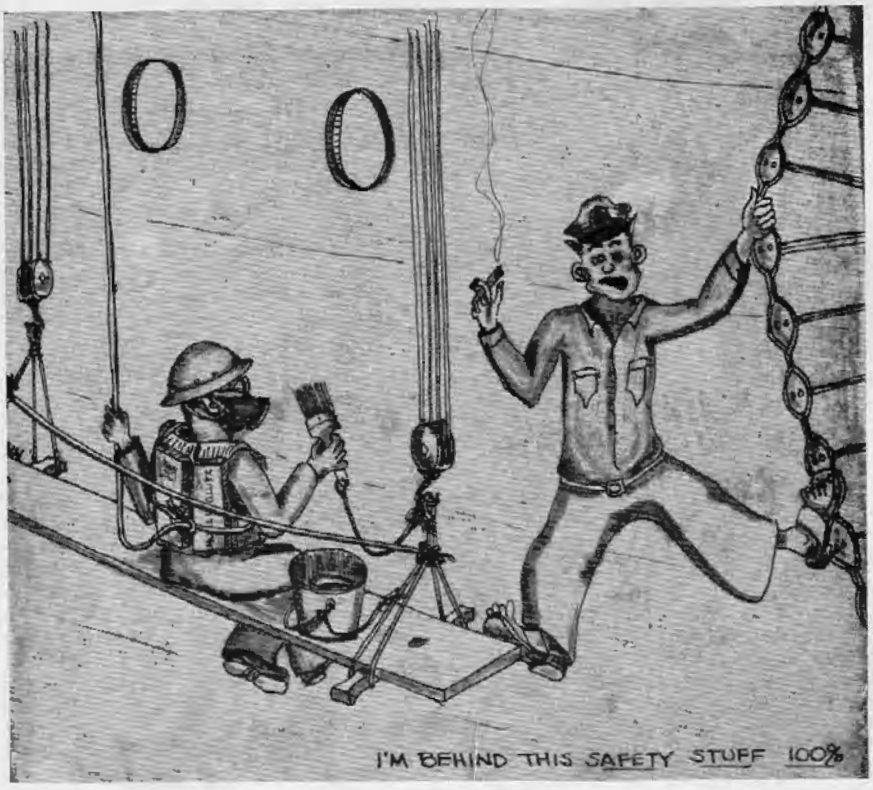
[12] The *Umbria*, 166 U. S. 404.

[13] 82 Lloyd's List L. R. 862 (Adm. Div., 1919).

[14] (1955) 2 Lloyd's List L. R. 685 (Adm. Div.).

[15] (S. D. N. Y.) 125 F. Supp. 42, 1955 A. M. C. 142.

[16] (C. A. 2) 172 F. 2d 472, 1949 A. M. C. 423, cert. denied, 338 U. S. 823.



APPENDIX

AMENDMENTS TO REGULATIONS

[EDITOR'S NOTE.—The material contained herein has been condensed due to space limitations. Copies of the Federal Registers containing the material referred to may be obtained from the Superintendent of Documents, Washington 25, D. C.]

TITLE 46—SHIPPING

Chapter I—Coast Guard, Department of the Treasury

Subchapter B—Merchant Marine Officers and Seamen

[CGFR 56-53]

PART 10—LICENSING OF OFFICERS AND MOTORBOAT OPERATORS AND REGISTRATION OF STAFF OFFICERS

PART 12—CERTIFICATION OF SEAMEN

LICENSING, REGISTERING, AND CERTIFICATING MERCHANT MARINE PERSONNEL

Notices regarding proposed changes in the navigation and vessel inspection regulations were published in the Federal Register dated March 1, 1956 (21 F. R. 1350–1356), and March 28, 1956 (21 F. R. 1901, 1902), as Items I through XVIII of the Agenda to be considered by the Merchant Marine Council at a public hearing, which was to be held on April 24, 1956, at Washington, D. C. This document is the fifth of a series of documents covering the regulations considered at this public hearing. The first two documents contain Dangerous Cargo Regulations. These Dangerous Cargo Regulations were published in the Federal Register dated September 20, 1956 (21 F. R. 7053–7142). The third document contained miscellaneous amendments to the chapter and it was published in the Federal Register of September 6, 1956 (21 F. R. 6708–6713). The fourth Federal Register document contains miscellaneous marine engineering and electrical engineering amendments and is being processed for printing.

