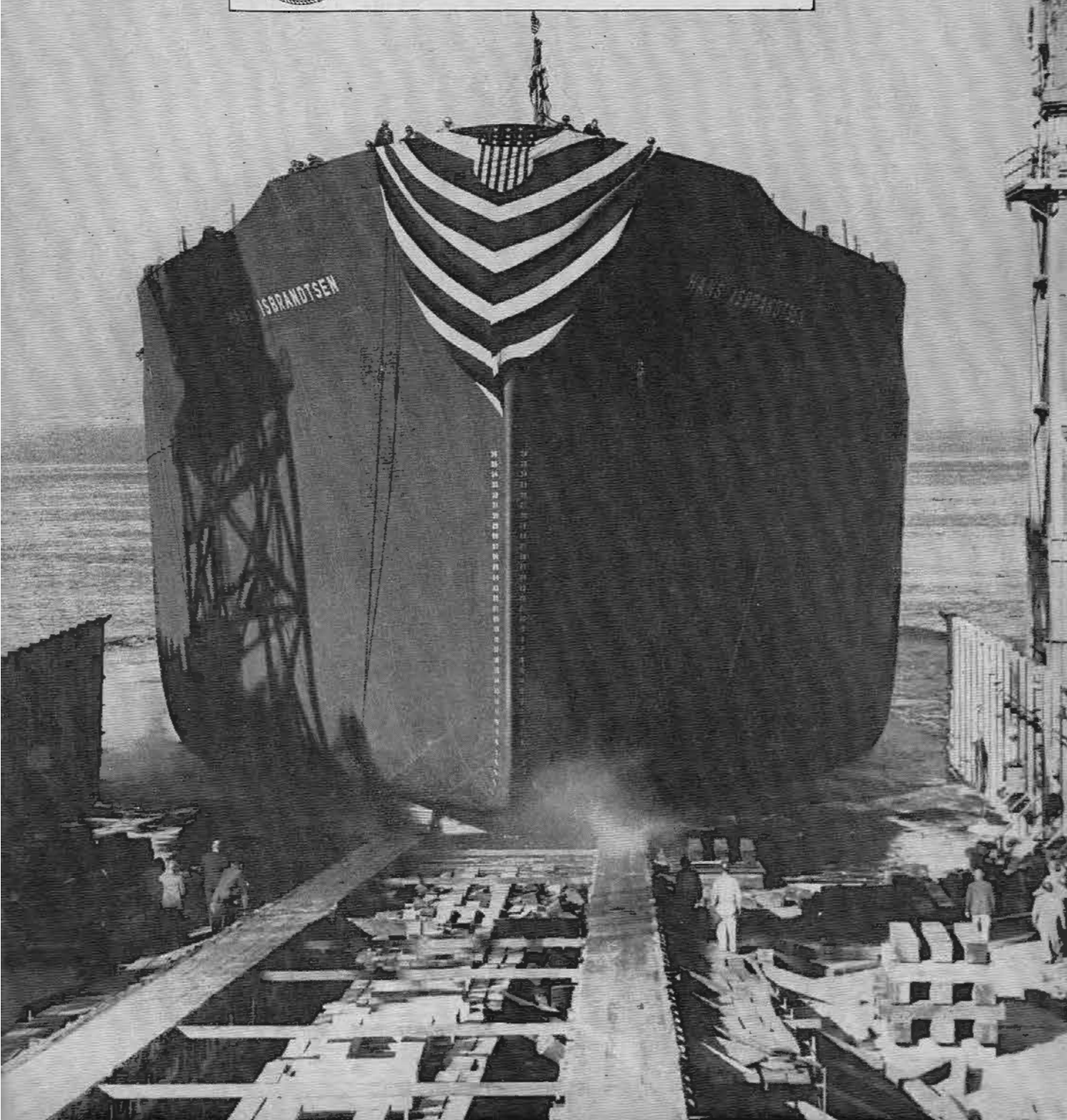
PROCEEDINGS

OF THE MERCHANT MARINE COUNCIL

UNITED STATES COAST GUARD

Vol. 15, No. 9 • September 1958

CG–129



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. Use of funds for printing this publication has been approved by the Bureau of the Budget October 3, 1957.

CONTENTS

DISTRIBUTION (SDL 67)

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

COMMENDATION

IN ADDITION to the Coast Guard Commendation presented to Capt. Birger Jacobsen reproduced below, a copy of this citation was presented to each member of the crew for their strenuous efforts in saving the vessel. Their participation in this outstanding demonstration of seamanship has been entered in their records of service which is maintained at Coast Guard Headquarters.

CAPT. BIRGER JACOBSEN, MASTER
SS Columbia Trader
% West Coast Steamship Co.
Portland, Oregon

DEAR CAPTAIN JACOBSEN:

The U. S. Coast Guard, as the principal agency of the United States charged with the safety of life and property at sea, takes pleasure in this opportunity to commend you, as Master, and the officers and members of the crew of the SS *Columbia Trader* for the praiseworthy seamanship demonstrated on 7 January 1958 when a major structural failure occurred to the ship in the North Pacific Ocean during a gale, with sub-freezing weather and very rough seas.

Official reports of the incident indicate that at 0715 LCT on 7 January 1958 when the *Columbia Trader* was in position 46°57' North, 164°37' East en route from the United States to Japan, at reduced speed because of the adverse weather and sea conditions a crack occurred across the main deck of the ship. The vessel was hove to, stern to the sea, and an "All Hands" effort begun to prevent the ship from breaking apart. Both anchors were stopped off, the anchor chains led aft over the boat deck, port and starboard, secured to the after bitts and made taut by use of the anchor windlass and tackle. Insurance wires were also rigged. This operation was completed within seven hours under difficult and dangerous conditions but without injury to personnel. Large turnbuckles mounted to pad eyes were then welded at intervals along each side of the main fracture, the bow section of which was approximately six inches below the after part. By a process of jacking and taking up on the turnbuckles the crack was finally joined. The entire operation extended over two days of unceasing effort. The welding by members of the crew was of such quality that no cracks in the welds were evident upon the arrival of the ship at Adak, Alaska.

It appears certain that but for the skill, ingenuity and determination of everyone on board, the *Columbia Trader* would have been lost. This achievement was in keeping with the highest traditions of the American Merchant Marine.

Very truly yours,

A. C. RICHMOND,
Vice Admiral, U. S. Coast Guard,
Commandant.

STATES MARINE TO OPERATE NS SAVANNAH

SPECULATION over the naming of an operator for the world's first nuclear-powered merchant ship has come to an end.

Officials of the Maritime Administration and the Atomic Energy Commission said in a joint announcement that States Marine Lines has been selected to man and sail the NS *Savannah* when she goes into operation in 1960.

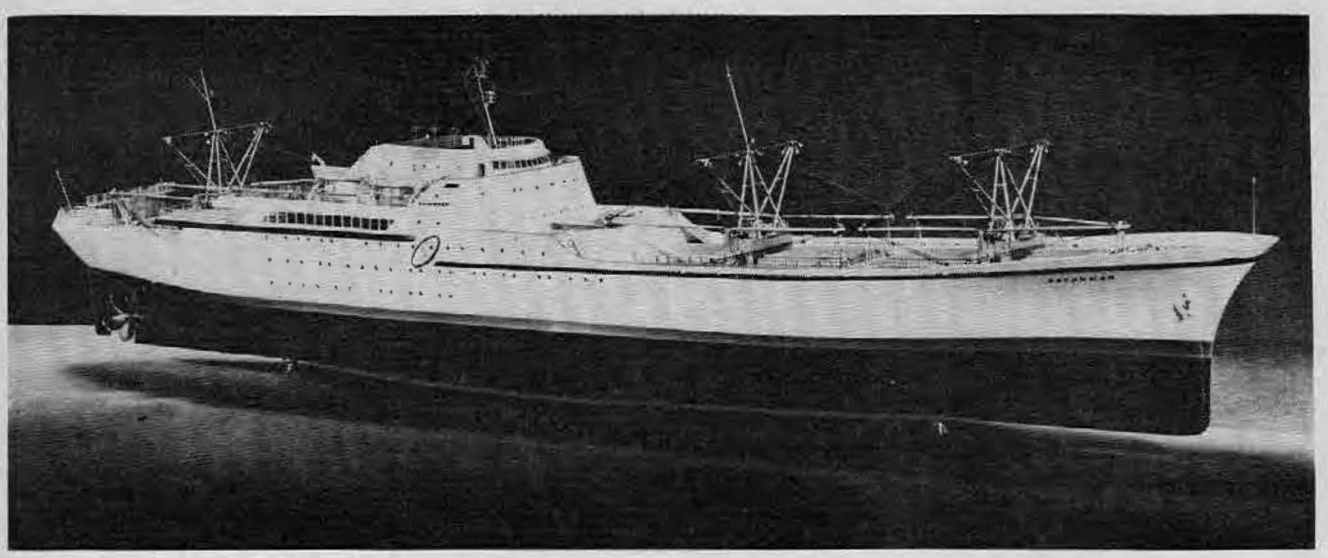
Being built in the Camden, N. J. yard of the New York Shipbuilding Corp., the *Savannah* will be a combination passenger-cargo vessel, 595½ feet long, with 78-foot beam, capable of carrying more than 60 passengers and 9,500 tons of cargo at a speed of 20 knots. It is expected the ship will operate for over three years on its initial fuel loading, Maritime Administration indicated.

Essentially a freight line, States Marine will be aided by Matson Navigation Company in handling future passenger travel, it was announced. States Marine was organized in 1930, and with its totally owned subsidiary, Isthmian Lines, Inc., owns 39 United States flag ships, and has an average of 35 vessels under time charter on the trade routes they serve.

The schedule for the proposed operation of the *Savannah*, after her delivery, is in three phases:

- Phase I—Initial trials and tests—6 months to a year.
- Phase II—National and international operation in modified commercial service for operational evaluation purposes.
- Phase III—Commercial operation in passenger-cargo services.

At the time of his announcement of plans to build the first commercial nuclear-powered vessel, President Dwight D. Eisenhower said: "This new vessel will be a floating laboratory, providing indispensable information for the further application of atomic energy in the field of ocean transportation. The reactor will be built on an unclassified basis. It will be possible for engineers not only of our own country, but of other nations, to view the nuclear powerplant and see at first hand this demonstration of the great promise of atomic energy for human betterment."



MARINE ENGINEERS FOR NUCLEAR PROPELLED VESSELS

WITH THE publicity attendant to the naming of the operator for the first nuclear propelled merchant vessel the N. S. *Savannah* there have been many inquiries made from marine engineers concerning the licensing and the training of the engine department personnel for this and other similarly propelled vessels.

