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. 12 July 1955 No. 7

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.

The Merchant Marine Council of the United States Coast Guard

CONTENTS

DISTRIBUTION (SDL 61)

A: a aa b c d dd (2); remainder (1).
B: e (35); c (16); f (4); h (3); g (2); remainder (1).
C: a b c d e f g i m o (1).
D: i (5); a b c d e f g h j k l m (1).
List 141 M.
List 111.

FRONT COVER:

The SS *United States* and the SS *America* pass in majestic review in New York Harbor.

PHOTO CREDIT:

The map and photographs used on pages 111, 112, and 113 were furnished by Newport News Shipbuilding and Drydock Company—Photos by Nixon.

"The sea still is, and, for the farthest foreseeable future, will be the avenue for the movement of the vast majority of the things and stuff and men that must be shuttled around in the prosecution of a war, and for the feeding of insatiable war industries."

—Adm. Robert B. Carney, USN, Chief of Naval Operations

"Also hyre you a cage for half-a-dozen of hens or chickyns to have with you in the shippe or galley, you shall have nede of them a many time.

"In a shyppe choose you a chamber as nigh the middes of the ship as ye may. For there is least rolling or tumbling to kepe your brain or stomach in temper."

Quoted from Information of Pylgrymes unto the Holy Land, by Caxton in the 15th century.

"Effective seapower underlies the effective defense of the free world. First of all, seapower is vital to economic strength and health. Seapower in the hands of the West means that trade can flow and, we hope, will grow. Seapower also insures that the raw products of the free world can be exchanged across the seas, processed into the material needed, for further expansion and growth. The sealanes interconnecting us with the free world are indeed the lifelines of the free world."

—Secretary of the Navy Charles S. Thomas

FIRST LADY OF THE SEAS

Three years ago this July 14, 1955, the new superliner SS *United States* ended her record breaking voyage across the Atlantic and the Blue Ribbon Pennant was raised once again over an American ship.

Since that date this magnificent ship has proudly sailed the North Atlantic, adding lustre to the prestige of the U. S. Merchant Marine—a tribute to her builders, operators, officers, and crew, and the Country for which she was named.

On July 3, 1952, at 1200 hours, the *United States*, under command of Commodore Harry Manning, moved slowly away from pier 86 in New York. At 1336 hours she took departure off Ambrose Lightship and commenced what was to be her record-breaking voyage.

At 1200 hours the next day it was announced that the first day's run was 696 nautical miles at an average speed of 34.11 knots. An air of expectancy gripped the ship as the distinguished passengers and crew sensed that the Atlantic eastbound speed record would be broken.

The second day's run was 801 miles at 35.60 knots—the third day, 814 miles at 36.17 knots. At 0616 hours on July 7, 1952, Bishop Rock was abeam and a new eastbound record was set of 3 days, 10 hours, and 40 minutes. Miss Margaret Truman, one of the many distinguished guests, watched from the bridge beside Commodore Manning as the ship passed the record point.

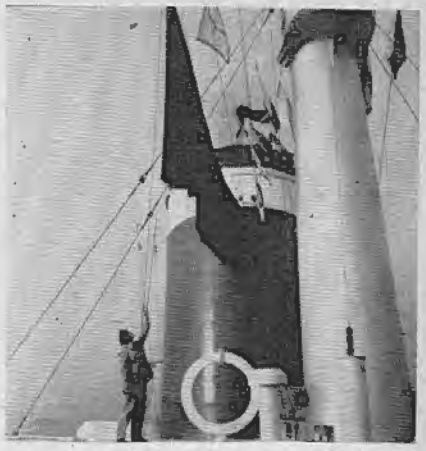
WELCOME

That afternoon the *United States* docked at La Havre amidst a tumultuous welcome. Hundreds of small launches and tugs accompanied her into the harbor. She remained there over night then proceeded across the channel to Southampton. There an even greater welcome met the ship. Numerous small excursion steamers loaded to the gunwales with waving passengers came out to meet her. Jet planes swept overhead and thousands of people lined the shores and the piers along the route to the dock. More than 5,000 people were on the dock to greet the ship as she came in.

RETURN VOYAGE

The *United States* left Southampton for her return voyage on July 10, 1952, via La Havre. She sailed from La Havre on July 11, 1952, and passed Bishop Rock at 0917 hours to start her bid for the westbound record.

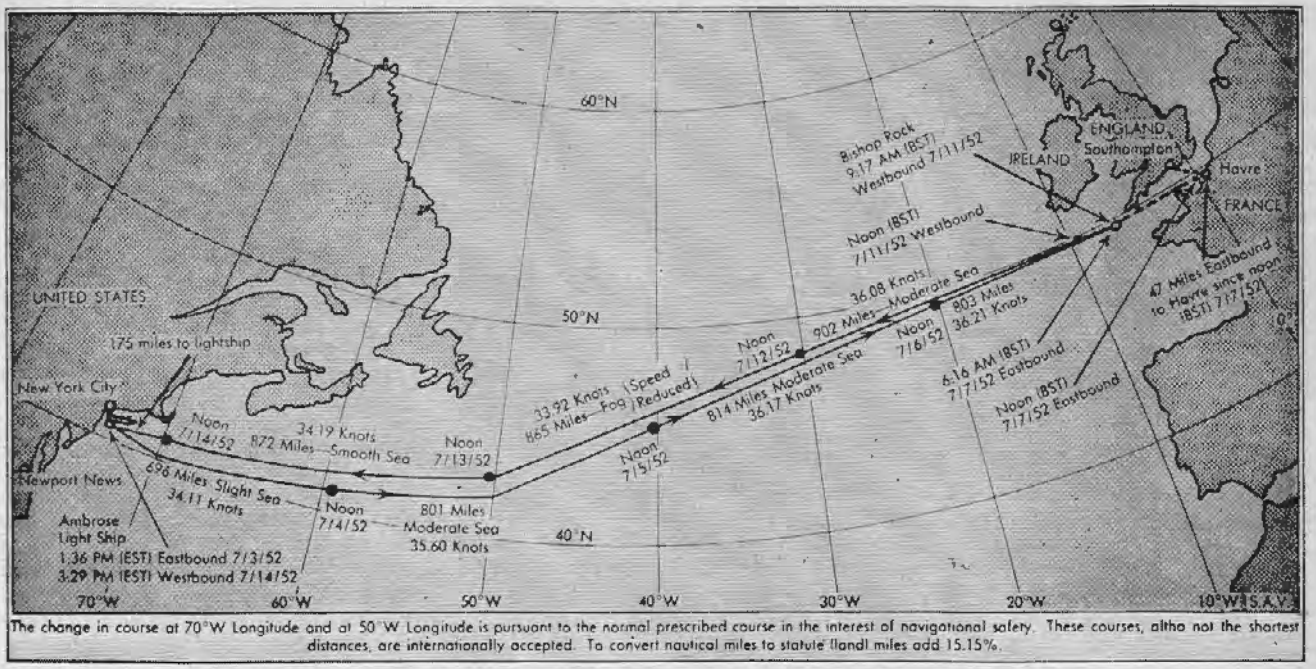
The first partial day's run was 341 miles at 34.10 knots—the next day's run was 902 miles at 36.8 knots, greater than that ever traveled by any previous ship. The third day out, fog was encountered and the Commodore



Raising the Blue Ribbon Pennant as the *United States* proceeded into New York Harbor on July 15, 1952. She docked at 9:00 a. m.

was forced to reduce speed; nevertheless, as she approached Ambrose Lightship, it was obvious that a new record had been established. At 1629 hours on July 14, 1952, the ship passed Ambrose Lightship and the new westbound record was set of 3 days, 12 hours and 12 minutes.

The maiden voyage of the SS *United States* was over but it would long be remembered in the annals of maritime history.



The change in course at 70°W Longitude and at 50°W Longitude is pursuant to the normal prescribed course in the interest of navigational safety. These courses, altho not the shortest distances, are internationally accepted. To convert nautical miles to statute (land) miles add 15.15%.

Map showing details of record-breaking voyage of SS *United States*.

347037—55

THE ATOMIC MARINER

President Eisenhower recently electrified the world when he announced that the United States will build the world's first atomic powered merchant vessel. He also requested that Congress appropriate $12,500,000 for the construction. Following this announcement, an Atomic Energy Commission spokesman stated that such a ship would be sailing the seas by 1957!

While the President did not say that plans had been underway for several years, it appears that such has been the case. Since as early as 1952, the Newport News Shipbuilding and Dry Dock Company, now famous for building the aircraft carrier USS *Forrestal*, has been actively engaged with the study of the application of atomic propulsion for surface vessels under an agreement with the Atomic Energy Commission.

Supplementing this study the company has constructed the first scale model to show the application of nuclear power for a cargo ship (*see fig. 1*). This model, built to a scale of ⅛ inch to each foot, is a miniature of the 560 foot, 20 knot Mariner class vessel. The main difference in the appearance of an atomic powered vessel would be the absence of a smoke-stack. Nuclear power would create no smoke or soot and would approach 100 percent in thermal efficiency.

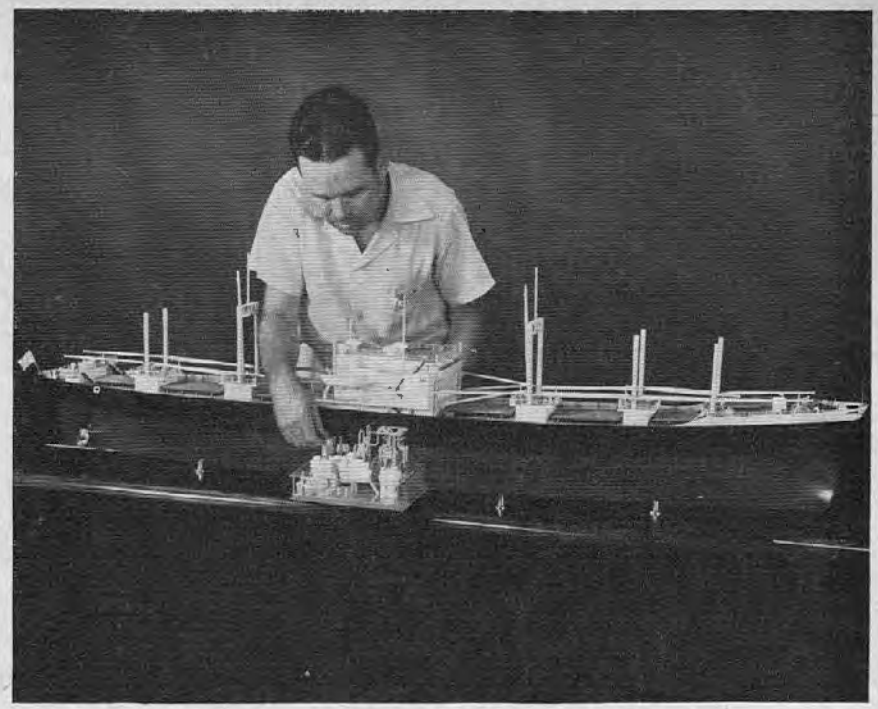
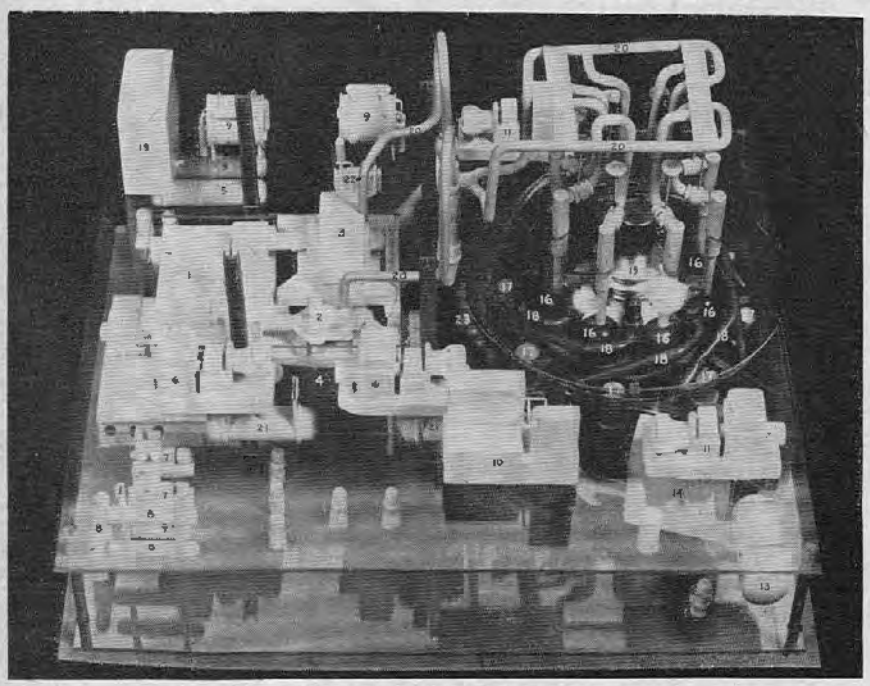


Figure 1. **A scale model of an Atomic Ship.**



MACHINERY IDENTIFICATION LIST

1. Main Reduction Gear. 2. High Pressure Turbine. 3. Low Pressure Turbine. 4. Main Condenser. 5. Main Lubricating Oil Cooler. 6. Ship's Service Turbo-Generator. 7. Refrigeration Compressor. 8. Refrigeration Condenser. 9. Distilling Plant. 10. Cargo Space Dehumidifying Unit. 11. Primary System Pump Turbo-Generator. 12. Main Throttle Valve. 13. Standby Condenser. 14. Primary System Storage Tank. 15. Reactor. 16. Steam Generator. 17. Primary System Pump. 18. Primary System Piping. 19. Lubricating Oil Storage Tank. 20. Main Steam Piping. 21. Turbo-Generator Condenser. 22. Main Air Ejector. 23. H. P. Air Storage Flasks.