All the comments, views, and data submitted in connection with the items considered by the Merchant Marine Council at this public hearing have been very helpful to the Coast Guard and are very much appreciated. On the basis of the information received, certain proposed regulations were revised and others are being held in abeyance pending further study. This document contains amendments to the regulations which are based on Item I in the Agenda.

The proposals to revise 46 CFR 10.05–3, 10.05–5, 10.05–46, and 10.05–47, with respect to establishing limited ocean and coastwise licenses as master of small passenger vessels of less than 100 gross tons, are not included in this document. Action on these proposals will be held in abeyance pending further study of the problems involved.

The proposed amendments to 46 CFR 10.02–7, 10.02–9, and 10.02–13 to bring these regulations up to date and to reflect current practices are adopted without any changes.

With one exception, the other proposals in Item I are adopted without any change. With respect to the physical requirements for obtaining a certificate as tankerman, the proposal to amend 46 CFR 12.20–3 (b) was revised by changing the phrase "original license" to "original license as engineer."

By virtue of the authority vested in me as Commandant, United States Coast Guard, by Treasury Department Order No. 120, dated July 31, 1950 (15 F. R. 6521), and Treasury Department Order 167–14, dated November 26, 1954 (19 F. R. 8026), to promulgate regulations in accordance with the statutes cited with the regulations below, the following amendments are prescribed and shall become effective on the date of publication in the Federal Register.

Subchapter N—Explosives or Other Dangerous Articles or Substances and Combustible Liquids on Board Vessels

[CGFR 56-47]

PART 146—TRANSPORTATION OR STOWAGE OF EXPLOSIVES OF OTHER DANGEROUS ARTICLES OR SUBSTANCES AND COMBUSTIBLE LIQUIDS ON BOARD VESSELS

MISCELLANEOUS AMENDMENTS

A notice regarding proposed changes in the navigation and vessel inspection regulations was published in the Federal Register dated September 22, 1956 (21 F. R. 7250, as Items I through III on the Agenda to be considered by the Merchant Marine Council, and a public hearing was held on October 15, 1956 at Washington, D. C. This document is the first of a series of documents covering the regulations considered at this hearing.

All the comments, views and data submitted in connection with the items considered by the Merchant Marine Council at this public hearing have been helpful to the Coast Guard and are much appreciated. This document contains amendments to the regulations which are based on Item III in the Agenda.

The various amendments to the Dangerous Cargo Regulations in 46 CFR Part 146 have been petitioned for by various shippers, carriers and the Department of Defense. The amendment to 46 CFR 146.23–35 changes the requirement for rubber lining for certain sulfuric acid tanks from ¼ inch thickness to 3/16 inch thickness. The amendments to 46 CFR 146.27–25 and 146.27–100 provide for stowage of small arms ammunition without explosives loaded bullets (ICC Class C explosives) in holds above, below and adjacent to one in which cotton is stowed; and for the shipment of two one-pint metal containers of touch-up enamel in automobiles being exported.

The amendments to Rules and Regulations for Military Explosives (CG–108) (46 CFR 146.29–100) permit shipment of certain fuzes as Class III military explosives, and permit overstowing Class IV–B military explosives with non dangerous cargo and permitted military explosives.