Marine engineers who are to be employed in connection with the Nuclear Reactors on Coast Guard inspected nuclear propelled vessels will be required to be in possession of both a Coast Guard license of appropriate grade as Marine Engineer and an Atomic Energy Commission license as a Nuclear Reactor Operator. The "dual licensing" requirement is due to the fact that the Atomic Energy Commission is required by statute (Title 42, U. S. Code 2137) to license Nuclear Reactor Operators whereas the U. S. Coast Guard is required by statute (Title 46, U. S. Code 224) to license the engineers of merchant steam vessels of the United States.

In order to provide for the training of the crew and the construction of the first nuclear propelled merchant vessel, the 84th Congress passed Public Law 848 (Title 46, U. S. Code 716), which authorizes the Maritime Administration of the Department of Commerce to train the crew for this vessel in the operation of nuclear propulsion machinery; the crew to be furnished by the shipping company selected by the Maritime Administration to operate this vessel.

The Maritime Administration has announced that a training program has been established for the operating engineers of the N. S. *Savannah* to assure continuance on nuclear-powered merchant ships of the high standards of proficiency and reliability of the conventional ship operating engineers of the U. S. Merchant Marine. This training program will include a reactor simulator of the N. S. *Savannah* reactor propulsion system and a full scale mock-up of the reactor system will be available. Two crews of licensed engineers will be selected for this training from the

(*Continued on page 172*)

475401—58

A WORKING PARTNER IN THE MARINE INDUSTRY

By Lt. Comdr. Robert I. Price, USCG

EXAMPLES OF THE COAST GUARD as a working partner in the marine industry are illustrated in these two photographs. At the right a boiler inspector and a ship's officer check safety valve seals, and at the left a hull inspector is marking up a pipe with the shipyard representative.

THE HISTORY of Merchant Marine Inspection reaches back over a century and a quarter in a repetitive pattern of marine calamity, public outcry, and eventual legislative action. It is regrettable that it often takes a loss of life to underline the need for remedial action.

The names of the unfortunate ships upon which catastrophe has fallen have become milestones in our progress toward safety in water transportation. The roll call of their names still conveys the sense of disaster—*General Slocum, Titanic, Morro Castle, Mohawk, Marvel, Andrea Doria.*

The scope of marine inspection has broadened with each effort to prevent the recurrence of disaster. The agency responsible for administration of marine safety has changed also, the mantle of responsibility having passed through the hands of the Steamboat Inspection Service, the Bureau of Marine Inspection and Navigation, and now the Coast Guard.

The contract specifications for vessels of American registry list among the regulatory bodies whose requirements must be satisfied—"U. S. Coast Guard." Somehow the vision you get from the words—"regulatory body"—is of a policeman with his foot on the bumper of one's car. Now there is no denying that the Coast Guard is a law enforcement agency, and has been since Alexander Hamilton established the Revenue Cutter Service, progenitor of the Coast Guard, nearly 170 years ago. But "regulatory" does not properly explain the Coast Guard's relationship to the marine industry.

INDUSTRIAL INSPECTION

To get a better perspective, suppose we look at "inspection" in its current industrial meaning. Inspection in the industrial sense is the child of progress in the engineering profession. Each improvement in the application of machines, materials, and labor has brought with it a need for improved measuring devices, closer tolerances, and more specific specifications.

Industrial organizations have found that inspection is essential to maintaining the course between customer dissatisfaction and loss of business reputation on one hand, and unprofitable operation through waste and over-design on the other. While quality is a comparative term, it is a modern business necessity.

A modern, industrial definition of "inspection" is, therefore, the method of controlling a pre-established quality standard.

The place of inspection in the industrial organization varies from one establishment to another, but there is a definite trend to providing inspection as an independent management function of responsibility separate from the other two industrial divisions which are directly involved in the development of the product, namely, production and design. The quality control relationship of design, production and inspection has been compared to the "checks and balances" of the national government as demonstrated by the legislative, executive and judicial branches. In the comparison attributed to Dr. Radford of Cornell University, Congress makes the laws as design conceives the specifications, the President carries out the laws as production undertakes to accomplish the requirements of the product, and the Court checks the manner of accomplishment against the law as inspection confirms compliance with the specifications.

The Coast Guard's relationship in the marine industry is similar to that of the industrial inspection force in an assembly or process plant, that is, Coast Guard Inspection is an independent function exercised by a part of the marine industry management.

FORMULATION OF STANDARDS

By definition, inspection requires standards. In the industrial organization, the level of quality required in the product is a vital question upon which the financial future of the enterprise depends. This crucial matter is normally resolved by the interchange of ideas, views, and studies between representative of the various departments of sales, production, design, procurement, and inspection. The standards established are management decisions reached after all

factors have been weighed for their effect.

In a manner similar to that by which a company arrives at its standards, the safety standards for the American marine industry are brought about by the management of the industry, not by a dictatorial "regulatory body." The opinions of all interested parties: naval architects, marine engineers, shipyards, operators, owners, crew and public are solicited and evaluated.

Here the Coast Guard—the inspection representative—plays an additional role, that of coordinator. The formal mechanism by which the changes are made in the Coast Guard's published regulations for the marine industry is the Merchant Marine Council. The Council functions as a board of directors advising the Commandant regarding rules affecting the merchant marine. Panels of consultants from the marine industry have been selected to assist the Council in studying and making recommendations. The public hearings, which the Council holds preliminary to a change in regulations, constitute the discussion and evaluation phase during which the opinions of the entire industry are invited.

ABOUT THE AUTHOR

A 1945 graduate of the Coast Guard Academy, Lt. Comdr. Price served afloat in various capacities until his selection for post-graduate training at M. I. T. He was graduated in 1953 with degree of Naval Engineer. Following a year in the Coast Guard Yard as a ship superintendent on new construction and repair work, he returned to sea as engineering officer of the USCGC *McCulloch*. Since 1955 he has been assigned to the Merchant Marine Technical Division at Coast Guard Headquarters where he presently is serving as Chief, Hull Arrangements Branch. The remarks presented here have been excerpted from Lt. Comdr. Price's paper presented at the Spring meeting of the New England Chapter of the Society of Naval Architects and Marine Engineers held at the Coast Guard Academy, New London, Conn.

At a higher level, industry representatives directly advise the Commandant relative to broad matters of marine safety prior to seeking enabling legislation. At the present time, the M–13 Panel of SNAME on the application of nuclear energy to marine propulsion is one such group. Another is a special committee on Damage Stability, Ballasting and Subdivision, an outgrowth of the *Andrea Doria* disaster, that has been set up to investigate the status of American passenger vessels, preliminary to a new International Safety of Life at Sea Conference. This group includes distinguished members drawn from every phase of the marine industry. In this connection, an examination of the list of United States delegates to the 1948 Convention and the members of the preparatory committees for the 1960 Convention will show the extent of American marine industry participation in the formulation of world-wide safety standards.

On the shirt-sleeve level there is a continuing interchange between industry representatives, the Officers-in-Charge, Marine Inspection, in the construction areas, and the advisory staffs of the Office of Merchant Marine Safety at Headquarters. The technical staff makes considerable use of standards and studies prepared by professional societies, and, where applicable and adaptable, by trade associations. The codes of such groups as ABS, ASME, AIEE, NFPA, ASTM, API, AWS, and many others are applied whenever possible, and efforts are directed to the elimination of duplication and conflicting requirements.

The origin of the stimulus for change, the method of handling and the actual preparation of revisions to the regulations is different in each instance. However, all elements of the marine industry have taken part or had opportunity to participate in the making of these decisions. The safety standards being applied to the American marine industry by the Coast Guard are primarily standards that the industry itself has established.

SCOPE OF INSPECTION

The actual execution of Coast Guard Inspection also follows the industrial pattern. Industrial inspection is carried out from the raw material stage through to the finished product. The need for corrective measures must be detected at the earliest possible point, lest the defective element continue to accumulate charges for material, labor and overhead.

Coast Guard Inspection extends from the design stage in review of preliminary design plans and specifications, to the mill or factory preparing the materials and equipment, to the qualification of the welders who assemble, to the furnishings with which the ship is fitted, to the personnel who man her, to the operating practices under which she is run, and, as in the industrial case, to the investigation of deficiencies and casualties for the purpose of determining where remedial measures are required.

The Coast Guard is aware of the economic necessity for locating deficiencies at the earliest point in the process. Preventive rather than rejective inspection is a definite aim. It is unquestionably cheaper to correct an error on paper than in steel, to correct an unsafe condition or practice before the accident.

The primary responsibility for providing a safe vessel rests upon the marine industry. The Coast Guard cannot inspect safety into a ship. The standards are admittedly general because, with the variation in marine usage, the Coast Guard's regulations are written on the basis of intent, rather than as specifications. There are bound to be questions of interpretation. However, one should point out the error in the use of the word "standard." The regulations are not "standards" at all, but should properly be described as "the minimum acceptable limit." As surely as the defective parts will increase if the production department works to the tolerances, so will the rejection rate increase if the marine designer, builder or operator tries to hew the line of the regulations. Economy lies in designing, building and operating above the lower limit that the regulations represent, to meet the intent, rather than the letter.

The latter tendency gives rise to a kind of professional "sea-lawyer" who seems to collect errors and exceptions, and manages to get them well out of context. All too often when an unsatisfactory condition is discovered, he raises the argument "* * * but you allowed the same thing on the SS *Neversink!*", and we are urged by doubling the wrong to make it right.

This thinking of "wait till inspection finds it" is sometimes practiced in ship operation. We have the owner who will not act on the advice of the ship's officers but would rather, in effect, have the Coast Guard prepare his maintenance schedule. Since "a stitch in time saves nine" is a fundamental rule at sea, this is hardly an economical practice. He is also running the risk of having his sailing schedule interrupted by the "regulatory body." Here we have no question of standards or intent, but a pure matter of procrastination. Reports submitted by Coast Guard inspectors of ships in service contain the following type of deficiencies in lamentable number: "missing fire hoses," "miss-

(Continued on page 173)

THE STOPPING OF SHIPS IN AN EMERGENCY

By J. E. Church

NO MARINE machinery can be reversed *immediately* from full r. p. m. ahead to full r. p. m. astern for a number of reasons. In the first place the maximum engine power installed in any ship will not drive the propeller at full revolutions astern whilst the ship is either going ahead or stationary, even though maximum steam or fuel is applied, and maximum revolutions astern cannot result until the ship is actually going astern as well at considerable speed. In effect, therefore, with any appreciable headway on the ship the application of full *power* astern as soon as possible will in fact only result in *slow revolutions* astern at least for a minute or two, after which the revolutions will slowly build up after about 6 to 10 minutes to about 60 percent of the full ahead revolutions.

Secondly, quite apart from the propeller characteristics mentioned, the difficulty of reversing the engines immediately varies as between different machinery types. But in any case the problem is due to the difficulty in bringing the engines to rest whilst the ship is still moving forward at near full speed because, in the same way as the propeller when driven by the engines will propel the ship forward, so will the inertia of the ship still moving forward after ahead power has been shut off then drive the engines in an ahead direction through the propeller. Therefore, to apply astern power whilst the engines are still being driven at considerable speed in the ahead direction cannot be done without imposing additional stresses on the working parts of the engines over and above that for which they were designed.