EXISTING HULL

The first atomic vessel, the USS *Nautilus*, has already demonstrated that such propulsion is feasible, therefore, it is only a matter of time before atomic merchant ships will be a reality. Since Government officials have predicted that such a vessel will be operating as early as 1957, it is reasonable to assume that an atomic propulsion unit will be placed in an *existing* hull. Inasmuch as the Mariner-type ship was designed for commercial use and also to meet all requirements for a naval auxiliary, it appears to be the logical type of vessel to first become atomic powered.

Naturally, in discussing atomic propulsion, the fuel aspect is the first consideration. The fuel for such a vessel, instead of oil, would be fissionable isotopes of uranium. A cubic inch of this material would produce the energy of 1,300 tons of coal. In the conventional Mariner engineroom are two water-tube boilers, whose combined steaming weight is approximately 125 tons and which occupy approximately 20,000 cubic feet of space. In lieu thereof, would be installed an equivalent nuclear plant

consisting of a reactor which would generate heat and change water into steam. Machinery such as steam turbines, pumps, condensers, would be the equivalent of those on a normal ship. A proposed atomic engineroom is shown in *figure 2.*

SAFETY ASPECTS

Another aspect that has not been contemplated but that will be of great importance is the marine *safety* consideration. In this nuclear age the engineering department will be most affected as far as safety consideration—navigation and cargo handling will remain unchanged. As we will see, all phases of the safety aspect will in someway concern radiation.

The reactor which will be installed in the engineroom must be adequately shielded to protect personnel and cargo. This reactor will consist of a cylindrical core containing fuel, coolant, moderator (catalyst to slow fissioning of neutrons), reflector (to concentrate the neutrons) and the necessary structural container material. Available information has referred to shoreside reactor cores as being anywhere from 3 to 5 feet in diameter, so presumably the reactor itself will be some 8 to 10 feet in outside diameter.

The radiological shielding most commonly used with such reactors is a concrete shell approximately 6 feet thick faced with boron or steel. Obviously, such a shell sufficient in diameter to encompass the reactor would exert a greater stress on the tank tops than the 1,800 pounds per square inch for which the Mariner class is presently designed. This limitation would have to be remedied by design and structural reinforcement.

Assuming that the shielding is installed and is adequate, there will come the time when the reactor must be opened to replenish the isotopes and other fuel elements. Strict safety measures will have to be adopted during this operation to protect the crew from radiation.

In this operation the spent fuel elements will have to be placed in a lead container for removal from the ship. The magnitude of this operation can be appreciated when it is realized that this spent fuel may weigh as much as 10 tons. Released information on one of the reactors at Arco, Idaho, indicates that the core contains "more than 10 tons of enriched fuel." A lead container sufficient to handle this mass would probably weigh as much or more, meaning that a 25 ton mass of radiological waste would be handled in and removed from the engineroom. Such an operation would require continuous monitoring of engine and personnel spaces and possible evacuation for a period to insure safety of the crew.

Another interesting question that might arise is what would happen in the hypothetical situation where two atomic powered vessels collide. Would there be any possibility of an atomic explosion? Assume that such an explosion would not occur, but that one of the reactors was damaged and the core strewn about the engineroom. Would the entire ship then become radiologically "hot," endangering rescue operations and requiring that the ship be abandoned?

What would be the ramifications if two atomic ships collided in New York harbor and one of them sank? Would the water become contaminated from the submerged radioactive material?

This question of radiological "hot" waste material proposes many questions. While atomic powered engines in lieu of oil burning engines will decrease the possibility of oil pollution, will there now be the question of radiological pollution? Will there be a constant production of waste material while the reactor is in operation? If so, will it be safe to dispose of such waste at sea? Since disposal of radiological waste would not be permitted in inland waters, would such ships have to be equipped with auxiliary oil burning engines for propulsion for proceeding to and from sea and while alongside the dock?

These and many other questions on safety remain to be answered. Conceivably the day will soon be here when instead of a "fireman" on watch there will be a "fissionman," and one of the questions for a Chief Engineer's license will be "What is the maximum fission criticality possible with 10 isotopes of uranium?"

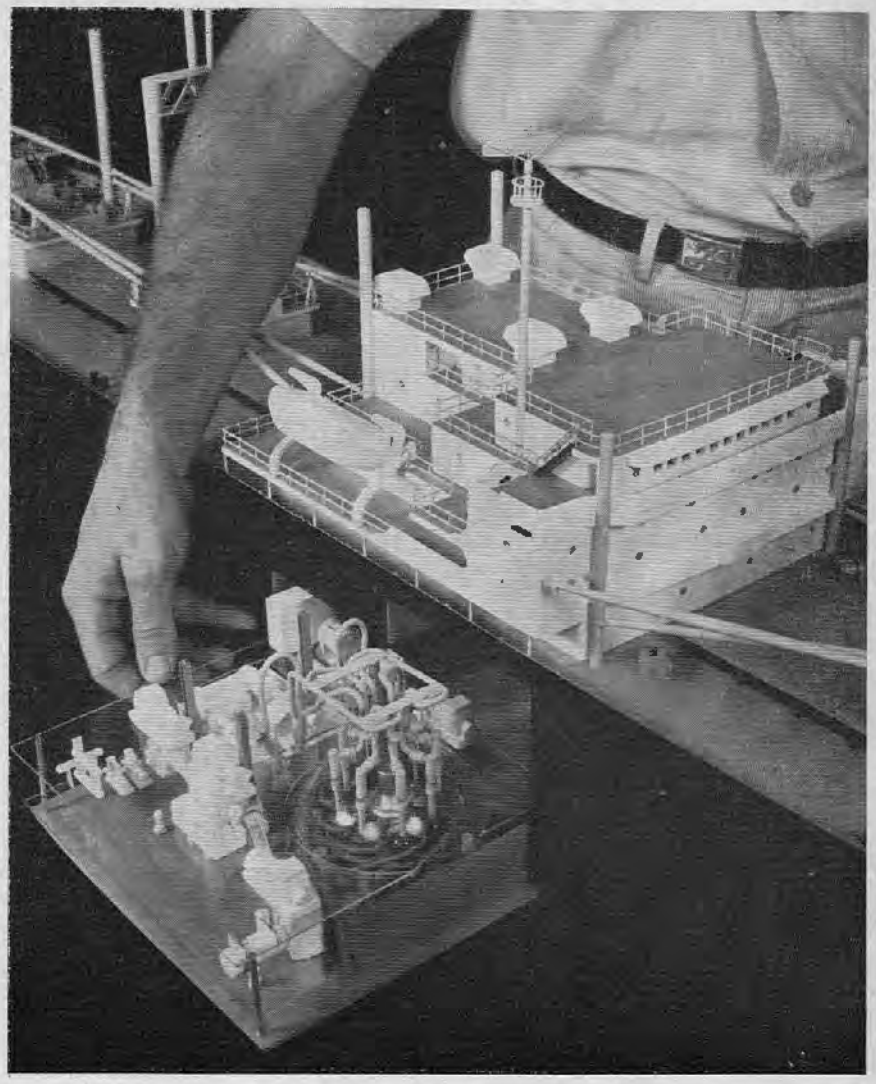


Figure 2. Close-up view of atomic machinery in the model.

SAFETY ON SUPER-SIZED TANKERS

By Charles L. Boyle, Manager, Marine Department, Sun Oil Company

Prevention of accidents has always impressed me as an elusive wraith, always completely unobtainable, but ever beckoning. In a sense we are idealists to seek so rare a goal, but in reality we are hard-headed materialists and altruists motivated by the desire to keep our co-workers healthy and sound and to avoid unnecessary and burdensome costs in the operation of our business.

The mechanics of accident prevention can be solved, but the vagaries of man test our patience and ingenuity. Rare is the man among us who at some time in his life did not have a close call with the scythe man through a momentary lapse of vigilance or a careless move. Personally I can reflect with chagrin, on the day I stepped through an open grating because my thoughts were engrossed with an engine inspection and someone rightly or wrongly interpreted Webster's definition for pitfall.

Our goal is most evasive when the accident-prone individual appears on the scene who, by design or nature, oblivious to our most sincere intentions for his personal welfare. If such a character is by nature a prospect for the injured list or the morgue, he should be shunted into safer pastures than the bounding main, but if on the other hand he finds it lucrative to feign or even suffer an innocuous injury, he should be resisted and fought on every turn.

REASONS FOR IMPROVEMENTS IN SAFETY

When the Company with which I am associated embarked on its program for fleet modernization, a capital opportunity presented itself to us in the Operations Department to review the omissions, defects, and accident sources of previous construction. Too often have we all heard the complaint that ship operators and seagoing personnel were not consulted sufficiently when a ship was in the stage of design or construction. This is a sad omission, because the men who operate and man the vessels are in a position to render valuable service to the naval architect and the shipbuilder.

With this in mind, we circulated a questionnaire among all our licensed personnel, with the basic theme—"If you were building a new ship, what would you recommend as desirable features or improvements?" The response was voluminous and meritorious. All the suggestions and recommendations were listed and reviewed by a group in the Operations Department, and the selected items were made a part of the specifications. The Operations Department, including the safety representative, reviewed all plans and specifications, and particular emphasis was given to elimination or ameliorating known sources or causes of accidents in previous ship design or fitting. We hope that the old saying, "Two minds are better than one," will justify itself in our accident experience with the new supertankers.

The dubious man may appropriately raise the question in view of the foregoing remarks—"Why the sudden devoted interest in safety features and why so late?" The answer is obvious to any operator reviewing his profit and loss sheet. Accident costs in the past ten years have developed into a serious cost factor in ship operations. Court awards and decisions on a ship owner's liability have stunned the operator into a more careful analysis of his responsibilities in the protection of his employees from accidents and constant education of the individual man in his part of promoting safety in the organization. The most deliberate planning in designing and equipping a safe ship is completely nullified by indifferent, careless or anti-safety personnel, so a safe place to work and live must be compounded with a sincere, never-ending educational program among all hands if a modicum of success is to be achieved.

If our reasoning be induced by past years' experience with accidents, then sober judgment should concern itself with the increased possibilities on the new supertankers. Designed as an answer to the highly increased costs of ocean transportation, they have incorporated higher speeds, deeper drafts and over double the carrying capacities of pre-war- or war-built tankers. The length, beam and drafts of these huge ships tax the accommodations of ports and channels, and in many places access is denied them because port facilities have lagged their development.