By virtue of the authority vested in me as Commandant, United States Coast Guard by Treasury Department Order No. 120, dated July 31, 1950 (15 F. R. 6521), and Treasury Department Order No. 167–14, dated November 26, 1954 (19 F. R. 8026), to promulgate regulations in accordance with the statutes cited with the regulations below, the following amendments are prescribed and shall become effective on the date of publication of this document in the Federal Register.

(Federal Register of November 17, 1956)

TITLE 46—SHIPPING

Chapter I—Coast Guard, Department of the Treasury

[CGFR 56-39]

MISCELLANEOUS MARINE ENGINEERING AND ELECTRICAL ENGINEERING AMENDMENTS

Notices regarding proposed changes in the navigation and vessel inspection regulations were published in the Federal Register dated March 1, 1956 (21 F. R. 1350–1356), and March 28, 1956 (21 F. R. 1901, 1902), as Items I through XVIII of the Agenda to be considered by the Merchant Marine Council at a public hearing, which was to be held on April 24, 1956, at Washington, D. C. This document is the fourth of a series of documents

covering the regulations considered at this public hearing. The first two documents contain dangerous cargo regulations and the third document contains miscellaneous amendments to 46 CFR Chapter 1.

All the comments, views, and data submitted in connection with the items considered by the Merchant Marine Council at this public hearing have been very helpful to the Coast Guard and are very must appreciated. On the basis of the information received certain proposed regulations were revised and others rejected. The following items considered at the public hearing held April 24, 1956, as revised, are adopted and included in this document:

Item VII—Marine Engineering Regulations and Material Specifications.

Item XI—Electrical Engineering Regulations; Miscellaneous Changes and Additions.

Item XIV—Specifications for Fire Protection Systems.

Item XV—Specifications for Emergency Loudspeaker Systems.

Item XVIII—Receptacle Outlets and Attachment Plugs.

The proposal in Item XVIII of the Agenda was not changed. The necessary amendment to the regulations is in this document.

The proposals in Item VII of the Agenda regarding marine engineering are modified. With respect to nodular iron castings, a requirement regarding markings was added as 46 CFR 51.61–10. In connection with conditions of approval of boilers, the reference to 46 CFR Part 162 (Subchapter Q—Specifications) is limited to applicable requirements governing boilers. In order to have the Coast Guard and the American Society of Mechanical Engineers' requirements in agreement with respect to low pressure heating boilers, 46 CFR 53.03–75, regarding hydrostatic tests, inspection, and stamping, was revised. The major change requires that steel plate heating boilers operating at pressures exceeding 15 pounds per square inch will be subject to shop inspection by a Coast Guard marine inspector. The changes regarding unfired pressure vessels were revised to clarify requirements for air tanks used in offshore drilling operations in 46 CFR 54.01–1. The proposal regarding use of nodular cast-iron valves and fittings in 46 CFR 55.07–1 (e) (4) was revised to permit adjusted pressure ratings for temperatures not exceeding 650° F. to be authorized by the Commandant when construction does comply with 150-pound and 300-pound standards.

The proposals in Item VII dealing with pumping arrangements and piping systems are modified to agree with comments adopted. The amendment to 46 CFR 55.10–10 (b) (6) will require a sentinel valve to be fitted to an economizer when a valved bypass is installed. In view of the good ductility of Grade 60–45–15 nodular cast iron, the amendment to 46 CFR 55.10–70 (i) will permit this material to be used in sea chests and shell connections below the freeboard deck.

The proposals in Item XI of the Agenda with respect to electrical engineering are modified to reflect changes based on comments which were adopted. The proposals changed deal with emergency loudspeaker system, 46 CFR 111.05–10 (c) (4); switchboard bus bars and wiring, 46 CFR 111.35–5 (a); locations of electric propulsion control, 46 CFR 111.35–25 (g); means to start and stop motors, 46 CFR 111.45–1 (e) (2); portable electric cords, 46 CFR 111.50–15 (f) (2); enclosures in spaces where vehicles carrying gasoline are stored, 46 CFR 111.65–10 (b); and electric cooking equipment, 46 CFR 111.65–50 (b) (5) and (6). The proposal to amend 46 CFR 111.35–15 (c) (2) was not adopted. The proposals regarding emergency lighting systems for small passenger vessels in 46 CFR 112.05–15 were revised. The other proposals are adopted.