STOPPING THE SHIP

Even so, ships usually stop as well as can be expected, except on occasions when collisions occur.

If such an accident occurred it would normally indicate that the vessel was going too fast for the conditions prevailing. If avoiding action is not taken by the Master, the important factor in avoiding a collision is the distance passed over by the ship before actually moving in the astern direction.

A loaded vessel with diesel engines of about 14,000 tons' displacement, trailing to rest from a speed of about 14 knots, will still be moving forward at a speed of 2 or 3 knots 10 minutes after receiving the order to stop the engine.

Mr. Church, the principal superintendent and naval architect of the South American Saint Line Ltd., Cardiff, Wales, has some interesting comments to make about stopping ships in an emergency. His contention is that the "crash full speed astern" is not the quickest way to stop. His remarks originally appeared in "Transactions of the Institute of Marine Engineers," November 1957, Vol. LXIX, No. 11, and permission to reprint these excerpts has been given by the author and the Institute of Marine Engineers.

The engine revolutions will drop from 110 r. p. m. to 40 r. p. m. in about 3½ minutes and gradually come to rest after 4½–5 minutes.

If an emergency stop is demanded, the engine can be reversed quite readily at 40 r. p. m. ahead, i. e. after 3½ minutes, and the engine can be running about 60 percent full speed astern in 4 minutes. With a vessel in the light condition, or with lower initial speed, or with lower initial engine revolutions, the times stated for stopping are considerably less than those stated.

"FULL ASTERN"

Quite apart from the time taken to reverse engines in emergency, however, must be considered the important question of when a crash order full speed astern should be given; generally speaking this indicates that the urgent need is to stop the ship in the shortest possible distance, and if a collision is imminent it is the *distance* required to stop that matters and not the *time* taken to bring the ship to rest. If this is the case it does not follow that the stopping of a ship in the shortest distance is the same thing as ordering a crash full speed astern.

From a practical point of view reduction of speed to dead slow is usually more important than the reduction to stand still. To reduce speed below that at which a ship answers to her helm is seldom helpful in avoiding a collision. The first requirement must be to shut off ahead power because at full speed every second counts. Every second's delay in shutting-off carries the vessel many yards nearer trouble, which no amount of power astern applied later can regain. Second in importance is the estimation of drag when held in the stop position, in which circumstances the power output of the engines is zero. Also, it is generally assumed that power applied in turning the screw astern will be as effective in decelerating the vessel as if used for ahead propulsion, but this can hardly be so because since cavitation occurs the propeller's grip of the water falls almost to zero, and a useless churning up results.

Recent tests have in fact proved that the astern thrust obtainable from a screw at any speed of the ship reaches a peak value at trailing dead slow ahead of the propeller, and possibly again at dead slow astern. After investigating this subject the following conclusions were drawn by L. R. Horne in his paper entitled "The Stopping of Ships" read before the North East Coast Institution of Engineers and Shipbuilders in 1945.

"Once power has been shut off, the propeller speed falls very rapidly to about two-thirds normal and in this 'propeller turning freely' condition the resistance of the hull is augmented by about one-third.

"If the propeller be stopped, the augmentation will be seven-eighths to unity. The negative thrust is slightly higher when the propeller is maintained turning dead slow ahead, than when it is stopped, and possibly also when turning dead slow astern. Completely to control the propeller during an emergency stop (or crash astern) requires a torque not much less than that for full speed. Where this is not available, the braking effect due to 'the propeller turning freely' can be considerably increased by air or electric braking."

From the above it is apparent that were it possible to effect a crash full speed astern instantly then this would *not* be the quickest way of stopping a ship. When it is realized that a screw propeller can only work efficiently when the slip is small—in the neighbourhood of 4 percent to 7 percent—and that if it were possible to reverse it to full revolutions astern whilst the ship is traveling at full speed ahead the slip would be 200 percent and is even 100 percent when going full speed with the ship stationary, it will readily be understood that under such conditions its grip on the water and hence effective thrust is practically nil, and the net effect is a whirling and churning of a mass of water in the propeller aperture, and acute cavitation.

This can be compared to the braking of a motor vehicle, when, as is well known, maximum retarding effect is when the wheels are allowed to revolve slowly in a forward direction but just not allowed to lock. Locked wheels result in a skid or slip and obviously to attempt to spin the wheels at full speed in reverse would make matters worse and the braking or retarding effect would fall off rapidly. In the same way, in stopping a ship the aim should be to keep the propeller slip reasonably low so as to maintain a grip of the propeller blades on the water and the maximum retarding effect will therefore be produced by shutting off power at once and endeavouring to bring engine revolutions down as quickly as possible to dragging slowly ahead, followed by slow astern when the ship has slowed down so that the propeller slip will not reach unreasonable proportions. Full astern will not be effective until the vessel has begun to gather astern way.

Finally, another most important factor must be considered, namely, the use of the rudder during an emergency stop. Nicholls' Seamanship and Nautical Guide particularly stresses these points under the heading "Ship with headway, full ahead to full astern." In the case of single screw ships with right-handed propeller they point out that in the period between full ahead and full astern, the rudder becomes practically useless and that the only thing that is certain is that *at first* the ship's head will fall off to starboard.

Quite apart from the fact that a crash full speed astern is not the quickest way to stop a ship, it will inevitably result in the ship swinging uncontrollably and maybe she will get into other difficulties, during a sudden full astern manoeuvre.

EARLY ACTION

Nicholls, Horne, and others seem agreed that the average ship will travel between four and six lengths from full ahead before coming to rest and this will take 6 to 10 minutes. The stopping distance for most ships therefore would be 2,850 feet or approximately ½ mile. If another ship appears on a colliding course, also at 14 knots, and if both immediately attempt to stop as quickly as possible, the order would have to be given by both ships when they were 1 mile apart in order to bring them both to rest in time to avoid a collision, and if this order were given at any closer distance than 1 mile it would be futile.

If the other ship continued at full speed she would travel nearly ¼ mile for each of the 8 minutes that the first ship was attempting to stop, in which time she would travel 2 miles. Therefore, when 2½ miles away from any ship steaming towards him which looks like colliding with him the Master must *then* decide either to go full astern, or to maintain headway and alter helm. Obviously no Master could be expected to stop and go astern every time he sees a ship 2½ miles away, and this stresses *the importance of using the helm to keep clear at the earliest possible moment or to reduce speed considerably whenever visibility is less than 2½ miles. The more speed is reduced the quicker can an emergency stop be effected.*

CONCLUSION

It is very difficult to measure the exact distance which a vessel requires to come to rest from full speed ahead. Wind, tide, currents and condition of loading will affect the stopping distance, which ultimately becomes a matter of experience, but the basic fact remains that a ship traveling full speed ahead *cannot be suddenly stopped.* It is therefore of the utmost importance to reduce speed at the first sign of impending danger and the early use of the helm whilst ahead power is still being applied may be by far the surest way of keeping clear. If a sudden stop is necessary it is of first importance to shut off ahead driving power *instantly.* Generally speaking, in the three minutes or so following in which the engines take to come to rest, during which they are being driven by the forward momentum of the ship, the dragging effect of the propeller still turning ahead will exert the maximum braking possible. If this is followed by slow astern as the ship's speed decreases, then half astern and full astern, it is probable that the quickest possible stop will be produced. The most effective amount of astern power to be used at successive stages of this manoeuvre will be the maximum which nevertheless avoids acute cavitation of the propeller shown by violent and useless churning and whirling of the water, as this produces little effective thrust.

Finally, each particular ship's handling capabilities will affect the actual procedure decided upon in any circumstances, and these notes are intended to assist in a better appreciation of the problems and for the guidance of those concerned in meeting such emergencies.

A TALL TALE

A recent boiler casualty aboard a large ocean-going vessel points up the importance for special care when transporting some modern cargoes. This casualty caused no permanent damage, but resulted in considerable inconvience and expense in boiler cleaning.

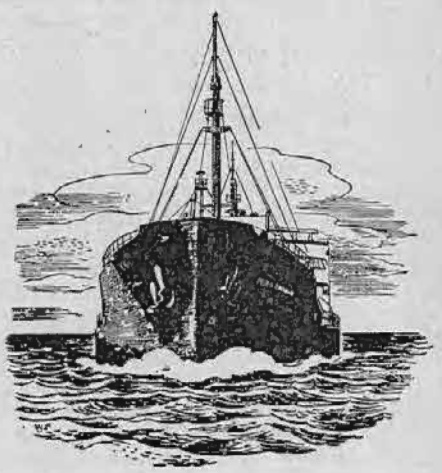
The ship was carrying tall oil in her deep tanks at the time and a leak in a deep tank heating coil introduced the oil into the boiler.

Tall oil, or talloel, is also known as *Unital, Facoil, Liqro, Rosoil,* and *Indusoil,* and is classified in specification ASTM D804–52. It is used in the manufacture of adhesives, asphalt, emulsions, detergents, driers, emulsifiers, lineoleum, and several other products. It has a penetrating unpleasant odor and mixes with water. While being transported it must be kept at 150° F. and will solidify at 100° F.

The first indication of trouble was the discovery of an oil drip from the throttle valve stem. No oil was visible in the boiler gauge glasses nor in the inspection tank. The water in the inspection tank, however, was a grayish color. The superheated steam temperature dropped from a normal 700° F. to 450° F.

The vessel was anchored and used the surface and bottom blow valves before proceeding to a shipyard for extensive boiler decontamination.

The lesson to be learned from this story is one of cooperation. The Mate must keep the engineers informed when unusual cargoes are booked, and the engineers in turn should set up additional precautions to prevent a casualty of this nature. If the cargo is known to be water-soluble and its introduction into the boiler is possible, special care must be exercised in checking the inspection tank and boiler water samples.



MARITIME SIDELIGHTS

SAFEST MOORE-McCORMACK LINES SHIP

SURROUNDED BY happy faces, Captain E. H. Gluck, Pacific Coast Operations Manager, Moore-McCormack Lines, presents the company's first place safety award to Captain H. E. Hansen of the SS *Mormacland* in San Francisco. Chalking up a perfect record with no lost-time accidents in 1957, the *Mormacland* led the entire Moore-McCormack fleet during the year. This is the second year in a row that a west coast ship of this company has won the coveted award. Shown, left to right, are: Morrison Pretz, General Freight Traffic Manager, Moore-McCormack Lines, New York; Omar Brands, Chief Engineer of the *Mormacland;* J. Travers, Manager, Accident Prevention Bureau, Pacific Maritime Association; Captain Gluck; Commander Leonard C. Walen, representing the Coast Guard's Marine Inspection Office, San Francisco; Captain Hansen; A. C. Fenger, Pacific Coast Manager, Moore-McCormack Lines; and John Westrem, Chief Mate, *Mormacland.*

France's tanker fleet totaled about 2 million tons in 1957 and is scheduled to reach 3.8 million by 1963, it was reported in *The Journal of Commerce.* The bigger tanker fleet is part of the French oil industry doubling its investment expenditures.