What has all this got to do with safety? Obviously, a ship navigating so close to the limits of channel depths, crowded by the width of the channel, seeking safe harbor in anchorage areas designed for vessels half their size, and required to maneuver to berths with turning basins that defy their size, all make for a high degree of skill and ingenuity to avoid grounds, collisions and miscellaneous property damage. Hand in hand with such exposures are the related threats to property and personnel from fire, pollution and the omnipresent dangers of explosions in collisions. Greater horsepowers occasioned by demand for higher speeds make mandatory the use of higher steam pressures and superheats in the ship's power plant. With full cognizance of the dangers that attend the use of these new power plants, designers must insure the proper support, expansion and protection from vibration of the boilers, steam lines, turbines and condensers, while operators and personnel must maintain a careful check for steam leaks that oftimes cannot be seen, loose connections, clean boilers and proper water treatment. Maintenance of good quality lubricating oil pressure, bearing temperatures and turbine operating clearances are just as much a part of safety on the ship as elimination of tripping hazards. Too often we think in terms of the common, everyday causes of accidents, and regard operational routines as being in a separate category. Nothing could be further from the true approach, when you consider the terrifying aspects of a turbine or generator explosion, a burned up boiler or a blown out gasket on a high pressure or high temperature steam line. Finding a badly wasted ring on the foremast ladder is picayune compared with an inspection that reveals a broken brace in a big steam line, or the sudden, rapid increase in a turbine bearing.

What has the relatively small increase of 1, 2, or 3 knots in speed got to do with increasing the safety hazard of the supertankers? Plenty. Consider first that the displacement tonnage of the vessel has been more than doubled; then add a few knots of speed to this doubled tonnage, then consider the inertia of this moving force in the light of an emergency—perhaps the imminence of a collision. The decision, based on a full knowledge of the vessel's backing power, rudder response and the rules of the road, must always remain alert to the unknown, the effects of the ship's inertia with a flood or ebb tide.

Officers first assigned to supertankers will, by instinct and past experience, base their decisions on the slower and smaller ships where they previously served. I had several occasions to witness the failure to give full consideration to this factor in

docking a supertanker. The ships on which I was a passenger stopped their engines about a mile from the docks, drifted up slowly to the dock area and in a reasonable distance below the dock applied astern power. In one case the ship continued to move past the dock, requiring the vessel to turn around and make the second approach. In another instance, when the ship apparently became dead in the water, it surged ahead when the astern power was removed. These events occurred despite the fact the ships in question were docking against an ebb tide of moderate strength. I merely give these to illustrate the importance of this factor if two supertankers were approaching each other in collision headings and the necessity for earlier decisions than is required on the slower and smaller ships. Before departing from the thought of collisions, consider the enormous forces opposing each other in the event of collision. A similarity might well be the head-on meeting of two heavy freight trains. Accordingly, a much higher degree of vigilance, alertness and sound judgment must be in evidence at all times with those entrusted the operation and navigation of these new ships. Time will develop the experience and wisdom in officers to properly evaluate these forces, but in the interim, let's counsel caution and awareness.

I have previously mentioned the inadequacy of port facilities and anchorages to accommodate these new ships. I have repeatedly seen some of these super-sized oil carriers anchored in the channel because the anchorage areas could not accommodate their draft or give them the proper room to swing with a change of tide. This is a very undesirable and unhealthy situation, openly extending an invitation to collisions. Fortunately, local harbor committees and the U. S. Army Engineers share the same sentiments, and positive action to correct this is either underway or in process of consideration.

We ran some anchoring tests with a fully loaded ship, primarily intended to test the holding power of a new design anchor, and the ability of the wildcat brake to take the load. I was much impressed by the necessity to have the ship practically dead in the water when the anchor was let go, otherwise the chain would either turn the wildcat or jump it if too much brake pressure was applied. When the anchor was raised after one of these tests, it brought up with it large white boulders, to give you some idea of how it had dug in. This feature has raised a serious question in my mind on the desirable depths at which pipelines and cables should be laid under the river bottoms near our ports. I can assure you that you're not surrounded by an aura of safety as you see that big chain flying out of the chain locker and jumping the wildcat when the strain endures. Again, caution to your speed and inertia and forget the anchor as an asset to avoiding a collision as of yore, because you need to be practically dead in the water when you drop it, so it won't be any help at that point.

Some of you no doubt are familiar with the refrain with the intriguing lines—"Up, up she rises, early in the morning." The phrase is appropriate to a supertanker, for she fairly rises up out of the water when discharging her cargo. The very high rates of discharge, up to 25,000 barrels per hour, can empty her holds in about 12 hours, and this taxes the attention of the crew in slacking lines and running down the tankers. They have more than enough to do without worrying about the gangway and its hazards. For this reason, a self-feathering tread aluminum gangway with platform, 45 feet in length, has proved to be the solution. Gangway accidents are usually very serious ones if not fatal, and the use of a ramp-type gangway when these ships are unloaded is a hazard to behold.

Now to get mercenary about the benefits of safety. First of all, a good safety record in personnel or ship casualties is part and parcel of a good operating record. Money invested in equipment, design and safety programs is bound to pay dividends in reduction of losses from accidents. Well trained personnel are too valuable an asset to afford loss of their services from accidents, even disregarding the costs resulting from an accident. Supertankers are only profitable or justified when utilized to the maximum of their ability, and when laid up out of service for a casualty, the costs soar and quickly dissipate the margin of efficiency over their predecessors. Casualty costs likewise are proportionately more expensive because we are dealing with heavier hull material and more expensive parts in every respect.

SAFETY IS BUILT INTO THE SHIP

Preparation for reviewing a set of specifications that have been drawn up by the shipbuilder for a new ship, begins with a review of past costly accidents that could have been avoided by better design, such as ladder locations, operating valve locations, machinery layout, etc. This list is supplemented by the suggestions and recommendations from the ship's licensed officers. Each department head in the shore staff prepares a report on his own department. Then a shore staff group meeting sits down to sift out the proposals which are impractical or unnecessary.

It would not be prudent to attempt to bore you with the details of such a review, but reference to some of the highlights and reasons for the changes may shed some light on why I consider the design stage the starting point for accident prevention. When you look at the arrangement for the fore and aft catwalk, the check list shows several serious accidents from this source: the lighting arrangement was poor—man walked through opening to a ladder and fell to the deck, handrail arrangement poor and a man slipped or lost his balance, hitting the deck below. Then you remember one of your good men lost an eye because the fire line valve under the catwalk was placed just right to catch him in the dark when he was moving around one night pumping out ballast. Then you solemnly feel the hard shiny surface of your head and wonder if there wouldn't have been more there to keep you warm except for those darned valves and pipe flanges. So you decide the flying bridge must be raised so that the lowest tier of pipes is at a minimum of 6′ 6″ at the valves and flanges and at the same time you make a mental note to remind personnel not to hire any man taller than 6′ 6″.

Those fixed messroom chairs look attractive, but you remember the backs must be naturally weak because you had to pay for a bad back once when a loser at poker pushed back too hard and hit the deck. Two months later you hear that the same guy had the identical experience with backs (chairs and human) and you conclude backs are a source of worry and benches have an alibi—you go for fixed, I mean fixed benches. And if a fellow isn't sitting down, he may be lying down and how can a fellow hurt himself in bed? Well the record shows one rolled out of bed, so you decide to lower the height of the bunk with a single row of drawers beneath instead of a double and this covers insurance when he sits on the side of the bunk.

Seriously, most changes had a basic safety reason behind them. We went all out for mechanical seals on the cargo pumps to eliminate packing gland leakage and they lived up to our expectations. Eliminate the pumproom gas hazard at the source—packing glands on pumps and valves—and if you're dealing with petrochemicals, it's doubly important. In the past year I have seen the ambulance make two useless trips to the

(Continued on page 124)

SIDE LIGHTS ON THE RULES

In this, the 20th, article in the *Side Lights on the Rules* series, we shall continue the comparison of the International Rules with the local rules applicable to Inland Waters, Western Rivers, and the Great Lakes by turning to Rule 25, International Rules, which modifies the basic Steering and Sailing Rules for vessels meeting, crossing, or overtaking each other.

Rule 25, International Rules, is a twofold rule.

Section (a) states:

Rule 25. (*a*) In a narrow channel every power-driven vessel when proceeding along the course of the channel shall, when it is safe and practicable, keep to that side of the fairway or mid-channel which lies on the starboard side of such vessel.

Section (b), on the other hand, states:

Rule 25. (*b*) Whenever a power-driven vessel is nearing a bend in a channel where a power-driven vessel approaching from the other direction cannot be seen, such vessel, when she shall have arrived within one-half mile of the bend, shall give a signal by one prolonged blast of her whistle, which signal shall be answered by a similar blast given by any approaching power-driven vessel that may be within hearing around the bend. Regardless of whether an approaching vessel on the farther side of the bend is heard, such bend shall be rounded with alertness and caution.

Art. 25, Inland Rules, and Sec. 80.10, Pilot Rules for Inland Waters, are similar to Section (a) of Rule 25, International Rules:

Art. 25. In narrow channels every steam vessel shall, when it is safe and practicable, keep to that side of the fairway or mid-channel which lies on the starboard side of such vessel.

80.10 Keeping to right in narrow channels.—In narrow channels every steam vessel shall, when it is safe and practicable, keep to that side of the fairway or mid-channel which lies on the starboard side of such vessel.

Parts of Art. 18 (Rule V), Inland Rules, and Sec. 80.5, Pilot Rules for Inland Waters, are also similar to Sec. (b) of Rule 25, International Rules:

Art. 18. Rule V. Whenever a steam vessel is nearing a short bend or curve in the channel, where, from the height of the banks or other cause, a steam vessel approaching from the opposite direction can not be seen for a distance of half a mile, such steam vessel, when she shall have arrived within half a mile of such curve or bend, shall give a signal by one long blast of the steam whistle, which signal shall be answered by a similar blast given by any approaching steam vessel that may be within hearing. Should such signal be so answered by a steam vessel upon the farther side of such bend, then the usual signals for meeting and passing shall immediately be given and answered; but, if the first alarm signal of such vessel be not answered, she is to consider the channel clear and govern herself accordingly.

When steam vessels are moved from their docks or berths, and other boats are liable to pass from any direction toward them, they shall give the same signal as in the case of vessels meeting at a bend, but immediately after clearing the berths so as to be fully in sight they shall be governed by the steering and sailing rules.

IT IS SUGGESTED THE READER REFER TO CG–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;" CG–172, "PILOT RULES FOR THE GREAT LAKES AND THEIR CONNECTING AND TRIBUTARY WATERS AND THE ST. MARYS RIVER;" AND CG–184, "PILOT RULES FOR THE WESTERN RIVERS AND THE RED RIVER OF THE NORTH;" WHICH CONTAIN THE LOCAL RULES TO PREVENT COLLISIONS BETWEEN VESSELS ON THE LOCAL WATERS OF THE UNITED STATES. REFERENCES TO RULES AND ARTICLES THROUGHOUT THIS SERIES MAY BE FOUND THEREIN.

It will be noted, however, that in Inland Waters the bend signal is also used by a vessel leaving her berth.

Further differences are to be found in the equivalent local rules for the Western Rivers and the Great Lakes.

There are no local Western Rivers Rules similar to Rule 25 (a), International Rules. In these waters, power-driven vessels descending a river are given the right-of-way over ascending power-driven vessels in Rule Numbered 18 (b), Western Rivers Rules:

Rule Numbered 18. (*b*) When an ascending steam vessel is approaching a descending steam vessel on a river, the signals for passing shall be one distinct blast of the whistle by each vessel if passing port to port, and two distinct blasts of the whistle if passing starboard to starboard.

The pilot of the ascending steam vessel shall give the first signal for passing, which shall promptly be answered by the same signal by the pilot of the descending steam vessel, if safe to do so, and both shall be governed accordingly; but if the pilot of the descending steam vessel deems it dangerous to take the side indicated by the ascending steam vessel, he shall immediately signify that fact by sounding four or more short and rapid blasts, the danger signal, and it shall be the duty of the pilot of the ascending steam vessel to answer by a similar danger signal and the engines of both shall immediately be stopped and backed, if necessary, until signals for passing are given, answered, and understood. After sounding the danger signal by both vessels, the pilot of the descending steam vessel shall indicate by his whistle the side on which he desires to pass, and the pilot of the ascending steam vessel shall govern himself accordingly, the descending steam vessel being entitled to the right-of-way.