The proposals in Item XIV of the Agenda covering specifications for fire protective systems are adopted with minor changes in various details which are based on comments received. The requirements modified are in 46 CFR 161.002–6 (g) (1), 161.002–7 (b) (3) (iii) and (iv), (e) (1) and (g) (1), 161.002–8 (a), 161.002–10 (g) (8), 161.002–11 (k) (2) and (l) (6), 161.002–12 (a), 161.002–15 (e) (1) and (f) (7) (iii), and 161.002–16 (c) (4) (iii).

The proposals in Item XV of the Agenda covering specifications for emergency loudspeaker systems are adopted with minor changes in certain details which are based on comments received. The requirements modified are in 46 CFR 161.004–4 (b) (5), (f) (1) and (15), and (g) (16), 161.004–5 (a) (4), and 161.007 (b) (1).

By virtue of the authority vested in me as Commandant, United States Coast Guard, by Treasury Department Order No. 120, dated July 31, 1950 (15 F. R. 6521), Treasury Department Order 167–14, dated November 26, 1954 (19 F. R. 8026), and Treasury Department Order CGFR 56–28, dated July 24, 1956 (21 F. R. 5659), to promulgate regulations in accordance with the statutes cited with the regulations below: *It is ordered*, That:

(a) All the amendments to regulations containing specific dates shall become effective on the dates set forth in the regulations; and,

(b) All the other amendments to regulations (which are not covered by paragraph (a), above) are prescribed and shall become effective 90 days after the date of publication of this document in the Federal Register.

(Federal Register of November 21, 1956)

NAUTICAL PUZZLE

A. You will pass 17 ships.

ARTICLES OF SHIPS' STORES AND SUPPLIES

Articles of ships' stores and supplies certificated from 1 November to 30 November 1956, 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

New Process Chemical Co., Inc., 121 Clay St., San Francisco 11, Calif., Certificate No. 277, dated 2 November 1956, TRICON 129–H.

New Process Chemical Co., Inc., 121 Clay St., San Francisco 11, Calif., Certificate No. 278, dated 2 November 1956, TRICON 408.

Kor Corp., 600 West 9th Ave., P. O. Box 485, Gary, Ind., Certificate No. 279, dated 20 November 1956, "KOR" FUEL OIL CONDITIONER.

Kor Corp., 600 West 9th Ave., P. O. Box 485, Gary, Ind., Certificate No. 280, dated 20 November 1956, KO #9.

The Daniel Co., 17 Bolt St., Lowell, Mass., Certificate No. 281, dated 23 November 1956, MM–17.

AFFIDAVITS

The following affidavits were accepted during the period from 15 October 1956 to 15 November 1956:

Circle Seal Products Co., Inc., 2181 East Foothill Blvd., Pasadena 8, Calif., VALVES.

Service Foundry, Division of Avondale Marine Ways, Inc., 416 Erato St., New Orleans 13, La., CASTINGS.

Lee Brothers Foundry Co., Inc., P. O. Box 231, Anniston, Ala., FLANGES.

Sun Weld Fitting Co., 2600 Downey Rd., Los Angeles 23, Calif., FITTINGS.

U. S. Valve & Mfg. Co. (Formerly U. S. Pipe & Mfg. Co.), 250 East Grand Ave., South San Francisco, Calif., VALVES AND FITTINGS.

Tate Engineering & Supply Co., Inc., 516 South Eutaw St., Baltimore 1, Md., VALVES.

Harrison Steel Corp., 200 Greenpoint Ave., Brooklyn 22, N. Y., FLANGES AND FITTINGS.