⚓ ⚓ ⚓

A total of 1,841 Certificates of Inspection have been issued to small passenger vessels under the provision of Public Law 519 as of 7 July 1958, it was announced at Coast Guard Headquarters. Public Law 519, prescribed under the act of May 10, 1956, requires the inspection and certification of certain small passenger vessels which carry more than 6 passengers.

⚓ ⚓ ⚓

Reconversion of four Mariner type ships owned by American President Lines has been awarded to the Todd Corp., Alameda Shipyard. Improvement will be made to passengers accommodation cargo oil tanks, enlargement of refrigeration system, and improvement of the cargo handling gear. The ships involved are the *Magnolia Mariner, Lone Star Mariner, Hoosier Mariner,* and *President Taylor.*

⚓ ⚓ ⚓

All sailing within 3 hours of each other, six transatlantic ships departed from New York early in July with the largest single-day passenger list since World War II. The *United States* had 1,742; the *Constitution,* 980; the *Queen Elizabeth,* 2,139; the *Britannic,* 921; *Maasdam,* 928; and the *Vulcania,* 1,319, or a total of 8,029.

⚓ ⚓ ⚓

The *Seafarers Log* and the *Pilot,* published biweekly for their members by the Seafarers International Union and the National Maritime Union, respectively, are featuring half-page articles on shipboard safety. Highlighted with pictures and cartoons the messages are a welcome addition in the promotion of safety at sea.

⚓ ⚓ ⚓

Esso Shipping Co. has presented Certificates of Safety to four of their vessels for operating throughout 1957 without a lost-time personal injury accident. The ships are the SS *Esso Bethlehem,* SS *Esso Binghampton,* SS *Esso New York,* and SS *Esso Manhattan.* In addition to framed certificates, each ship received a "Green Cross for Safety" pennant to be displayed in port during 1958.

⚓ ⚓ ⚓

The SS *Aimee Lykes* received the first place award in the Lykes Fleet Safety Contest for C-2/Victory vessels for operating throughout 1957 with no lost-time injuries. Captain Paul Butler and Chief Engineer A. Losasso of the *Aimee Lykes* accepted the presentation for all the vessel's personnel.

⚓ ⚓ ⚓

Until September 30, boat owners may apply to the Federal and 46 of the 48 State governments for refund

STATES LINE HONORS SAFETY LEADERS

IN RECOGNITION of their successful accident prevention efforts during 1957, the officers and crew of the SS *Wyoming* were presented a Fleet Safety Award by States Line officials in ceremonies recently held in Portland, Oreg. Pictured right to left are: Captain W. E. Pierson, States Line Port Captain; P. C. Arms, Jr., Third Mate; Captain J. J. K. Tellert of the *Wyoming*; Donald C. Kinser, First Assistant Engineer; Marvin Grauel, Chief Engineer; Andrew Abramenkoff, Chief Mate; G. Adams, Boatswain; G. Wulzen, Deck Maintenance Man; W. Gieelhouse, Deck Maintenance Man; C. Newman, AB; C. Hawk, Deck Maintenance Man; B. Moore, AB; A. Smidt, Second Mate; W. Cruchon, Radio Officer; and J. Justice, OS.

CAPTAIN A. P. DANIELSEN of the SS *Pacific Transport* smilingly accepts, on behalf of his ship and crew, the annual award for the best safety record for C–3 and Mariner class vessels in the States Line fleet from Captain Joseph Dickover, vice president of the company. Others present at the ceremony are, left to right: Commander Leonard C. Walen, representing the Coast Guard's Marine Inspection Office, San Francisco; Robert M. Kluzek, Accident Prevention Bureau of Pacific Maritime Association; and Captain Gilbert Vanderwater of the P. & I. Agency.

of taxes collected on gasoline purchased for use on boats. Refunds are for the period July 1, 1957, through June 30, 1958.

⚓ ⚓ ⚓

Maritime leaders from all parts of the world are expected to take part in the 32d Annual Propeller Club Convention and Merchant Marine Conference to be held in San Francisco October 15–17, 1958. This will be the first time in more than a decade the convention has been held on the west coast, it was announced.

⚓ ⚓ ⚓

Another date of importance to the marine industry is the 46th Annual Safety Congress to be held in Chicago, Ill., October 20–23, 1958. The Marine Section meetings will feature talks from representatives of industry and government.

⚓ ⚓ ⚓

Since 1899, 79 percent of the total number of ships abandoned, foundered, or missing were below 300 feet in length, according to a report in a current issue of the *Marine Journal*.

⚓ ⚓ ⚓

Customs figures for the San Francisco bay area show 2,622 ships engaged in foreign trade entered the port during the fiscal year ending July 1, 1958, and 2,673 cleared. Of this number, 962 American flag ships entered, and 1,005 cleared.

⚓ ⚓ ⚓

In recognition of 3,500 "flash calls" made in the last 4 years to Air Force filter centers by ship's crews, the Lake Carriers' Association has been presented a Ground Observer Corps "skywatch" citation. Crew members were briefed by the Air Force, and the calls initiated during this period were recognized as "converting the Great Lakes into one which provided important visual surveillance in the mission of air defense."

⚓ ⚓ ⚓

Alexander T. Wood, president of the Wilson Marine Transit Co., was honored at Sault Ste. Marie by being named "Great Lakes Man of the Year" for 1957, it was announced in the Lake Carriers' *Bulletin*. Mr. Wood was nominated by 24 Great Lakes area marine writers in recognition of his "outstanding contributions to the marine industry."

⚓ ⚓ ⚓

President Eisenhower has signed a bill authorizing the construction of a $78 million luxury liner for trans-Pacific operation by American President Lines. The ship, to be named the SS *President Washington*, is expected to be over 900 feet in length, capable of carrying 1,464 passengers, and to cruise at 26 knots.

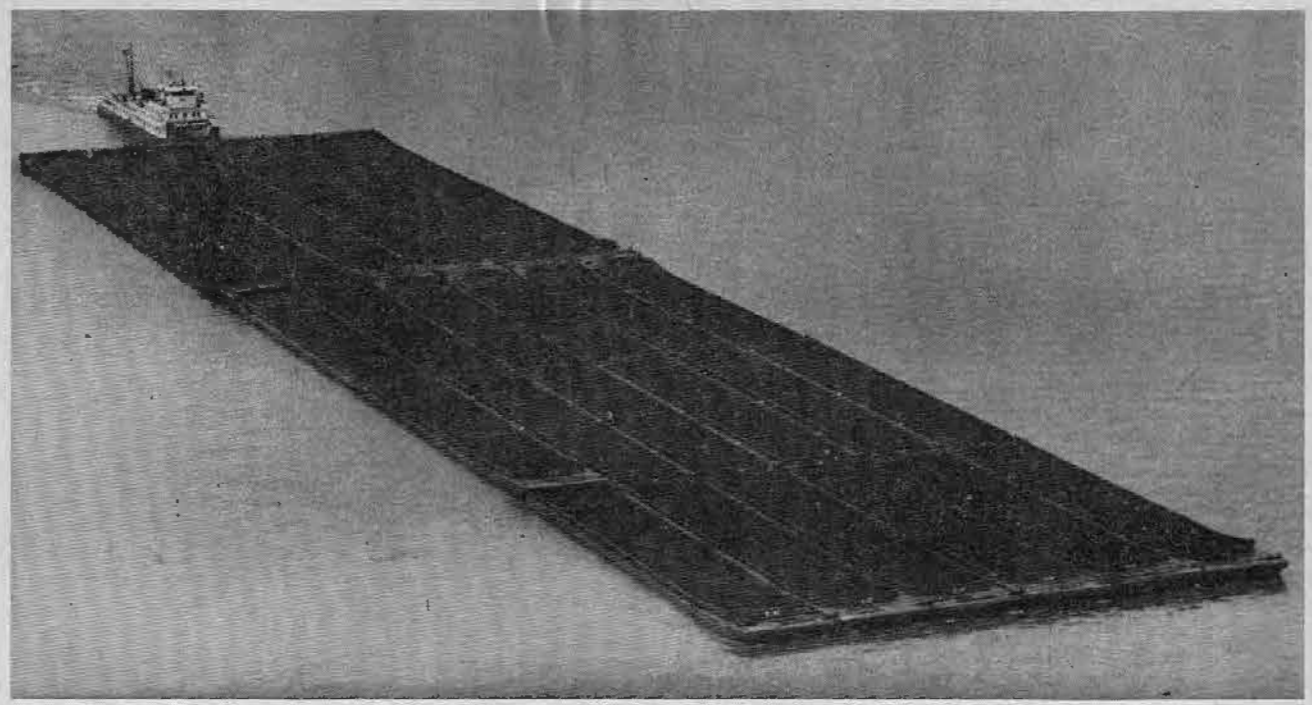
⚓ ⚓ ⚓

Merchant Marine service ribbons may be obtained by qualified merchant seamen from Harry Sadow, 75 Church Street, New York 7, New York, it was announced by Clarence G. Morse, Maritime Administrator, U. S. Department of Commerce.

Decorations include the Korean Service Bar, Atlantic, Pacific, and Mediterranean-Middle East War Zone Bars of World War II, Combat, Defense Bar, and Victory Medal Bar. Cost of each bar is 30¢, which includes postage.

Sale of any merchant marine decoration without presentation of an Authorization Card is prohibited by law. Cards may be obtained from the Seamen Services Section, Maritime Administration, Washington 25, D. C., on presentation of information on name of seaman, vessel, period of service, and area served.

TOWBOATS AND TUGBOATS



ALMOST FIFTY THOUSAND TONS of coal in 30 barges is being moved on the Ohio River by the MV *Philip Sporn*. High water conditions made this enormous load possible. Photo courtesy *American Commercial Barge Line* Co.

PLYING THE Nation's waterways with voluminous loads of cargo in barges strung ahead in an unbroken, tightly knit line are the powerful modern-day towboats that have helped transform the inland water carrier industry into a major economic factor in the movement of the country's goods.

With her sister tugboat, which is put to good advantage in open water areas where her hull characteristics are required, the towing vessel and barge are inseparable teammates in the transportation of waterborne commerce.

Made up together in tows, the towboat and barge serve a portion of the transportation needs of steel mills, blast furnaces, cement factories, oil refineries, chemical plants, grain growers and elevators, coal mines, aluminum mills, electric power plants, automobile manufacturers, sulphur mines, paper mills along the 29,000 miles of navigable waterways in the United States.

Because of their great carrying capacity, the tows with their bargeloads of commodities represent the "big load" in the movement of commerce within the United States. Captains of tows on many of the rivers can often count 20 or more barges in their manifest, representing a shipment of from 20,000 to 35,000 tons of cargo.