The pilot of the descending steam vessel shall not blow the first signal, except that if the other vessel has not whistled when the steam vessels, or the forward end of their tows, if being pushed ahead, are within one-half mile of each other, he shall blow the first danger signal, which shall be promptly answered by a danger signal by the ascending vessel; but whether answered or not, the pilot of the descending vessel shall indicate the side on which he desires to pass, and both vessels shall be governed accordingly.

Similarly, power-driven vessel descending a river with a tow are given a right-of-way over power-driven vessels crossing the river in Rule Numbered 19 (a), Western Rivers Rules:

Rule Numbered 19. (*a*) . . . a steam vessel descending a river and towing another vessel or vessels shall be deemed to have the right-of-way over any steam vessel crossing the river, and shall give as a signal of her intention to hold on across the bow of the other vessel, three distinct blasts of the whistle. The crossing vessel shall immediately reply with a similar signal, and shall keep clear by stopping or going under the stern of the descending vessel.

The Pilot Rules for the Western Rivers, specifically Secs. 95.07, 95.11, 95.13, and 95.15, in turn, set forth specific procedures to be followed by power-driven vessels in close waters:

95.07 Vessels meeting at confluence of two rivers. When two steam vessels meet at the confluence of two rivers, the steam vessel which has the other to port shall give the first signal; but in no case shall pilots on steam vessels attempt to pass each other until there has been a thorough understanding as to the side each steam vessel shall take.

95.11 Narrow channels. When two steam vessels are about to enter a narrow channel at the same time, the ascending steam vessel shall be stopped below such channel until the descending steam vessel shall have passed through it; but should two steam vessels unavoidably meet in such narrow channel, then it shall be the duty of the pilot of the ascending steam vessel to make the proper signals, and when answered, the ascending steam vessel shall lie as close as possible to the side of the channel and either stop the engines or move them so as to give the boat only steerageway; and the pilot of the descending steam vessel shall cause his steam vessel to be worked slowly until he has passed the ascending steam vessel.

95.13 Approaching bridge span or draw. (a) When two steam vessels are approaching a bridge span or draw from opposite directions and the passing signals have been given and understood, should the pilot of the descending steam vessel deem it dangerous for the steam vessels to pass each other between the piers of such span or draw, he shall sound the alarm or danger signal and it shall then be the duty of the pilot of the ascending steam vessel to answer with a similar alarm signal, and to slow or stop his engines below such span or draw until the descending steam vessel shall have passed.

(b) If the ascending steam vessel is already in the bridge span or draw, and the descending steam vessel sounds the danger or alarm signal, it shall be the duty of the ascending steam vessel, if practicable, to drop below the bridge span or draw, and wait until the other steam vessel shall have passed.

95.15 Ascending, descending steam vessels crossing river. The pilot of an ascending steam vessel shall in no case attempt to cross the river when an ascending or descending steam vessel shall be so near that it would be possible for a collision to ensue therefrom; and conversely, the pilot of a descending steam vessel shall in no case attempt to cross the river when an ascending or descending steam vessel shall be so near that it would be possible for a collision to ensue therefrom.

The only similarity in provisions is to be found in Rule Numbered 24 (b), Western Rivers Rules, which is comparable to Rule 25 (b), International Rules:

Rule Numbered 24. (b) Whenever a steam vessel, whether ascending or descending, is nearing a bend in a channel where, from the height of the banks or other cause, a steam vessel approaching from the other direction cannot be seen for a distance of six hundred yards such steam vessel, when within six hundred yards of such bend—or if she have a tow projecting ahead, then when the head of such tow is within six hundred yards of the bend—shall give a signal by three distinct blasts of her whistle, which signal shall be answered by a similar signal given by any approaching steam vessel that may be within hearing around the bend. Should such signal be so answered by a steam vessel upon the farther side of such bend, then, immediately upon sighting each other, the usual signals for meeting and passing shall be given and answered. Regardless of whether an approaching vessel on the farther side of the bend is heard, such bend shall be rounded with alertness and caution.

As in Inland Waters, this signal is also used by a power-driven vessel leaving her berth:

Rule Numbered 24. (c) When a steam vessel is moved from her dock, or anchorage, she shall give the same signal as in the case of a steam vessel nearing a bend, but she and any approaching vessel shall be governed by rules 25 and 26 until her course is apparent, and then both vessels shall be governed by the other steering and sailing rules.

The local rules for the Great Lakes do not include provisions similar to Rule 25 (a), International Rules, either.

In these waters, descending power-driven vessels are given the right of way over ascending power-driven vessels in certain channels by Rule 24, Great Lakes Rules, and Sec. 90.5, Pilot Rules for the Great Lakes:

Rule 24. That in all narrow channels where there is a current, and in the rivers Saint Mary, Saint Clair, Detroit, Niagara, and Saint Lawrence, when two steamers are meeting, the descending steamer shall have the right of way, and shall, before the vessels shall have arrived within the distance of one-half mile of each other, give the signal necessary to indicate which side she elects to take.

90.5 Vessels approaching each other "head and head." . . . in all narrow channels where there is a current, and in the rivers St. Mary, St. Clair, Detroit, Niagara, and St. Lawrence, when two steam vessels are meeting, the descending steam vessel shall have the right of way and shall, before the vessels shall have arrived within the distance of half a mile of each other, give the signal necessary to indicate which side she elects to take.

In addition, power-driven vessels in channels less than 500 feet in width are required to slow down to moderate speed when meeting, and if running in the same direction, not to pass without prior agreement, by Rule 25, Great Lakes Rules:

Rule 25. In all channels less than five hundred feet in width, no steam vessel shall pass another going in the same direction unless the steam vessel ahead be disabled or signify her willingness that the steam vessel astern shall pass, when the steam vessel astern may pass, subject, however, to the other rules applicable to such a situation. And when steam vessels proceeding in opposite directions are about to meet in such channels, both such vessels shall be slowed down to a moderate speed, according to the circumstances.

Here too, the only similarity in provisions is with respect to the bend signal prescribed in Rule 25 (b), International Rules.

The bend signal is prescribed in Sec. 90.6, Pilot Rules for the Great Lakes, in these terms:

90.6 Vessels nearing short bend or curve in channel. Whenever a steam vessel is nearing a short bend or curve in the channel, where, from the height of the banks or other cause, a steam vessel approaching from the opposite direction cannot be seen for a distance of half a mile, the pilot of such steam vessel, when he shall have arrived within half a mile of such curve or bend, shall give a signal by one blast of the whistle, of at least 8 seconds' duration, which signal shall be answered by a similar blast, given by the pilot of any steam vessel within hearing that may be approaching on the other side, and within half a mile, of such bend or curve. Should such signal be so answered by a steam vessel upon the farther side of such bend, then the usual signals for meeting and passing shall immediately be given and answered.

As in Inland Waters and the Western Rivers, this signal is also given by a power-driven vessel leaving her berth. The usage of the bend signal for this purpose is set forth in Sec. 90.7, Pilot Rules for the Great Lakes:

90.7 Vessel leaving a dock. When a steam vessel is leaving her dock or berth, she shall give a signal of one blast of the whistle, of at least 8 seconds' duration, which signal shall be answered by a similar blast given by any approaching steam vessel, but she and any approaching vessel shall be governed by Rule 27, the general prudential rule, until her course is apparent, and then both vessels shall be governed by the applicable steering and sailing rules.

This does not conclude the differences between Rule 25, International Rules, and the local rules applicable to the Great Lakes, Western Rivers, and Inland Waters.

The local rules for the latter waters have a common difference in provisions for vessels approaching a floating plant at work in a navigable channel.

Under Secs. 80.26 and 80.27, Pilot Rules for Inland Waters, and Secs. 201.10 and 201.11, Corps of Engineers Regulations for the Western Rivers and the Great Lakes, power-driven vessels approaching a floating plant are required to follow the procedure set forth below:

80.26 (201.10) Passing signals. (a) Vessels intending to pass dredges or other types of floating plant working in navigable channels, when within a reasonable distance therefrom and not in any case over a mile, shall indicate such intention by one long blast of the whistle, and shall be directed to the proper side for passage by the sounding, by the dredge or other

floating plant, of the signal prescribed in the local pilot rules for vessels under way and approaching each other from opposite directions, which shall be answered in the usual manner by the approaching vessel. If the channel is not clear, the floating plant shall sound the alarm or danger signal and the approaching vessel shall slow down or stop and await further signal from the plant.

(b) When the pipe line from a dredge crosses the channel in such a way that an approaching vessel cannot pass safely around the pipe line or dredge, there shall be sounded immediately from the dredge the alarm or danger signal and the approaching vessel shall slow down or stop and await further signal from the dredge. The pipe line shall then be opened and the channel cleared as soon as practicable; when the channel is clear for passage the dredge shall so indicate by sounding the usual passing signal as prescribed in paragraph (a) of this section. The approaching vessel shall answer with a correspounding signal and pass promptly.

(c) When any pipe line or swinging dredge shall have given an approaching vessel or tow the signal that the channel is clear, the dredge shall straighten out within the cut for the passage of the vessel or tow.

NOTE: The term "floating plant" as used in §§ 80.26 (201.10) to 80.31a (201.16), inclusive, includes dredges, derrick boats, snag boats, drill boats, pile drivers, maneuver boats, hydraulic graders, survey boats, working barges, and mat sinking plant.

80.27 (201.11) Speed of vessels passing floating plant working in channels. Vessels, with or without tows, passing floating plant working in channels, shall reduce their speed sufficiently to insure the safety of both the plant and themselves, and when passing within 200 feet of the plant their speed shall not exceed five miles per hour. While passing over lines of the plant, propelling machinery shall be stopped.

It is deplorable that such differences can be noted between the respective rules to prevent collisions. Some of the differences are necessary for special local conditions. However, it would seem that a greater similarity could be possible, if not complete uniformity.

In the next article in this series, other needless differences will be noted when the comparison turns to Rule 26, International Rules.

HIGHLIGHTS ON THE RULES

Once again a United States district court has commented on the proper use of radar in fog. In this case a cargo vessel struck a trawler at night in circumstances in which patches of fog were experienced. The court found that there was no plausible explanation for failure to exercise the proper degree of caution, except the pilot's statement that considerable reliance was placed on the radar—that if radar had not been in operation speed would have been reduced. The other vessel was sighted on the radar screen 3 miles off, but the court said that in the rapidly deteriorating weather a speed of 15 knots was not warranted simply because radar was in operation. Radar, it was held, was an aid to, not a substitute for, prudent seamanship, and the vessel was at fault in violating Article 16 of the International Rules.

SPECIAL CITATION

The Standard Oil Company of California recently received a special citation from the Public Health Service, U. S. Department of Health, Education, and Welfare, for having achieved a PHS Certificate of Sanitation on every tankship in its fleet. The presentation was made following a luncheon served aboard the SS *J. H. Tuttle*, at Richmond, Calif. A specially designed, framed, parchment scroll was presented to Mr. A. E. Kihn, Manager of Standard's Marine Department, by Mr. Malcolm C. Hope, representing the Surgeon General of the Public Health Service.

Mr. T. S. Petersen, president of the company, in response to the Surgeon General's announcement, said: "It is certainly an honor for Standard Oil Company of California to receive from the Public Health Service an award of merit for being the first to have its entire tanker fleet certificated for high sanitary standards. Credit for winning this award of merit belongs to the men of the fleet, for it is they who have achieved this recognition."

Under the provisions of the Foreign Quarantine Regulations and Interstate Quarantine Regulations, the Public Health Service guards against the admission of communicable diseases into the United States and their spread across State lines. The General Engineering Program of the PHS, Division of Sanitary Engineering Services inspects all conveyances in interstate commerce and all American flag vessels to encourage maintenance of sanitary standards. Although PHS has enforcement authority under the Regulations, its program historically has been based on cooperation with the carriers, and its vessel-inspection work has received excellent support from the shipping industry.

The periodic inspections conducted by vessel inspectors of the Interstate Carrier Section of the General Engineering Program embrace such major sanitation features as potable water, washwater, swimming pools, waste disposal, vermin control and food sanitation, including 167 separate items involving both basic construction and sanitary maintenance.