This is the fourth of a series of articles on our inland waterways prepared especially for the Proceedings by the American Waterways Operators, Inc., a nonprofit trade association of domestic carriers and operators on the inland waters, intracoastal canals and waterways, bays, sounds and harbors of the United States.

TWO METHODS

Towing on the inland waterways is accomplished in two distinct fashions. On most of the inland waterways system, which has been harnessed by vast engineering projects and provides relatively stable waters, the towboat is used in what is commonly referred to as the push method of towing.

In this method, rather than pull or tow as the name of the towboat suggests, the vessel actually pushes the barges ahead.

Wave and tidal actions on some portions of the navigable waterways particularly sections of the Gulf Intracoastal Waterway, the Hudson and Delaware, as well as some reaches of open water traversed by barges, require the pull method of towing in which the tugboat tows barges behind on a hawser.

The services of the tugboat or harbor workhorse which normally is seen nosing ocean liners in and out of harbor berths, are used in towing operations only under specialized conditions, usually dictated by the roughness of the water or impracticability of moving large tows.

In push towing, the barges are tied together by steel cables or ropes so as to form a single rigid unit, with the towboat behind to supply the propulsion.

GOOD CONTROL

Navigation on the rivers calls for a maximum of control best afforded by the push method which allows the rigid tow to flank the winding river turns under control of the rudder system of the modern towboats. The barges are tightly laced to the large towing knees of the towboat in a manner which locks the entire tow into a single unit, giving greater control and safety in handling.

The rigid unit also allows for greater speed because the single unit has less resistance to the water than is encountered in pull towing where the barges are spaced out on a hawser.

This greater efficiency of operation results in lower fuel expenses.

In addition, the push method with its greater control factor can better offset the effects of wind and current on the movement of the tow, and permits the use of a larger number of barges in a single movement.

Another type of push method is used to move small groups of barges. This is the "on the hip" method in which the barges are pushed alongside a towboat or a tugboat. This method, offering the same operating control as towing ahead, is used on shorter run operations and in crowded river or coastal areas where it is more advantageous to use a smaller tow. Alongside pushing cannot be effectively used for larger tows, since the control of the tugboat diminishes with the length of the string of barges.

For pull towing, the tugboats have a towing bitt which is located ahead of the steering rudder so as to provide steering control while the tug pulls the barges on a hawser.

Although each type is classified as a towing vessel, the towboat and tugboat are vastly different. A tug has a V bottom, as against the towboat's flat bottom hull. Tugs require sealed watertight doors and port holes to prevent entry of water, while the towboat has conventional doors and windows.

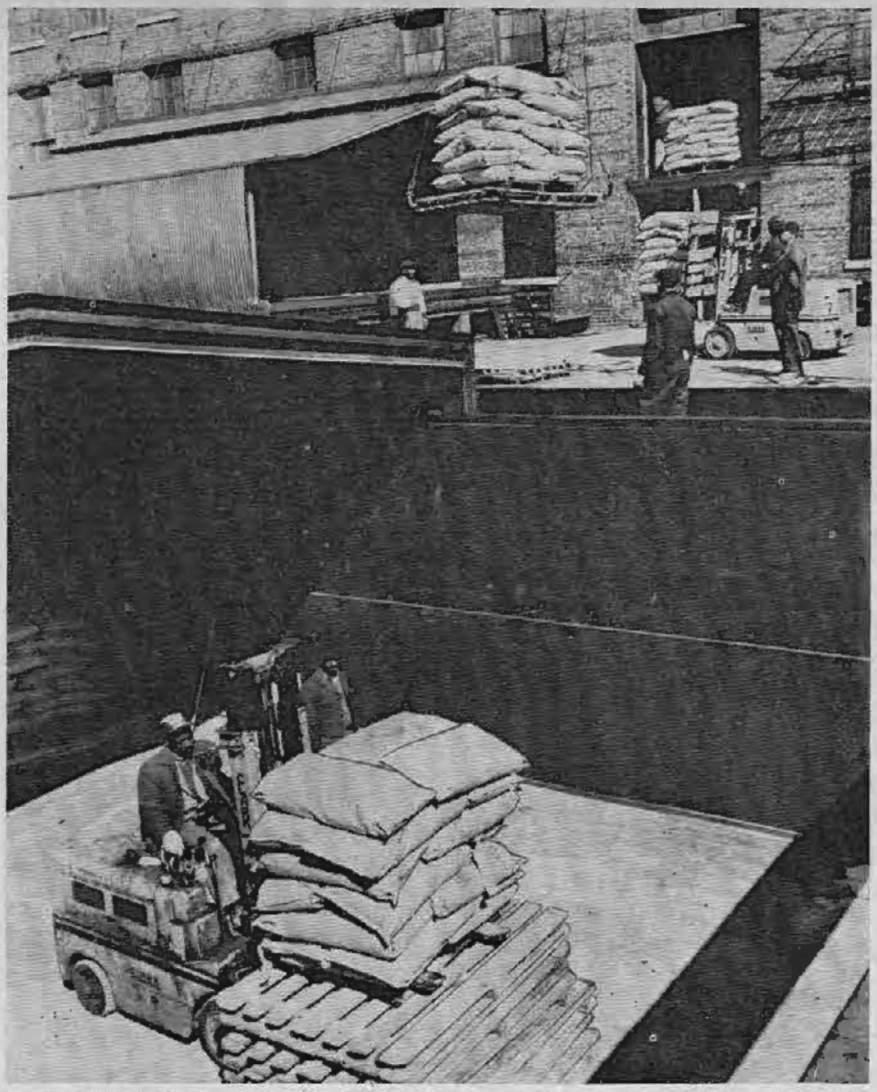
In effect, the tug in coastwise service is an ocean vessel, being used almost extensively in open water service, while the towboat is used exclusively on the rivers and other protected inland waterways.

INCREASED TRAFFIC

With the phenomenal increase in barge traffic over recent years, reaching a 110 billion ton-miles in 1956, have come rapid advances in terminal operations.

One hundred years ago, when the old sternwheel packet boats dominated river traffic, a river terminal was any spot at the bank where boats could land. By dropping a gangplank, the cargo was moved from the packets to the shore on the backs of roustabouts. Today's modern terminal facilities, which number close to 2,000 along the navigable waterways, were unknown in those days when nearly every town on the river was a port.

The terminal docks, with their cranes and conveyors, have mechanized much of the terminal activities on the waterways. The modern river, rail and truck terminal serves as the connection for the three modes of transportation, handling cargo in an economical manner by transferring it to and from barges, or indirectly through a transit shed for the assembling of cargo, temporary storage or packaging.



A GENERAL CARGO barge is unloaded at a Chicago terminal. The sugar being handled in this scene is just one of many carried by inland water transportation. Photo courtesy *North Pier Terminal Co.*

The extensive equipment used in terminal operations includes many types of machinery for the movement of cargo by crane, fork trucks of various sizes to handle the various loads, clam shells and hoppers for bulk handling, conveyors, 2- and 4-wheel trucks, power "mules" to move trucks in tandem style, stevedore pallets, high lifts and a wide diversity of other types of gear.

Many industries that have moved to waterside locations to take advantage of low cost barge transportation have river terminals tailored to meet their own needs, such as the "controlled velocity" suction bell mouth pumping systems for petroleum products, the gigantic continuous revolving conveyor belts with buckets for loading and unloading coal and other commodities, and the specially designed bulk cement barges with ramps that allow high-lift trucks to run on from the dock to load and unload.

A modern terminal facility can unload 900 tons of coal in an hour, enough to fill almost 20 railroad freight cars. Grain elevators can load barges at a rate of 15,000 to 20,000 bushels an hour through their enormous spouts, and unloading by suction is almost as fast.

The terminal facility warehouses, bags, sorts, shifts and distributes bargeloads of freight. Working together, the terminal operator and the barge operator must find the least expensive and most satisfactory method for moving commodities.

(Continued on page 172)

MEREDITH VICTORY CREW HONORED BY KOREANS

FOR THEIR part in the December 1950 evacuation of Hungnam, Korea, the officers and crew of the SS *Meredith Victory* have been presented a Korean Presidential Unit Citation from Syngman Rhee.

Operated by Moore-McCormack Lines, the ship carried 14,000 persons from the battered port of Hungnam to the safety of Pusan in their vessel fitted to carry 12 persons in addition to the crew.

In 1955 the Republic of Korea decorated Capt. Leonard P. LaRue of the *Meredith Victory* on the fifth anniversary to the day and hour of this rescue feat. Earlier in that year Captain LaRue became Brother Marinus of the Roman Catholic Benedictine Missionaries at Newton, N. J.

The Presidential Citation issued on May 20, 1958, was accepted by James R. Lunney, staff officer on the *Meredith Victory* during the evacuation on behalf of the vessel and its personnel.

The ship departed Norfolk in July 1950, and after completion of loading in Oakland, Calif., proceeded for Inchon, Korea. One of the first merchant ships to enter Inchon harbor, she discharged her cargo under the protective guns of the naval forces present. After departing port, the ship accepted the surrender of 13 North Korean soldiers adrift in an open boat, and returned them to Yokohama—the first prisoners of war from the invasion.

It was after several shuttle trips between Japanese ports and Korea that the *Meredith Victory* was called upon to assist in the evacuation.

Following is a list of the crew of the *Meredith Victory* at the time of the evacuation in addition to Captain LaRue and Mr. Lunney:

● **DECK DEPARTMENT**

Dino S. Savastio
Albert W. Golembeski
Alvar G. Franzon
Henry J. B. Smith
Nathaniel T. Green, Jr.
Elmer B. Osmund
William R. Jarrett
Patrick H. McDonald
Charles L. Harris
Kenneth E. Jones
Noel R. Wilson
Lonnie G. Hunter
Richard L. Coley
Leon A. Katrobos
Ismmal B. Tang

● **ENGINE DEPARTMENT**

John P. Brady
George E. Hirsimaki
Harding H. Petersen
Nile H. Noble
James A. Kelsey
Alfred W. Kaufhold
Merl Smith
Morall B. Harper
Sidney E. Deel
Charles C. Crockett
Steve Xenos
Lawrence Hamaker, Jr.
Joseph A. Horton
Louis A. Sullivan
Lee Green
Vernice Newsome
Andres Diaz
Joseph Blessett

● **STEWARDS DEPARTMENT**

Major M. Fuller
Herbert W. Lynch
Wong T. Win
Willie Newell
Adrian L. McGregor
Johnnie Pritchard
Edgar L. Hardon
Robert H. Clarke
Leon L. Hayes, Jr.
Ernest Wingrove
Ira D. Murphy
Mack Perkins

SOME OF THE 14,000 persons packed aboard the *Meredith Victory* are shown in this photograph taken from the bridge deck looking aft. Photo Courtesy *Moore-McCormack Lines, Inc.*

SYNGMAN RHEE
PRESIDENT OF THE REPUBLIC OF KOREA

(Translation) 20 May 1958

PRESIDENTIAL UNIT CITATION

The President of the Republic of Korea takes pleasure in citing the Officers and Crew of the steamship *Meredith Victory* who participated in the evacuation of Hungnam, Korea, in December of 1950.