Since 1951 the Public Health Service has been awarding a Certificate of Sanitation to every vessel which scores a rating of 95 or over on such an inspection. This has resulted in such manifest sanitary improvement in the American Merchant Marine fleet that the Service has undertaken to award, to any major vessel operating company which earns a Certificate of Sanitation on every vessel in its fleet, a special citation. Standard of California is the first coastal vessel-operating company to receive such a citation.

Its fleet includes 15 seagoing tankships with a deadweight capacity of 200,000 tons and a volumetric capacity for petroleum in bulk of 1,600,000 barrels.

WHEN IS A SHIP BORN?

"A ship is born when she is launched, and lives so long as her identity is preserved. Prior to her launching she is a mere congeries of wood and iron—an ordinary piece of personal property—as distinctly a land structure as a house, and subject only to mechanics' liens created by a State law and enforceable in the State courts. In the baptism of launching she receives her name, and from the moment her keel touches the water she is transformed, and becomes a subject of admiralty jurisdiction. She acquires a personality of her own; becomes competent to contract, and is individually liable for her obligations upon which she may sue in the name of her owner, and be sued in her own name. Her owner's agents may not be her agents, and her agents may not be her owner's agents. She is capable, too, of committing a tort, and is responsible for damages therefor. She may also become a quasi-bankrupt; may be sold for the payment of her debts, and thereby receive a complete discharge from all prior liens, with liberty to begin a new life, contract further obligations, and perhaps be subjected to a second sale."—Tucker vs. Alexandroff, 183 U. S.

⚓ 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. One of the names which has a distinguished place on this roll is that of Alan L. Harvie, who is presently serving on the SS *Hawaiian Planter* as First Assistant Engineer.

In July 1942, while he was serving aboard the SS *Honomu*, the vessel was torpedoed and sunk. After 13 days on a liferaft, he was rescued. Before returning home in the United States, Harvie survived a second torpedoing and sinking.

For his conduct during the sinking of the *Honomu*, Mr. Harvie received an official letter of commendation from the War Shipping Administration and became the first merchant mariner to receive a high British award for heroism.

On August 25, 1944, the letter of commendation and the British Distinguished Service Cross were presented to Mr. Harvie by the British Consul General in San Francisco.

The citation reads:

> In July 1942, the SS *Honomu*, in which Second Assistant Engineer Harvie was serving, was torpedoed by a German submarine and sank ten minutes later. Harvie was on watch in the engineroom when the torpedo struck. The engineroom was filled with flying debris and flooded with water pouring down ventilator shafts. The oiler and fireman on watch immediately rushed on deck leaving Harvie to cope with the situation unassisted. Realizing the impending danger of fires and explosions, he nevertheless fought his way through the debris and succeeded in shutting down the main engines, putting out fires in the boilers, and securing the entire ship's plant. This action was performed under very hazardous conditions. His courage, skill, and utter disregard of personal danger enabled his shipmates to abandon ship in safety and will be a lasting inspiration to all seamen of the United States Merchant Marine. ⚓

nautical queries

Q. What is a Bill of Health and who issues it?

A. A Bill of Health is a paper certifying the conditions of health of all on board and health conditions in the port of departure in regard to contagious diseases. The Public Health officials issue it in the United States and it is endorsed by the consul of the country of destination. In foreign ports, the bill of health is issued by the U. S. Consul.

Q. What requirements must be met to bring the body of a person dead from a communicable disease into the United States?

A. The remains of a person dead from a quarantinable disease shall not be brought into a port under the control of the United States unless it is:

(a) properly embalmed and placed in a hermetically sealed casket or:

(b) cremated.

Q. Describe the responsibility of the master with respect to narcotic drugs placed on a vessel for medicinal purposes.

A. The master of a vessel is trustee with respect to the narcotic drugs aboard the vessel, and is charged with the over-all responsibility of safeguarding the requisition, purchase, receipt, storage, issue, use and record keeping of narcotics. No one but the ship's surgeon or the master may sign a Purchase Order for Narcotic Drugs Supplied to Vessels, but other details concerned with the responsibility of safeguarding narcotics may be delegated, subject to the master's primary responsibility, to the senior medical employee aboard (physician, purser-pharmacist's mate, hospital corpsman, or registered nurse). If no medical personnel is included in the complement the master should retain full responsibility for the safeguarding of narcotics.

Q. What should be done with any member of the crew who is sick with a communicable disease?

A. He should be isolated and one member of the crew detailed to take care of him. If practical this crew member should be immune to the disease. There should be as little communication with the patient and his nurse as is possible. Clothing, body linen and bedding of the patient should be immersed in boiling water or a disinfecting solution of bichloride of mercury or carbolic acid solution.

Q. What measures should be taken after washing dishes and eating utensils to ensure that they are in a sanitary condition?

A. After a thorough washing, eating and drinking utensils should be subjected to an effective bactericidal treatment, by one or more of the following methods:

(a) By immersing the utensil or equipment for at least 2 minutes in clean hot water at a temperature of at least 170° F., or for one-half minute in boiling water (212° F.).

(b) By immersing utensils or equipment for at least 2 minutes in a lukewarm chlorine bath containing at least 50 p. p. m. of available chlorine.

Note: p. p. m.=parts per million.

Q. What sanitary precautions are advisable with respect to garbage and garbage containers?

A. Prior to its removal from the vessel, all garbage should be received and stored in watertight, nonabsorbent, easily cleaned containers, both in the food-handling spaces and on the open deck. To prevent nuisance conditions, garbage containers should be thoroughly washed when emptied, and, if necessary, treated with a disinfectant. They should be provided with close fitting lids and should be uncovered only when the containers are in use in galleys and pantries during the preparation of meals.

Q. If a tap from the sanitary system is installed in the galley, where should it be placed and how marked to distinguish it from the drinking water taps?

A. This tap should not be over 18 inches from the floor, should be painted red and should be posted with a sign warning against the use of this water for drinking or cooking.

Q. What precautions must be observed in obtaining drinking water in port?

A. Water for drinking and cooking must be obtained from a supply of known purity. Definite knowledge must be had that the water is wholly safe before it is put in the vessel's tanks. To secure this the health officer of the port should be consulted. In American ports, water should not be purchased from any water boat which does not hold an unrepealed certificate from the U. S. Public Health Service. Fire hose should not be used to fill tanks. For this purpose it is best to have a special hose which is used for no other purpose.

LESSONS FROM CASUALTIES

DEATH AT 335° F.

As the foreign freighter slowly warped into the pier at one of our southern ports, with two small steam tugs chuffing and churning alongside, all seemed calm. There was no premonition of disaster. The skipper of the smaller tug glanced at his pilothouse clock and boiler steam gauge. They read 10:43 p. m. and 95 p. s. i.—boiler pressure a little low, but within normal operating limits. Suddenly there was a tremendous roar and a gush of hot water and steam from the little tug's boiler-engineroom! As the small vessel trembled and was plunged into darkness, the Master and deckhand rushed back to the engineroom door in time to help the Chief Engineer crawl out on deck. Writhing and moaning in great pain, he could only lie on deck and beg for help. He had suffered the terrible ordeal of second and third degree burns over 90 percent of his body which meant that he was doomed. Below in the hot steam-clouded boiler space, the fireman lay, beyond all help. He had died almost instantly. A calamity which once, all too frequently, struck terror into the hearts of passengers and crews on early steamboats and which had almost disappeared from the American scene, struck once again—a Scotch boiler had exploded!

This 98 ton tug, built in 1882, had been reboilered in 1923 with a Scotch Boiler built by Kingsford Foundry and Machinery Works, Oswego, N. Y., with two Morison Corrugated Furnaces. The length of the boiler was 11′ 3″, diameter 109″, thickness of shell $\frac{7}{16}$″, tensile strength of shell 60,000 pounds. The boiler had a common combustion chamber and was fired with oil. The allowed boiler working pressure was 150 p. s. i. The last annual inspection had taken place ten months before the date of the casualty. At that time a hydrostatic pressure of 225 p. s. i. had been applied to the boiler.

UNAUTHORIZED WELDING

The horse collars of both port and starboard furnaces were found to have welding on the knuckles extending nearly around the entire circumference. However, the records in the Marine Inspection Office at the inspection port indicated that only the port furnace had been welded. The records showed a total welded length of 11″, which was less than one-tenth of the actual distance welded. It developed that on two occasions, following the last annual inspection, the furnace horse collars had been welded by an *unqualified and unauthorized* welder without the knowledge or permission of the local Officer-in-Charge of Marine Inspection.

The Chief Engineer who died as a result of the explosion knew that this unqualified welder was not supposed to weld on pressure vessels subject to inspection but, nevertheless, instructed him to perform the work.

CAUSE OF EXPLOSION

An investigation of the casualty indicated that the failure of the boiler had been caused by a gradual collapse of the port furnace and the progressive flattening and fall of the furnace crowns over a long period of time. When the critical moment arrived, as the tug was steaming full ahead that disastrous night, a total collapse of the port furnace (*see figure 1*) occurred and the tension exerted on the horse collars by the collapsing furnace caused two large fractures. Hot water escaping through these fractures flashed into steam upon being released to atmospheric pressure and upon striking the hot surface of the fireside, and generated sufficient pressure in the furnaces to cause a violent explosion. This explosion blew the furnace front assembly off with terrific force toward the after end of the boiler room. The flying parts struck the fireman, driving him back into the moving engine and pinning him against the high pressure eccentrics. His left arm was sheared off and he was killed immediately. The Chief Engineer, who had been sitting on a settee in the engineroom, was blown off the settee and engulfed in clouds of live steam and scalding water, but managed to climb out the starboard engineroom door. It was impossible for anyone else to enter the engineroom for 15 minutes due to the concentration of live steam.

Shortly after the explosion, the other tug came alongside the crippled vessel, and assisted her to the dock. An ambulance rushed the Chief Engineer to the hospital, but his case was hopeless, and he died two days later.

It was found that the port corrugated furnace had collapsed so completely that the crowns were crushed down till they contacted the bottom of the furnace. Both port and starboard furnace crowns were free of scale, oil, or grease on the waterside and the furnace metal showed no indication of overheating. Neither furnace had extensive pitting or corrosion along the fireline. The metal appeared to be good in all furnace corrugations but very poor in the horse collar knuckles, along the circumferential welded area. Fusible plugs were in good condition and the crown sheet did not indicate overheating. All boiler through stays and staybolts were tested and found in good condition. Although the boiler safety valve seal was found broken, the valve was tested after the casualty and functioned satisfactorily at 152 p. s. i. It was also found that the starboard furnace was down on all corrugations and in a dangerous condition, since a pronounced flat area existed along all crowns with the exception of #1 and #2 corrugations. The maximum distance of drop by tramming was $4\frac{11}{16}$″. The location of the flat area along the crown of the starboard furnace was identical with the angle and direction of collapse of the port furnace. The waterside of the port furnace horse collar was found to have a heavy grooving crack running circumferentially around the entire furnace as far as could be seen.

DEFECTIVE WELDS

Samples of corrugated sections were submitted to the National Bureau of Standards. The report of that agency, as a result of their examination and testing, indicated that the failure occurred in an area where there were a number of overlapping welds at the crown of a corrugation, indicating that repairs had been made at this location on several separate occasions. A number of cracks, some of which had penetrated nearly half of the plate thickness, were found in unwelded areas of the plate. The welds had been made from one side only, and full penetration of the weld metal, with complete fusion at the root of the weld, had not been obtained, probably because the cracks were not vee'd out properly before welding. Consequently, there were numerous fissures remaining on the far side of the welds, and new cracks propagated from these fissures as a result of stress concentration, probably combined with the concentration of corrosive products in these fissures. The fracture occurred at one of these fissures, and examination of the fracture edge showed that the newly fractured metal was only about one-fourth of the total thickness; the remainder of the fracture appeared to be old. Microscopic examination of

the weld metal indicated that at least some of the welds were made with bare wire electrodes. Such welds are generally low in ductility. The chemical composition of the plate was typical of a low tensile strength carbon steel. The deposited weld metal was somewhat lower in carbon content, and the silicon content was considerably higher than that of the plate metal.

The Marine Board of Investigation on this casualty concluded that the fractures in the horse collar of the port furnace would not have developed had it not been for the extreme tensions exerted by the collapsing furnace, and that it was doubtful that the fractures would have occurred had the metal been in good condition. The Board also concluded that the serious grooving action in both the port and starboard furnace horse collar knuckles could not be readily seen on the water side of the furnace, due to the construction of the boiler. However, since the questionable welding extended around nearly the entire circumference of the horse collar on the water side of both furnaces, greater diligence by the inspectors and the Chief Engineer would have led to questioning the safety of a furnace with such a large area of welding, even though no leaks had developed under hydrostatic pressure at the last annual inspection of the boiler. The Board concluded that a competent Chief Engineer would have made periodic examination of the boiler between inspections and would have seen the dangerous flattening and dropping of the furnace crowns and prevented the total collapse of the port furnace.

The Board concluded that the owners and operators of this tug had violated the Marine Engineering Regulations, Title 46 CFR, Section 58.10–1, on at least two occasions by allowing an unqualified welder to weld cracks in the horse collar of the furnace of the boiler on the above tug, and that the owners and operators had also violated the Marine Engineering Regulations, Title 46 CFR, Section 58.01–5, on at least two occasions, having failed to notify the local Officer-In-Charge of Marine Inspection before welding repairs were made on the boiler of the above tug.

As a result, the company which owned and operated this tug was assessed the civil penalty of $500 for each of the above four violations, totaling $2000, as authorized by the provisions of R. S. 4499, as amended (46 U. S. C. 497).

Figure 1. **Port furnace after collapse, looking through firedoor.**

RECOMMENDATION

In addition, the Board recommended that, since the evidence clearly indicated that illegal and improper welding was done on the port furnace horse collar of this vessel and that failure of such welding caused by the collapse of the port furnace resulted in the death of two persons, the case be referred to the Department of Justice for criminal prosecution of the owners and operators, under the provisions of 18 U. S. C. 1115. This statute reads, in part: "When the owner or charterer of any steamboat or vessel is a corporation, any executive officer of such corporation, for the time being actually charged with the control and management of the operation, equipment, or navigation of such steamboat or vessel, who has knowingly and willfully caused or allowed * * * fraud, neglect, connivance, misconduct, or violation of law, by which the life of any person is destroyed, shall be fined not more than $10,000 or imprisoned not more than ten years, or both." However, such referral to the Department of Justice was not made since it was not determined which person had, at the time of the casualty, been actually charged with the control and management of the equipment of the tug. Furthermore, since it was possible that the horse collar, even if constructed of approved metal and repaired by approved welding may have fractured as a result of the furnace collapsing, there was considerable doubt that the failure of the Chief Engineer or other company personnel to have the welding performed by a qualified welder or to have the repairs approved by the Officer-In-Charge, Marine Inspection, could be construed as a criminal act.

The above casualty points out vividly the drastic effects possible when a Scotch boiler fails in service due to the neglect of sound engineering principles and practices, and the failure to comply with the rigid requirements of Federal regulations for proper and supervised repairs. An important consideration is the responsibility of the operating company to comply with these regulations and the law—a responsibility fully as great as that of the operating personnel attached to the vessel. While there are now only a few hundred Scotch boilers remaining in service aboard vessels in this country (principally on harbor tugs, Great Lakes vessels, and a few river steamers), the same principles of supervised repair by permission of and under the cognizance of the local inspectors,

apply equally to water-tube boilers and other pressure vessels and related piping and appurtenances. The Chief Engineer and fireman who were lost in the above steam tug casualty paid a heavy price for the failure of the vessel personnel, in this instance, to require and obtain proper and approved repairs to their boiler. The price paid by the operating company for its failures in these respects was relatively lighter, but could have been long imprisonment or an extremely heavy fine, or both.

⚓ ⚓ ⚓

PASSING ACQUAINTANCE

It has often been said that the driver of an automobile must be concerned not only with his own operation, but even more with what "the other fellow" is going to do. The master of a large freighter, entering a United States port a few months ago, should have been a little more concerned with what "the other fellow" was doing. In broad daylight and perfect visibility, for no apparent reason, "the other fellow" passing on an opposite heading in a clear wide channel, suddenly sheered left, headed directly at the freighter and the two ships collided, doing about $120,000 worth of damage as each scraped and ground down the side of the other.

The inbound freighter had made a normal approach to the harbor channel, and was proceeding at about 5 knots. As she rounded one of the channel turn buoys and steadied on a new course, an outward-bound Liberty-type foreign freighter was sighted about 1,500 yards ahead, a little on the port bow, making about 8 knots. The channel at this point was over a mile wide, clear and unobstructed by traffic, although several ships were anchored on one side. Had both vessels continued their course and speed, they would have passed, port to port, about 150 yards apart.

The attention of the master of the inbound freighter, who was conning his ship, was diverted slightly by the vessels ahead and to the right which were anchored or preparing to leave the anchorage, since he anticipated such a movement might require an alteration of course and speed by him. At a point when the two approaching vessels were about 700 yards apart, the outbound Liberty began a slow sheer to port. This swing was immediately detected by the master of the inbound ship who later described it as what he thought to be "a normal yaw in the helmsman's steering." However, after 5 or 10 seconds, with the sheer continuing, the decision was immediately made that the Liberty's swing was out of the ordinary and the inbound freighter sounded the danger signal. This signal was repeated within a few seconds and then the engines were thrown full astern, 3 short blasts sounded on the whistle, and the general alarm was rung.

On board the outbound Liberty the trip down the channel had proceeded uneventfully until the aforementioned moment when the two vessels were about 700 yards apart. As the Liberty yawed to port, her pilot immediately ordered "right rudder." There was no noticeable effect. Glancing at the wheel, the pilot saw the helmsman and master heaving strenuously on the wheel attempting to swing it right, but without results. He also noticed that the pressure gauge on the left hand telemotor transmission line indicated a pressure of almost 1,000 p. s. i. and the right hand gauge indicated a pressure of about 600 p. s. i., although the normal operating pressure was from 300 to 400 p. s. i. Seeing that collision with the inbound ship was imminent, the pilot ordered the danger signal blown, emergency astern on the engine and the anchor dropped. By this time it was too late for the man on the bow to drop an anchor and was obviously dangerous for any man to remain on the bow.

When the two "in extremis" ships were about 65 yards apart at an angle of approximately 45°, the master of the inbound freighter shifted his engines to full ahead with hard left rudder, in an attempt to decrease the angle of collision and minimize the damage. The port bow of the Liberty ground into the port side of the inbound vessel, at an angle of about 30°, and raked her hull for a distance of about 200 feet before the two ships separated. Damage to the inbound ship, mostly above the waterline, was estimated at over $80,000. The port bow of the Liberty was holed and shattered above the waterline (*see figure* 2) to the amount of an estimated $40,000.

Following the collision, both vessels were able to proceed independently and safely to nearby berths. The steering apparatus on the Liberty functioned normally on her way back to the dock. A thorough investigation of the steering gear and transmission apparatus on the Liberty failed to disclose any obvious cause for the temporary failure which led to the casualty. The best conclusion that could be made was that a small amount of foreign material had momentarily lodged in a valve at some point in the telemotor hydraulic system, rendering the system temporarily inoperative. A sudden rise of hydraulic pressure on the port transmission line of the telemotor system to about 1,000 p. s. i. in the vicinity of the gauge takeoff, or approximately 3 times the normal operating pres-

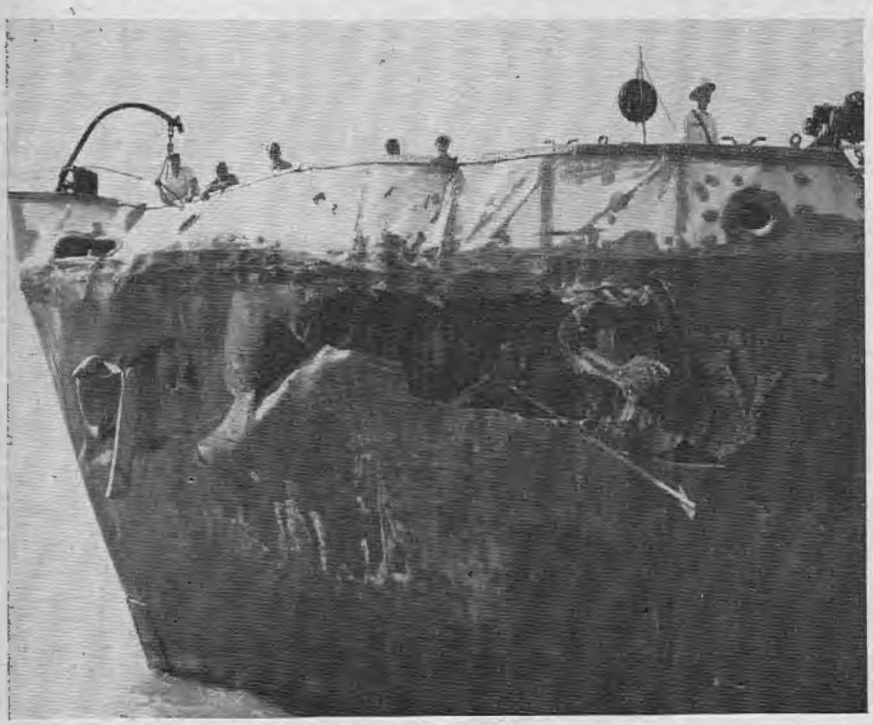


Figure 2. **One of two vessels that met not quite head on.**

sure, at a moment when two men were trying desperately to turn the wheel right would indicate a positive stoppage in the hydraulic line between the port transmitter piston and the telemotor receiver aft at the steering engine. With a heavy strain on the wheel to go right or to starboard, the starboard transmitter piston was setting up an unusually high of 600 p. s. i. pressure in the starboard line to the telemotor receiver. However, the receiver was blocked from movement by the stoppage and the 1,000 p. s. i. in the port line and could not relieve the 600 p. s. i. side of the line by moving and turning the steering gear.

Apparently the relief valves on both sides of the transmitter were frozen, or were set to relieve at over 1,000 p. s. i., otherwise the excess pressure would have opened these valves and the hydraulic fluid would have flowed through the bypass line equalizing the pressure on both sides of the transmitter. In addition to the 600 p. s. i. set up in the starboard line by the efforts of the men to apply right rudder, the heavy centering spring on the telemotor receiver was also exerting additional pressure to bring the rudder right, or back to amidships. This additional force acting against the pressure in the port line was sufficient to raise the port line pressure up to near 1,000 p. s. i.

Whatever was momentarily blocking the port telemotor line was evidently dislodged by the shock of collision or by the gyrations of the wheel immediately after collision, for the gear functioned normally thereafter. The presence of foreign matter in the hydraulic system could not be definitely proved as this foreign vessel departed as soon as hull repairs could be completed and the telemotor system was not torn down for closer examination.

Although this collision could be blamed entirely on the unforeseen maneuvers of the Liberty ship, there were other factors involved. For one thing, neither vessel blew a whistle signal of one blast, the passing signal signifying a port-to-port passage, as required by Article 18, Rule I, Inland Pilot Rules. This omission apparently had no bearing on the cause or results of the collision, but indicates a lack of complete alertness and compliance with the intent of the law on the part of each vessel. In this case, the anticipatory mind, the mind which is always keeping a weather eye on what "the other fellow" is going to do, would have paid handsome dividends. Even an immediate positive change of course to the right as soon as the first veer of the outbound Liberty to port was detected might have prevented the collision or greatly reduced the damage.

Proper indoctrination of young mariners always includes advice and practice in anticipating trouble. The wise and alert young deck officer who has the bridge watch, steaming along uneventfully and with nothing in particular to worry about at the moment, will do well to cultivate the habit of anticipating trouble and thinking out the proper emergency actions he should take. He will ask himself such questions as: "What should I do if fire were to break out in the engineroom, *right now?* What should I do if that AB on deck were to fall overboard, *right now?* What should I do if that approaching steamer were to take a sheer toward me, *right now?*" That such anticipatory thinking should by no means be confined to young officers just learning their trade, is amply demonstrated by the above collision.