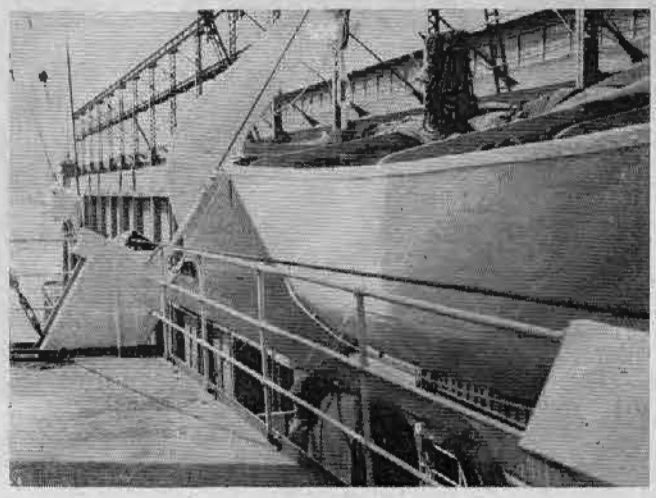
The *Meredith Victory* entered the port of Hungnam on the evening of 22 December 1950 where thousands of civilians waited by the waterfront, the last avenue of escape from the threat of annihilation by invading enemy forces. Answering an appeal from the United Nations Forces, then under great pressure from overwhelming communist forces, the Officers and Crew of the *Meredith Victory* spared no effort in accepting on board their 7,636-ton cargo-freighter 14,000 men, women and children and transporting them down the coast to safety.

The arrival of the *Meredith Victory* in Pusan after a 3-day voyage through dangerous waters was a memorable occasion for all who participated in this humanitarian mission, and is remembered by the people of Korea as an inspiring example of Christian faith in action.

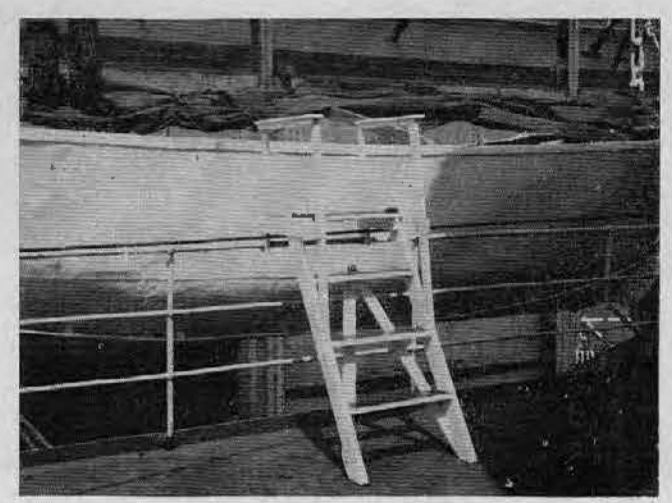
By this citation the Officers and Crew of the *Meredith Victory* who participated in the evacuation of Hungnam during the period 22 December to 25 December 1950 are entitled to wear the Presidential Unit Citation Ribbon.

(Signed) SYNGMAN RHEE

SAFETY GIMMICKS AND GADGETS



BEFORE . . .



. . . AND AFTER

THE *Proceedings* is indebted to the Grace Line *Safety Bulletin* for a "do it yourself" solution to a difficult problem of lifeboat access on the SS *Santa Cristina*.

The picture at the top shows a not uncommon view of a lifeboat swung in gravity davits. To enter the boat in this position it was necessary to climb the handrails, and step over the wire fall. The picture at the bottom demonstrates the remedy.

The sturdily constructed set of steps are slotted where they fit in the top handrail and held in place with a rotating bar. The steps use treads and slip-resistant paint as a further safety measure.

While this rig may not work on your ship, it is an excellent example of a safety gadget for a specific job. We join Grace Line in requesting that you let us know about things aboard ship that can be passed along to increase shipboard safety.

Don't keep your good ideas to yourself, let others profit by them!

Photos courtesy *Grace Line*.

MERCHANT MARINE STATISTICS

There were 939 vessels of 1,000 gross tons and over in the active oceangoing United States merchant fleet on July 1, 1958, according to the Maritime Administration. This was two more than the number active on June 1, 1958.

There were 31 Government-owned and 908 privately owned ships in active service. These figures did not include privately owned vessels temporarily inactive, or Government-owned vessels employed in loading grain for storage. They also exclude 31 vessels in the custody of the Departments of Defense, State, and Interior.

There was an increase of three active and a decrease of three inactive vessels in the privately owned fleet. One new combination passenger-cargo ship, the *Santa Rosa*, went into operation, and one tanker, the *Tascalusa*, was sold foreign. This left the total privately owned fleet at 1,000 ships.

Of the 92 privately owned inactive vessels, 25 dry cargo ships and 46 tankers were laid up for lack of employment, 4 less than on June 1. Most of the others were undergoing repair or conversion.

The Maritime Administration's active fleet decreased by one, while its inactive fleet increased by one. Three freighters, *Albert A. Robinson*, *Nancy Hanks*, and *Miguel Hidalgo*, were sold for scrap. Five transports owned by the Navy were turned over to the Administration. One Navy ship in fleet custody was turned over to the Navy and one military type vessel was transferred to the Army. This left the Government fleet unchanged at a total of 2,119. The total merchant fleet, active and inactive, was unchanged at 3,119 on July 1, 1958.

No new contracts were placed. One new combination passenger-cargo ship, the *Santa Rosa*, was delivered; one new tanker was delivered for foreign flag operation; and a converted tanker was delivered. One 106,000-deadweight-ton tanker was deferred. The total of large merchant ships on order or under construction in United States shipyards dropped by four vessels to 100.

Seafaring jobs on active United States-flag ships of 1,000 gross tons and over, excluding civilian seamen manning Military Sea Transportation Service ships were 51,430. Prospective officers in training in Federal and State nautical schools numbered 1,704.

nautical queries

Q. If a ship's radio direction finder is fitted with a quadrantal error compensator, will it be affected by changes made in the set or its surroundings?

A. Many radio direction finders are "compensated" and no calibration chart or curve is used. Attention is invited to the fact that such compensation is just as vulnerable as the calibration data to changes made in the set or its surroundings.

Q. Why is it desirable that a ship's radio direction finder set be capable of receiving signals between 275 and 515 kilocycles?

A. It is desirable that a ship's radio direction finder be capable of receiving signals between 275 and 515 kilocycles in order to permit the reception of radio beacon signals (285–325 kilocycles) and to obtain bearings when necessary on vessels in distress using the international distress frequency (500 kilocycles).

Q. How would you obtain a radio bearing, when the minimum, or null, is not well defined?

A. When the minimum, or null, is not well defined, a fairly accurate bearing may be obtained by swinging the loop to each side, until the signal becomes just audible, and taking the mean of the reading in these two positions.

Q. Describe the effect of electrical conductors near the radio direction finder.

A. The presence of electrical conductors near the direction finder creates errors in the indication of the true direction of the incoming signal in much the same manner as the presence of iron near a magnetic compass creates errors in the indications of the compass. The amount of this error (called the deviation) must be known and applied to the indicated bearing in order to obtain the true bearing of the radio signal. It should be noted that this error, in a direction finder installed aboard ship, depends upon the bearing relative to the ship's head, and is, therefore, different for each bearing. A deviation curve can be made for the radio direction finder similar to the one for the ship's compass.

Radio bearings are subject to certain errors due to a disturbing or refracting influence caused by the metal in a ship's structure, electrical currents, other antennas, etc. This is called quadrantal error, being maximum on relative bearings 45° and 135° on each side.

Q. (a) How is a radio direction finder on board ship calibrated for errors caused by electrical conductors nearby?

(b) How are bearing errors caused by nearby electrical conductors corrected on board ship?

A. (a) A radio direction finder is calibrated for errors caused by nearby electrical conductors by simultaneously observing radio and visual bearings of a radio beacon while on various headings. Antennas, davits, cranes, etc. should be in the normal position they would be when the vessel is at sea.

(b) Errors caused by nearby electrical conductors are corrected by using the calibration table made up from the observations taken according to answer (a) above; or on many types of direction finder by a cam which automatically corrects the indicator as it rotates in azimuth relative to the ship's head.

Q. What is observed altitude?

A. Observed altitude is corrected sextant altitude; angular distance of the center of a celestial body above the celestial horizon of an observer, measured along a vertical circle, through 90°. Occasionally called true altitude.

Q. *Given:*
Master gyro error 2° West
Variation 17° East
Required: The number of degrees right or left of the master gyro reading you would have to set a repeater's reading in order for it to give correct magnetic readings.

A. 19° to the right.

Q. *Given:*
Master gyro error 1° East
Variation 33° West
Required: The number of degrees right or left of the master gyro reading you would have to set a repeater's reading in order for it to give correct magnetic readings.

A. 34° to the left.

Q. Why is the visible diameter of the sun greater in the winter than in the summer?

A. The sun is closer to the earth in the winter than in the summer. This is caused by the elliptical orbit of the earth about the sun, with the sun at one of the focal points.

Q. How may the probability of encountering gales on an ocean passage for a given period of time be determined?

A. The probability of encountering gales on an ocean passage for a given period of time may be determined by referring to the Pilot Chart. An inset chart thereon shows the percentage of days that gale winds of force 8 or above usually occur during the period for the various areas covered by the chart.

Inasmuch as this is a statistical probability based on a long period of observations, suitable modifications may be adjudged on the basis of the current weather conditions.

Q. State two (2) reasons why tropical cyclones are divided into two semicircles, one considered dangerous and the other considered navigable.

A. Two reasons why tropical cyclones are divided into two semicircles, one considered dangerous and one considered navigable, are as follows:

1. In one semicircle (dangerous) the forward velocity of the storm adds to the velocity of the wind about the storm center; in the other semicircle (navigable) the forward velocity of the storm subtracts from the wind velocity about the storm center.

2. In one semicircle (dangerous) the direction of the wind and sea is such as to force the vessel towards the path of the storm center; in the other semicircle (navigable) the wind and sea force the vessel towards the rear of the storm.

Q. The maximum height of storm waves can be approximated by the formula:
$H=1.5\sqrt{F}$ where **H** is the height in feet and **F** is the fetch in nautical miles
Using this formula, determine the maximum height of storm waves that may be encountered when a gale is blowing from a direction in which the coastline is distant 400 miles.

A. 30 feet.

Q. What are the three factors that determine the height of a storm wave in the open sea?

A. 1. Wind force.
2. Duration of the wind.
3. The fetch.

Q. What is the Zone Time on a vessel in Zone plus 5 when the Greenwich time is 1800?

A. 1300.

SENSE ANTENNAS FOR RADIO DIRECTION FINDERS

The Coast Guard has been informed that on recent inspections of radio direction finding equipment by representatives of the Federal Communications Commission that sense antennas had been improperly maintained in a few instances and that deck officers, on one or more occasions, failed to understand their use.