⚓ ⚓ ⚓

FATAL WRENCH

The point at which a shipboard tool changes from a valuable friend and ally to an unfriendly instrument of injury is difficult to define, or anticipate. For instance, a high speed abrasive grinding wheel is extremely helpful in sharpening tools until the moment when a speck of abrasive material flies up and becomes embedded in the eye. An ordinary cross-cut carpenter's saw is indispensable aboard ship until the moment it flips out of the kerf and rakes a slice out of the fleshy part of the hand. A keen anticipation of what the tool can do at the instant something goes wrong is an integral part of any shipboard safety program and must never be overlooked for a moment by the maritime craftsman who would work safely.

A good case in point occurred recently aboard a dredge which was operating on the Inland Waters. Two men were using a wrench to set up on some heavy nuts when the inevitable slip, which they were not expecting, occurred and both went sprawling. One was injured so seriously that he died the next day. The cause of the accident was so simple and predictable that the only surprising aspect was the fact that both men were totally unprepared for what happened.

The Chief Engineer and an oiler were engaged in making repairs to the bearings of the starboard swing winch. This winch was used to swing or veer the dredge by means of heaving in or paying out on a cable and anchor. They had adjusted and aligned bearings, using shims, and were replacing the bearing cap nuts using a ratchet socket wrench. These cap nuts were $1\frac{5}{8}$'' o. d. The socket used was for $1\frac{11}{16}$'' nuts, or $\frac{1}{16}$'' too large. The oiler later claimed that the only proper sized socket aboard had been locked up by someone who had gone ashore and that they did not know where the key was located. The socket wrench handle was 18 inches long and the two men were using a 3-foot length of $1\frac{1}{2}$'' steel pipe as a "cheater," or extra lever arm. There was a good snug fit between the pipe and the wrench arm.

After setting up all the cap nuts but one, with considerable tension, and with no trouble, the two men placed the socket on the last cap nut and commenced to set it up. Just as the final tension was being applied, with both men leaning heavily on the pipe extension, the oversized socket slipped off the nut and both men sprawled across the deck. The oiler was struck on the face with the pipe handle but was not seriously injured. However, the Chief Engineer struck the door of the cage-type electrical enclosure in the small of his back, on the right side. Unable to get up, the injured man could only groan and ask for the Master. As soon as the Master arrived, the Chief Engineer insisted on crawling onto a stretcher by himself. He was removed from the ship on the stretcher and taken ashore by motor launch

National Safety Council

where he was transferred to a hospital as rapidly as possible. Unfortunately he died the next morning from complications arising from a rupture of the spleen, fractured ribs, and liver injuries.

Here was a needless death. While the use of the oversize socket was either poor judgment or just plain laziness, it might have been gotten away with if a little more care had been exercised, since all of the cap nuts had been set up without accident until the last nut. Knowing the socket was slightly loose, the two men heaving on the pipe lever should have been overly cautious, even to the point of expecting the socket to slip, and being prepared for it. Many occasions arise aboard a ship when a man must heave on a line, wrench, or heavy weight and oftentimes the sudden release of resistance to heaving will set up a bad fall. It is difficult to conceive any such occasion when the man who must exert such force cannot anticipate and be ready for such tripping, breaking, slipping, or other mischance and be capable of saving himself from injury or fall. It is certain that such a consciousness in the minds of seamen serving aboard ship will only be proportional to the overall degree of safety-mindedness which has been engendered on board or in their previous training.

SAFETY TANKERS

(*Continued from page 115*)

docks, gas in the pumproom and gas in a supposedly gas-free tank. Even though they did not occur on one of our ships, the memory is just as unpleasant as if it did. We had one man disregard all our rules—overcome and revived—now it's eliminate, if at all possible, the sources, its more effective than instructions.

Store loading arrangements simplified by special hatches and air operated booms on the after end to handle aluminum baskets from storehouse to seamule to ship, with the men handling the stores only from the basket to the immediate vicinity of the deck where storerooms are located for engine and stewards' stores and supplies.

Special attention to location of ladders, types of steps, railings, closures and lighting.

Elimination of all obstructions on deck where possible, especially in vicinity of deck winches, cargo tank valves and sounding pipes.

The cargo tank spaces are the vital spots in safety for an operator to supervise. In their empty state, after discharging a cargo of volatile hydrocarbons, they are a great source of danger, particularly in a collision or when being gas-freed in preparation for drydock and repairs. We have a strong faith in our CO_2, inert flue gas system for displacing the cargo with washed and cooled flue gas from the boilers, for preventing the presence of explosive mixtures of air and hydrocarbon vapors in the cargo tanks. Our experiences before, during and after World War II have justified our faith in its continued use. Most recently, the Navy after extensive tests, issued an endorsement of this system for prevention of explosive mixtures.

Hand in hand with this system is the adoption of ullage standpipes extending to within 18" of the tank bottom that gives you a system of closed venting that eliminates presence of explosive fumes around the deck while loading cargo or ballast and obviates the necessity of an ullage opening direct into the cargo tank vapor space. I mentioned the dangers of gas-freeing cargo tanks that previously contained a volatile petroleum cargo. Tanks that have been hot water washed must be opened after the washing to rid the tank of vapors. At some point after the tank is opened for venting, the mixture of air and petroleum vapors is ideally suited for explosion—the stage of explosive mix. We have added mechanical steam driven blowers to reduce this time period to a minimum, instead of using windsails which are useless on a windless day. Eductors have been installed in the stripping line to eliminate a great deal of the mucking and rust scale removal with buckets—another source of injuries on tankers. The eductors on the stripping line in conjunction with the inert gas blower also perform a good job in ridding the tanks of explosive vapors before the hatches are opened.

On deck, the lookout telephone at the bow saves time and uncertainty in making reports to the bridge. We must not overlook the loran, radar, loudspeaker systems as necessary safety measures in any new ship today. The motor boat was equipped with an electric starter. Maybe I would still have with me a mighty fine Chief Engineer if it wasn't for that hand-cranked engine that broke his arm so bad, it ultimately cost him his life. We used aluminum in a great many places for the advantages it possesses over steel—in lifeboats, gangways, ladders, staging, chain falls, and the fore and aft catwalk gratings.

In the scullery, a garbage disposal unit replaced the messroom slop bucket and sinks came out of the messroom to be replaced by the dishwasher. The gripes and broken toes won out over the old time ice-making set, and the automatic ice-cube maker found its way on board.

The engineroom skylights go up or down with the press of an electric button, because the trip up three flights of ladders and mulehauling the old-fashioned lifting gear are just two more invitations to accident trouble. The painting scheme for the engineroom was developed from an industrial plan to eliminate fatigue. Machinery and bulkheads are in shades of blue, handrails—yellow, danger points—red.

The old 12-quart bucket and steam line are gone with the scalds and burns on laundry day. The buckets and the accidents were too expensive, so the automatic washer and electric dryer in their own laundry room found a place in the specifications.

A special space was set aside on the Captain's deck for a dispensary, fully equipped to handle first aid cases. A man doesn't like to mess up a Captain's quarters and the Captain doesn't like it either, so we tried to make their meeting ground more conducive to cordial relations. In this manner we hope each minor ailment or injury will receive its proper attention by both parties. Supplementing the usual fresh air mask and Chemox mask, the ship was equipped with an Emerson resuscitator for emergencies.

For the protection of engineroom, fireroom and pumproom the Cardox bulk storage tank and system replaced the very large number of CO_2 cylinders which would have been required. The mechanical foam system was tied into the fire line system throughout the ship for fire protection.

It has been our experience over the years that the large majority of accidents occur among the new men assigned to a ship. Either the older hands are aware of the pitfalls on the ship, or they develop a feeling of pride in good safety record is subject matter for a debate. So it's to our best interests to have the men like their ship and want to stay on it. A man may like his ship because he has good shipmates, good supervision, and enjoys his work, but he may forsake all these if it lacks some of the comforts he might get in a shore job. This fact impelled us to provide him with quarters, recreation space and recreational activities that would make the ship attractive to him. Some may believe we went overboard with box springs and mattresses, a recreation room that compares with a passenger ship movies, television, radio phonographs and an up-to-date library. But in our thinking, a happy man is a good

worker and a good worker is a safe worker. Both officers and men received every consideration for their comfort, safety and welfare—many of the improvements the direct result of the questionnaire to the officers.

CREW SELECTION AND TRAINING

The ultimate in design, the finest of equipment will only give you performance that is as good as the men who man the ship. You will notice I have repeatedly referred to the need for vigilance, caution and good judgment on the part of those that take these big ships to sea. It is only a part of the plan to select the senior men in service who have demonstrated ability and good judgment. Selection goes all the way down the line. In preparation for assignment to the ship, those officers and petty officers who have not already taken the course in firefighting at the Navy Fire and Damage Control School are sent to this course. (For this privilege we are sincerely indebted to the U. S. Navy.)

Planned casualty drills are executed and conditions simulating possible events and personnel injuries are reenacted, using the different safety and fire fighting equipment on the ship. After the drill, a critique is held on the after poop deck, at which all hands are free to offer criticisms or suggestions on the effectiveness of the drill. These drills have generated a great deal of enthusiasm and interest and are much more effective than the "run out hoses, lower the boats" routine.

SHIP SAFETY PROGRAM

Safety meetings, attended by all hands not on duty, followed by a ship inspection tour that notes location of all emergency and fire fighting equipment as well as any unsafe condition of equipment. Personal, individual instruction is given in the use of resuscitator, chemox mask, fresh air masks, as well as actual use of fog and fog-foam applicators. These full scale safety meetings are held at least once each month and detailed reports filed with the office and the Safety Director. These reports are reviewed by Management and any suggestions therein are promptly answered.

The Safety Director makes occasional voyages, particularly on a new ship, or one that shows a slackening of safety interest. New employees are all given booklets which list the "do's" and "don'ts" of safety for their guidance. All ships are visited in their home port by the Safety Director and staff members to check on safety requirements, condition of safety and rescue equipment.

All this sounds like the onus of responsibility for an active safety campaign rests with the ship personnel and the brass sits back and takes the credit, if there's any coming that way. Factually, the personnel of the ship make the records in all respects, and a fine safety record is one made possible by the active participation of every man. I feel a very warm measure of satisfaction when a wiper or ordinary seaman bounces the ball right into the head pin with a question or a suggestion like safety shoes for ladders, in a ship safety meeting. And the Captain, whose latest bent is photography and the dark room, turns his talents to photographic safety masterpieces, not only for his own ship, but for the whole fleet. Still he scorns my suggestion to pay for materials, and considers it all as his donation to safety. His photographs are enlargements in glossy prints 8" by 10" with crew members acting out the message. The last message was a masterpiece showing a man lying on the deck after being hauled out of a tank unconscious, and the Emerson resuscitator opened at his side while two shipmates read the instructions on the equipment. The slogan superimposed in large black letters states "Time is Running Out."

A salute to the Chief Engineer, ex Chief Engineer of a large aircraft carrier, who brought his wealth of experience and enthusiasm back with him, to write up a detailed casualty drill and didn't give up until he sold it to the skipper. Now he's authoring drilling of various descriptions, because the crew loves them.

What's the shore gang doing to aid and abet this spirit? Mostly showing appreciation, and carrying through on suggestions. But there's the monthly accident and analysis report sheets—no punches pulled. The monthly check list selects various equipment, hazards and locations in each department of the ship for the different departments to inspect. The "Coffee Quiz" each month is posted asking questions on the ship and equipment, and listing four or more answers to same, only one of which is correct. These they read and argue about. The monthly safety letter is written in a personal vein to the Safety Committee, the Master and the Chief Engineer. Then we feed them the usual needlers—posters, safety films (of which there is a dearth for marine use).

SAFETY AWARDS

The year is ended, the scores are added up and the record stands. You feel sorry for the ships that gave their all only to have a perfect record marred by a silly accident. But your pride for those who made a clean sweep, finds you asking the President of your Company to honor each ship with an award that carries his signature. You proudly tote it aboard and tell them personally and individually "Well Done."

You reserve one for last because with it goes the safety plaque for the ship without a lost time accident over the largest number of man hours of exposure. You can't say much to this gang about safety, because they're telling you—"Five Years Without a Lost Time Accident."

Now must we have the "Safety Man of the Month" and the "Safety Man of the Year." They demand personal recognition for the most untiring work or constructive suggestions during the year. They're not asking for awards, cash prizes or gifts. They want their story publicized in the Company's monthly newspaper. In my opinion it's good, and it came off the ships.

Perhaps I have wandered away from the dock where the supertanker was tied up, and found myself back on some of her older sisters, but the game's the same, big or little, they must all play by the same rules. I have no illusions this program is any better than yours. We're all striving to improve our safety records, using our ingenuity to devise new approaches, calling on the resourcefulness and skill of our personnel. Our tanker industry has done a fine job selling safety and making it a reality. Why then, I ask you, must we be cast aside by proposals to legislate safety into our ships by another Government Bureau? Don't they know we are doing a good job? Don't they know safety on American ships is a function and responsibility of the U. S. Coast Guard? And here I pay tribute, in which I am sure you all concur, to the very fine publication "Proceedings of the Merchant Marine Council, U. S. Coast Guard." I read every word of it and send out a monthly letter enumerating the articles in each issue, which should be read by Masters and Mates, Chief Engineers and Assistants or the Safety Committees.

No amount of safety legislation can substitute for the initiative, resourcefulness and enthusiasm of an American ship crew and operators to keep moving forward in achieving even better safety records. And legislation cannot by threats of fines exact from men their personal pride in accomplishing a noble record in human preservation—that is one of the prerogatives of private enterprise and private initiative.

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

Suchapter E—Load Lines

[CGFR 55-15]

PART 43—FOREIGN OR COASTWISE VOYAGE

PART 45—MERCHANT VESSELS WHEN ENGAGED IN A VOYAGE ON THE GREAT LAKES

FEES FOR ASSIGNMENT OF LOAD LINES

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), to promulgate regulations in accordance with the statutes cited with the regulations below, the following amendments to the regulations are prescribed which shall become effective thirty days after the date of publication of this document in the Federal Register:

1. Section 43.40–5, including Table 43.40–5 (a), is amended to read as follows:

§ 43.40–5 *Fees, travel expense*—(a) *Scale of fees.* (1) Subject to the conditions as set forth in this paragraph, fees payable by owners will be charged for assignment of load line (including load line and condition survey, verification of markings and issuance of load line certificates) in accordance with Table 43.40–5 (a).

TABLE 43.40–5 (a)—FEES FOR ASSIGNMENT OF LOAD LINE

Size of vessel	Classed vessel [1]	Unclassed vessels
Under 200 gross tons	$30.00	$100.00
200 and under 400 gross tons	30.00	125.00
400 and under 700 gross tons	35.00	155.00
700 and under 1,000 gross tons	40.00	190.00
1,000 and under 1,500 gross tons	40.00	230.00
1,500 and under 2,500 gross tons	50.00	270.00
2,500 and under 3,500 gross tons	60.00	310.00
3,500 and under 5,000 gross tons	70.00	350.00
5,000 and under 6,500 gross tons	85.00	390.00
6,500 and under 8,000 gross tons	100.00	430.00
8,000 and under 10,000 gross tons	110.00	470.00
10,000 and under 12,000 gross tons	120.00	510.00
12,000 and under 15,000 gross tons	130.00	550.00
15,000 gross tons and above	140.00	590.00

[1] Classed vessel means vessel in class with the assigning authority.

(2) In the case of unclassed vessels newly built, where an extensive review of construction plans and attendance during construction by the Surveyors of the assigning authority may be required, in the case of existing unclassed vessels where necessary plans are not available, and in cases where alterations or repairs are made, which would require more than a normal attendance by the Surveyors, additional fees proportional to the amount of work involved may be charged.

(3) The provisions of this paragraph may be applied to either classed or unclassed vessels in cases where, due to alterations or changes in service, a new freeboard may be required.

(h) *Fees for renewal of load line certificates.* (1) For unclassed vessels the fees for condition survey and renewal of load line certificates shall be 50 percent of the scale in paragraph (a) of this section. In cases where alterations or repairs are made which would require more than a normal attendance by the Surveyors, additional fees, proportional to the amount of work involved may be charged.

(2) For classed vessels where the survey is carried out in conjunction with a survey required for maintenance of class and for which a fee is chargeable, no charge will be made for the survey, but an amount not exceeding $25 for the issuance of the new load line certificate may be charged.

(c) *Fees for annual load line inspection.* The fee for annual load line inspection shall be $25 for vessels not exceeding 2,000 gross tons, and $35 for vessels of more than 2,000 gross tons. Where alterations or repairs are made, which would require more than a normal attendance by the Surveyors, additional fees proportional to the work involved may be charged. In the case of a classed vessel no charge will be made for this inspection if carried out at the same time as a survey to the hull that is required for maintenance of class and for which a fee is chargeable.

(d) *Traveling expenses.* For all traveling expenses incurred in connection with the surveys described in this section there will be an additional charge.

(Sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended; 46 U. S. C. 85a, 88a)

2. Section 45.20–75 is amended to read as follows:

§ 45.20–75 *Fees.* Fees payable by owners will be charged for the assignment of load line, renewal of load line certificates, and annual load line inspection, in accordance with the regulations set forth in § 43.40–5 of this subchapter.

(Sec. 2, 49 Stat. 888, as amended; 46 U. S. C. 88a)

(Federal Register of Tuesday, April 12, 1955)

ACCEPTABLE COVERED STEEL ARC WELDING ELECTRODES

The following are additions to the list of electrodes which are acceptable to the United States Coast Guard for use in welded fabrications.

Distributor's and/or manufacturer's	Brand	AWS class	Operating positions and electrode sizes (inch)				
			5/32 and below	3/16	7/32	1/4	5/16
Babcock & Wilcox Co., The, 161 East 42d St., New York 17, N. Y.	B & W 75 [1] (½ Mo)	E7020	2	2	2	2	3
Reid-Avery Co., Dundalk, Baltimore 22, Md.	Raco 13	E6013	1	1	3	2	3

[1] Acceptable for use with alternating current only.

EQUIPMENT APPROVED BY THE COMMANDANT

[EDITOR'S NOTE—Due to space limitations, it is not possible to publish specification numbers, approval numbers and other descriptive data regarding approvals and termination of approvals as published in the Federal Register. Copies of the Federal Registers may be obtained from the Superintendent of Documents, Washington 25, D. C.]

DEPARTMENT OF THE TREASURY

UNITED STATES COAST GUARD

[CGFR 55–19]

TERMINATIONS OF APPROVALS OF EQUIPMENT

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 in compliance with the authorities cited below, the following approvals of equipment are terminated because (1) the manufacturer is no longer in business; or (2) the manufacturer does not desire to retain the approval; or (3) the item is no longer being manufactured; or (4) the item of equipment no longer complies with present Coast Guard requirements; or (5) the approval has expired. Except for those approvals which have expired, all other terminations of approvals made by this document shall be made effective upon the thirty-first day after the date of publication of this document in the Federal Register. Notwithstanding this termination of approval of any item of equipment as listed in this document, such equipment in service may be continued in use so long as such equipment is in good and serviceable condition.

BUOYANT CUSHIONS, NON-STANDARD

BOILERS, HEATING

APPLIANCES, LIQUEFIED PETROLEUM GAS CONSUMING

(Federal Register of Saturday, May 7, 1955)

ARTICLES OF SHIPS' STORES AND SUPPLIES

Articles of ships' stores and supplies certificated from March 29 to April 29, 1955, 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

Hagan Corporation, Hagan Building, 323 Fourth Avenue, Pittsburgh 22, Pa. Certificate No. 201, dated March 30, 1955, HAGAMIN (MARINE FORM).

Hagan Corporation, Hagan Building, 323 Fourth Avenue, Pittsburgh 22, Pa. Certificate No. 202, dated March 30, 1955, MARAMIN.

The Dow Chemical Co., Midland, Mich. Certificate No. 203, dated April 26, 1955, CHLOROTHENE.

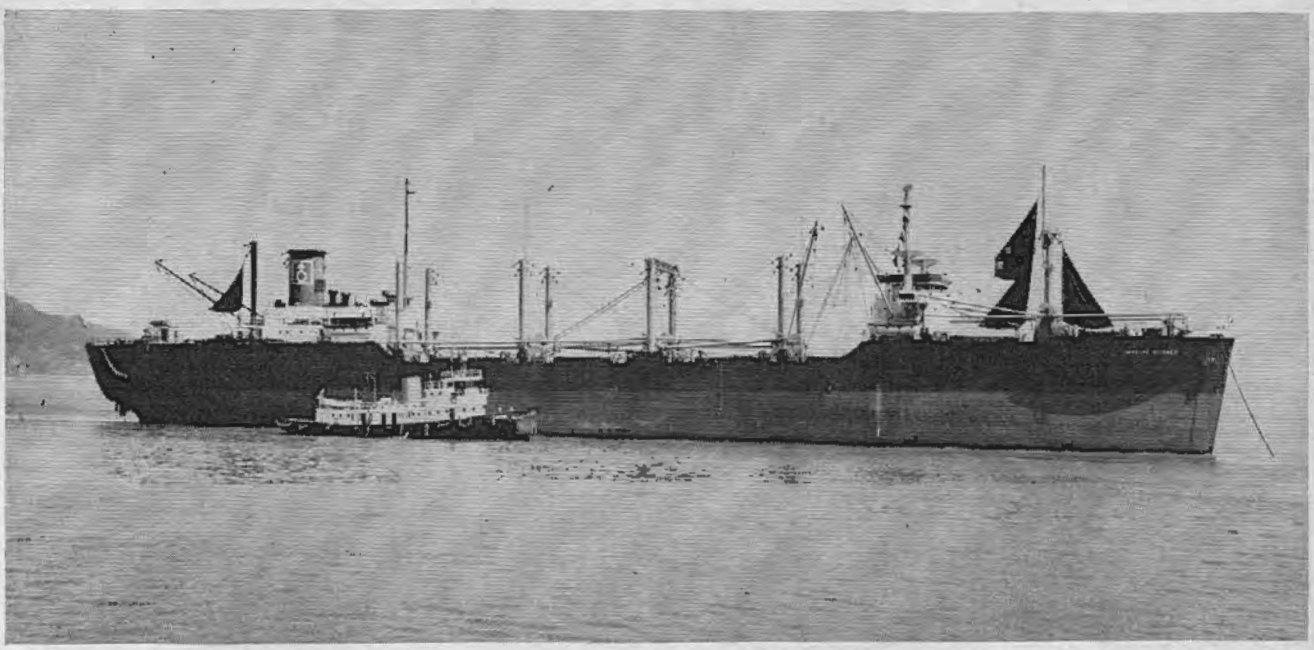
AFFIDAVITS

The following affidavits were accepted during the period from March 15, 1955, to April 15, 1955:

Barber-Colman Company, Rockford, Ill., VALVES.

Federal Bronze Products, Inc., 2 Wheeler Point Road, Newark 5, N. J., CASTINGS.

Howard Iron Works, Inc., Buffalo 4, N. Y., FITTINGS.



Subsequent to the publishing of the May issue which contained the article "A Jury Rudder Plus Four Sails," the editor received the above photograph from Mr. Jack Ledford, who was Chief Mate during the rudderless voyage. This photograph shows the SS *Marine Runner* on her arrival in San Francisco Bay after her 1,500-mile voyage.

U. S. GOVERNMENT PRINTING OFFICE: 1955

Safe upon the billowy deep,
Loving Lord, thy servants keep;
Helpless, trusting pilgrims they,
Guard them on their watery way.

In the morning fill their sails,
Mid the dark send favouring gales;
If their sky be overcast,
Calm the waves, and still the blast.

Let thy sunshine guide by day;
Send at eve the starry ray;
Through the watches of the night,
Be Thou, Lord, their shining light.

Thus, as hour by hour rolls by,
Watch them with thy sleepless eye:
Guide with thine almighty hand
Safe unto the haven-land.

And at last, life's voyage o'er,
Take us to the heavenly shore,
Safe in port, to dwell with Thee
Where there shall be "no more sea."

Amen.

Henry Coppee, 1887

Courtesy "The Lookout"