The sense antenna is used to provide a means for resolving the 180 degrees ambiguity that may exist in a bearing obtained by use of a radio direction finder. In the usual circumstances of navigation at sea, the general direction of a radio beacon is known, so the ambiguity in bearing may not exist. Frequently, any doubt may be resolved by noting the manner in which the bearing changes. However, situations may arise when proper use of the sense antenna can save lives.

One example could well be the location of an emergency transmitter of a lifeboat or airplane in distress. Failure to use the directional capability of the direction finder sense antenna properly could result in your ship heading directly away rather than directly toward the distressed craft.

The necessity for and proper use of the sense antenna may be better understood if the direction finder user understands the basic theory of the direction finder loop. When a loop antenna is rotated, it will produce two nulls (minimum-signal-level points) of the signal from a distant transmitter. These nulls are approximately 180 degrees apart and occur when the plane of the loop is perpendicular to the direction from which the signal is arriving. Since the direction finder pointer cannot identify the actual bearing of the transmitter (true null) from the reciprocal bearing (false null), a sense of direction must be introduced. This is accomplished by combining the loop signal with the signal from a nondirectional sense antenna. Step by step procedure for determining the true null of a radio transmission should be obtained from the operating manual furnished with the specific equipment.

It should be understood that sense antenna installations are usually "hand-tailored" for each type of vessel since its location with respect to the loop antenna, length, and relationship to the ship's superstructure is important. Once the sense antenna has been installed by qualified personnel, its length and location must not be changed. To do so probably will affect the quality of the null, that is, make it too broad or too sharp depending on whether the sense antenna has been shortened or made longer. In some cases, tampering with the antenna may result in complete loss of its ability to provide sense information.

It is recommended that users of the direction finder take practice bearings on signals whose "sense" of direction is already known so that familiarity with the direction finder is acquired.

RADIO TELEPHONES

Operators of certain vessels carrying over six passengers for hire are reminded that there are requirements of the Federal Communications Commission to maintain specific radiotelephone equipment.

The 1956 law, enacted by Congress, became effective March 1, 1957 and states:

> "* * * United States vessels carrying more than six passengers for hire which are navigated in the open sea or on any tidewater within the jurisdiction of the United States adjacent or contiguous to the open sea be equipped with radiotelephone installations meeting requirements of the FCC * * *."

A charter fishing boat was found operating off Florida with more than six passengers without the required radio protection. The Government imposed a $600 fine for the violation. When the money was not forthcoming, the Federal Court in Tampa ordered the vessel seized for sale to satisfy the judgment. The Government later accepted payment of $450 by the craft's owner on the latter's written agreement to install the radio equipment.

In addition to the prescribed equipment for vessels compulsorily fitted, the FCC pointed out that at least one operator must hold a Radiotelephone Third Class Operator Permit. The usual restricted radiotelephone operator permit is not acceptable under the Act.

Full information on periodic inspection and certification, listening watch, transmitter power and frequency requirements, and method of determining transmitter power may be obtained from the Federal Communications Commission, Washington 25, D. C., or any of the following Commission field offices:

ALABAMA
419 U. S. Courthouse and Customhouse,
Mobile 10, Ala.

ALASKA
53 U. S. P. O. and Courthouse Bldg.,
P. O. Box 644,
Anchorage, Alaska.
6 Shattuck Bldg.,
P. O. Box 1421,
Juneau, Alaska.

CALIFORNIA
15–C U. S. Customhouse,
Union and F Streets,
San Diego 1, Calif.
326 U. S. Post Office and Courthouse Bldg.,
San Pedro, Calif.
323–A Customhouse,
555 Battery Street,
San Francisco 26, Calif.

DISTRICT OF COLUMBIA
718 Jackson Place NW.,
Washington 25, D. C.

FLORIDA
312 Federal Building,
P. O. Box 150,
Miami 1, Fla.
409 Post Office Building,
Tampa 2, Fla.

GEORGIA
214 New Post Office Building,
P. O. Box 77,
Savannah, Ga.

HAWAII
502 Federal Building,
Honolulu 1, T. H.

LOUISIANA
608 Federal Office Building,
600 South Street,
New Orleans 12, La.

MARYLAND
400 McCawley Building,
400 E. Lombard Street,
Baltimore 2, Md.

MASSACHUSETTS
1600 Customhouse,
Boston 9, Mass.

NEW YORK
748 Federal Building,
641 Washington Street,
New York 14, N. Y.

OREGON
507 New U. S. Courthouse,
620 SW. Main Street,
Portland 5, Oreg.

PENNSYLVANIA
1005 New U. S. Customhouse,
Philadelphia 6, Pa.

PUERTO RICO
322 Federal Building,
P. O. Box 2987,
San Juan 13, P. R.

TEXAS
324 U. S. Appraisers Building,
7300 Wingate Street,
Houston 11, Tex.
301 Post Office Building,
P. O. Box 1527,
300 Willow Street,
Beaumont, Tex.

VIRGINIA
402 Federal Building,
Norfolk 10, Va.

WASHINGTON
802 Federal Office Building,
1st Avenue and Marion,
Seattle 4, Wash.

PROTECT YOUR EYES

Of all our God-given gifts, none is more precious than eyesight!

If you don't think so, just cover one eye for a moment and see how distorted things are. Better yet, ask a man who has lost the sight of one or both of his eyes.

Safety glasses are a must aboard ship for a myriad of jobs, and the picture above shows a saving that cannot be estimated. In this case, the man was using a center punch and a fragment struck his right lens square in the center. There is no doubt that if he had not been wearing safety glasses, he would have lost the sight of his right eye.

Our advice: Post this picture where seamen who complain that glasses are uncomfortable, hard to work with, or are too hot to wear can see their immediate value.

SMALL SIZED CHARTS

The Coast and Geodetic Survey has started a research and development program for the design and ultimate production of a series of small sized charts, and the advice and suggestions of mariners have been requested by Rear Admiral H. Arnold Karo, Director.

While the specially designed nautical charts are being considered to meet the particular needs encountered in small boat navigation, charts of a reduced size are recognized as being useful aboard larger vessels, it was pointed out.

SPECIAL TROPICAL STORM REPORTS

Any ship encountering tropical storm or hurricane conditions that may affect North American shipping waters during the months June through November inclusive is requested to report them to the U. S. Weather Bureau. Reports of storm conditions met between 3° N. to 35° N. and west of 35° W. in the North Atlantic should be addressed to "Observer Washington" while those from waters west of Central America and Mexico between 5° N. and 35° N. in the North Pacific should be sent to "Observer San Francisco." Messages may be sent via a U. S. Government or commercial shore radio station. Any toll charges on the messages will be paid by the Weather Bureau.

Only reports of tropical storm conditions should be reported by radio unless the ship has been authorized by the Weather Bureau to furnish weather reports daily. Fuller instructions are given in "Notice to Mariners," No. 21/58 (2407), May 24, 1958. See also "International Convention for Safety of Life at Sea," Chapter V. From the *Mariners Weather Log.*

SCOTCH & SKIVIES

"Skivies"—sailor slang for underwear—comes to us from a term used by the early Scots. They called the tight-fitting trousers they wore next to their skins Skivaclothes, meaning "crazy cloths." Adopted by seamen and shortened to "skivies," it has come to be applied to any undergarment.

GROG

A glass of grog is as familiar as the Navy and the way the drink got its name is an example of the sense of humor sailors have the world over.

Back in 1745 the English admiral, Edward Vernon, decided the straight rum his men were drinking was a little too potent. He ordered that all such shipboard liquor be diluted with water.

The result was, to say the least, unpleasing to the sailors. They christened the watery stuff "grog" in ridicule of the Admiral, who was known as "old Grog" because of the grogham breeches he always wore.

Great Lakes and Inland Waterways.

DO YOU NEED GLOVES?

For some shipboard jobs gloves are a useful tool. For others, they are dangerous.

The Coast Guard regularly receives reports of seamen suffering injuries ranging from bad burns to amputations because their hands inadvertedly have been pulled into moving machinery or been caught in a turn of wire or rope while wearing gloves.

One inspector related that aboard a large passenger ship members of the stewards department were wearing work gloves to keep their hands clean during drills. Now, cleanliness is a fine thing, but to use work gloves for this purpose seems questionable. Make sure you need the protection gloves afford before you put them on. If you don't need them, don't wear 'em!

A graphic case in point is the picture above. This chewed up remnant was photographed after its ill-advised use around moving machinery.

FIRST RATE

In the days of sailing ships, men-of-war carrying more than 100 guns were called "first rates." Those in the "second rate" had 90 or more, "third rates" boasted about 74, and "fourth rates" usually had 56. Though the ships have vanished, the expressions, their nautical meanings forgotten, live on in our language.

ACCIDENTS IN BRIEF

Here is a condensation of some accidents reported to Coast Guard Headquarters during the past month. A capsule glimpse into the cause * * * and effect. In each case the victim was incapacitated for at least 72 hours.

CAUSE	EFFECT
Chipping deck without goggles	Rust imbedded in eye.

Slipped on a banana. **Six days hospitalization with sprained ankle.**

Too close to furnace peep hole	1st and 2d degree burns on face, both hands.
Stepped over guard rail	Fell 10 feet into open barge—broken right hip.
Painting from bench	Fractured right arm.
Gantline breaks	25-foot fall to deck, hospitalized.
Wrong size wrench	Fractured hand.

Kicking down nail sticking up. **Nail pierced foot.**

Open floor plates	Broken leg.
Walked off cargo hatch	Concussion to head.
Balanced on piping	Injured in fall to deck below.
Moving machinery	Left hand torn off.
Empty bucket dropped from deck above	Injured head to man below.

Broken glass in galley sink. **14 days recovering from glass sliver in hand.**

INSTRUCTION OF GREEN LOOKOUTS

The posting of a lookout at night or in low visibility is a basic safety precaution which no master neglects. But the mere stationing of a man in the bow, or upon the bridge or elsewhere if the bow station is unsafe, is not sufficient. It is the responsibility of the officer in charge of the ship to assure himself that the lookout is, in fact, performing his duties vigilantly throughout his watch. Undoubtedly, in many instances a watch officer in a high, protected bridge has better visibility than a lookout exposed to the weather on an open forecastle deck. But this should not allow the officer to disregard the lookout or to tolerate negligence in making reports, even though the reported object may already have been noted by the bridge.

An example of the result of such tolerance was shown in a collision occurring between two steamers on a dark night and in clear weather. The prescribed complement of one of these vessels was such that an ordinary seaman was standing lookout watch. Unfortunately, it was this seaman's first trip to sea. The two ships came together through unskillful handling on both sides. The part played by the lookout had little or no bearing on the actual collision since the lights of both vessels had been clearly visible for some time. Nevertheless, the lookout had made no report and, upon examination, testified that he did not know what reports to make or how to make them.

Although the stationing of an ordinary seaman at the lookout is lawful, and although there has to be a first trip for every man going to sea, the vessel was held at fault because the officer of the watch, having received no reports from the lookout, made no effort to investigate the reason and thereby learn that this lookout was ignorant of his duties.

No watch officer should take for granted his lookout's performance. In all cases lookouts should be specifically designated as such and, if necessary, instructed in their duties. Any failure on their part to function efficiently should be immediately looked into and corrected.

CHANGES IN PILOT RULES FOR BARGES AND TOWING VESSELS

The statutory and regulatory requirements governing the lights for towing vessels and barges which operate under the Pilot Rules for Inland Waters and Pilot Rules for the Western Rivers have been revised.

These changes apply in particular with respect to the Gulf Intracoastal Waterway and the Western Rivers.

The changes in these Pilot Rules were developed by vessel operators working through the Western Rivers Panel of the Merchant Marine Council and are intended to eliminate confusion and possible hazards to vessels going from an area where the Inland Rules are in effect to an area coming under the Western Rivers regulations and vice versa.

The changes in the law for towing vessel lights became effective on August 14, 1958.

The changes in regulations for barge lights authorized the new lights to be carried immediately and make these lights mandatory on and after January 1, 1959.

In order to reduce confusion and misunderstanding the Coast Guard urges those concerned with these changes to pass the information on to other mariners.

AN ACT

To amend the Act of June 7, 1897, as amended, and section 4233 of the Revised Statutes, as amended, with respect to lights for vessels towing or being overtaken.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That article 3 of section 1 of the Act of June 7, 1897, as amended (30 Stat. 97, as amended; U. S. C., 1952 edition, title 33, sec. 173), is amended to read as follows:

"Article 3. (a) A steam vessel when towing another vessel or vessels alongside or by pushing ahead shall, in addition to her side lights, carry two bright white lights in a vertical line, one over the other, not less than three feet apart, and when towing one or more vessels astern, regardless of the length of the tow, shall carry an additional bright white light three feet above or below such lights. Each of these lights shall be of the same construction and character, and shall be carried in the same position as the white light mentioned in article 2 (a) or the after range light mentioned in article 2 (f).

"(b) A steam vessel carrying towing lights the same as the white light mentioned in article 2 (a), when pushing another vessel or vessels ahead, shall also carry at or near the stern two bright amber lights in a vertical line, one over the other, not less than three feet apart; each of these lights shall be so constructed as to show an unbroken light over an arc of the horizon of twelve points of the compass, so fixed as to show the light six points from right aft on each side of the vessel, and of such a character as to be visible at a distance of at least two miles. A steam vessel carrying towing lights the same as the white light mentioned in article 2 (a) may also carry, irrespective of the position of the tow, the after range light mentioned in article 2 (f); however, if the after range light is carried by such a vessel when pushing another vessel or vessels ahead, the amber lights shall be carried in a vertical line with and at least three feet lower than the after range light. A steam vessel carrying towing lights the same as the white light mentioned in article 2 (a), when towing one or more vessels astern, may also carry, in lieu of the stern light specified in article 10, a small white light abaft the funnel or aftermast for the tow to steer by, but such light shall not be visible forward of the beam."

Section 2. Article 10 of section 1 of the Act of June 7, 1897, as amended (30 Stat. 98; U. S. C., 1952 edition, title 33, sec. 179), is amended to read as follows:

"Article 10 (a) A vessel when underway, if not otherwise required by these rules to carry one or more lights visible from aft, shall carry at her stern a white light, so constructed that it shall show an unbroken light over an arc of the horizon of twelve points of the compass, so fixed as to show the light six points from right aft on each side of the vessel, and of such a character as to be visible at a distance of at least two miles. Such light shall be carried as nearly as practicable on the same level as the side lights.

"(b) In a small vessel, if it is not possible on account of bad weather or other sufficient cause for this light to be fixed, an electric torch or a lighted lantern shall be kept at hand ready for use and shall, on the approach of an overtaking vessel, be shown in sufficient time to prevent collision."

Section 3. Section (d) of Rule Numbered 3 of section 4233 of the Revised Statutes of the United States, as amended (U. S. C., 1952 edition, title 33, sec. 312), is amended to read as follows:

"(d) At or near the stern, where they can best be seen, two amber lights in a vertical line, one over the other, not less than three feet apart, of such a character as to be visible from aft for a distance of at least two miles, and so screened as not to be visible forward of the beam."

Section 4. Rule Numbered 10 of section 4233 of the Revised Statutes of the United States, as amended (U. S. C., 1952 edition, title 33, sec. 319), is amended to read as follows:

"Rule Numbered 10. (a) A vessel when under way, if not otherwise required by these rules to carry one or more lights visible from aft, shall carry at her stern a white light, so constructed that it shall show an unbroken light over an arc of the horizon of twelve points of the compass, so fixed as to show the light six points from right aft on each side of the vessel, and of such a character as to be visible at a distance of at least two miles. Such light shall be carried as nearly as practicable on the same level as the side lights.

"(b) In a small vessel, if it is not possible on account of bad weather or other sufficient cause for this light to be fixed, an electric torch or a lighted lantern shall be kept at hand ready for use and shall, on the approach of an overtaking vessel, be shown in sufficient time to prevent collision."

SUBCHAPTER D—NAVIGATION REQUIREMENTS FOR CERTAIN INLAND WATERS

PART 80—PILOT RULES FOR INLAND WATERS

LIGHTS FOR CERTAIN CLASSES OF VESSELS

Section 80.16a is amended to read as follows:

§ 80.16a Lights for barges, canal boats, scows and other nondescript vessels on certain inland waters on the Gulf Coast and the Gulf Intracoastal Waterway. (a) On the Gulf Intracoastal Waterway and on other inland waters connected therewith or with the Gulf of Mexico from the Rio Grande, Texas, to Cape Sable (East Cape), Florida, barges, canal boats, scows, and other vessels of nondescript type not otherwise provided for, when being towed by steam vessels shall carry lights as set forth in this section.

(b) When one or more barges, canal boats, scows, or other vessels of nondescript type not otherwise provided for, are being towed by pushing ahead of a steam vessel, such tow shall be lighted by an amber light at the extreme forward end of the tow, so placed as to be as nearly as practicable on the centerline of the tow, a green light on the starboard side of the tow, so placed as to mark the maximum projection of the tow to starboard, and a red light on the port side of the tow, so placed as to mark the maximum projection of the tow to port.

(c) When one or more barges, canal boats, scows, or other vessels of nondescript type not otherwise provided for, are being towed alongside a steam vessel, there shall be displayed a white light at each outboard corner of the tow. If the deck, deck house, or cargo of such barge, etc., obscures the sidelight of the towing vessel, such barge, etc., shall also carry a green light upon the starboard side when being towed on the starboard side of a steam vessel or shall carry a red light on the port side of the barge, etc., when being towed on the port side of the steam vessel. If there is more than one such barge, etc., being towed abreast, the appropriate colored sidelight shall be displayed from the outer side of the outside barge.

(d) When one barge, canal boat, scow or other vessel of nondescript type not otherwise provided for, is being towed singly behind a steam vessel, such vessel shall carry four white lights, one on each corner or outermost projection of the bow and one on each corner or outermost projection of the stern.

(e) When two or more barges, canal boats, scows, or other vessels of nondescript type not otherwise provided for, are being towed behind a steam vessel in tandem, with an intermediate hawser, such vessels shall carry white lights as follows:

(1) The first vessel in the tow shall carry three white lights, one on each corner or outermost projection of the bow and a white light at the stern amidships.

(2) Each intermediate vessel shall carry two white lights, one at each end amidships.

(3) The last vessel in the tow shall carry three white lights, one on each corner or outermost projection of the stern and a white light at the bow amidships.

(f) When two or more barges, canal boats, scows, or other vessels of nondescript type not otherwise provided for, are being towed behind a steam vessel in tandem, close-up, such vessels shall carry white lights as follows:

(1) The first vessel in the tow shall carry three white lights, one on each corner or outermost projection of the bow and a white light at the stern amidships.

(2) Each intermediate vessel shall carry a white light at the stern amidships.

(3) The last vessel in the tow shall carry two white lights, one on each corner or outermost projection of the stern.

(g) When two or more barges, canal boats, scows, or other vessels of nondescript type not otherwise provided for, are being towed behind a steam vessel two or more abreast, in one or more tiers, each of the outside vessels in each tier shall carry a white light on the outboard corner of the bow, and each of the outside vessels in the last tier shall carry, in addition, a white light on the outboard corner of the stern.

(h) When one or more barges, canal boats, scows, or other vessels of nondescript type not otherwise provided for, are moored to the bank or dock in or near a fairway, such tow shall carry two white lights not less than four feet above the surface of the water, as follows:

(1) On a single moored barge, canal boat, scow, or other vessel of nondescript type not otherwise provided for, a light at each outboard or channelward corner.

(2) On barges, canal boats, scows, or other vessels of nondescript type not otherwise provided for, when moored in a group formation, a light on the upstream outboard or channelward corner of the outer upstream boat and a light on the downstream outboard or channelward corner of the outer downstream boat; and in addition, any boat projecting toward or into the channel from such group formation shall have two white lights similarly placed on its outboard or channelward corners.

(i) The colored side lights shall be so constructed as to show a uniform and unbroken light over an arc of the horizon of 10 points of the compass, so fixed as to show the light from right ahead to 2 points abaft the beam on their respective sides, and of such a character as to be visible at a distance of at least 2 miles, and shall be fitted with inboard screens so as to prevent either light from being seen more than half a point across the centerline of the tow.

(j) The amber light shall be so constructed as to show a uniform and unbroken light over an arc of the horizon of 20 points of the compass, so fixed as to show the light 10 points on each side of the tow, namely, from right ahead to two points abaft the beam on either side, and of such a character as to be visible at a distance of at least 2 miles.

(k) The white lights shall be so constructed and so fixed as to show a clear, uniform, and unbroken light all around the horizon, and of such a character as to be visible at a distance of at least 2 miles.

(l) All the lights shall be carried at approximately the same height above the surface of the water and, except as provided in paragraph (h) of this section, shall be so placed with respect thereto as to be clear of and above all obstructions which might tend to interfere with the prescribed arc or distance of visibility.

(Sec. 2, 30 Stat. 102, as amended, sec. 1, 30 Stat. 98, as amended; 33 U. S. C. 157, 178. Interpret or apply R. S. 4233A, as amended; 33 U. S. C. 353)

SUBCHAPTER F—NAVIGATION REQUIREMENTS FOR WESTERN RIVERS

PART 95—PILOT RULES FOR WESTERN RIVERS

LIGHTS FOR FERRYBOATS AND BARGES

1. Section 95.29 is amended to read as follows:

§ 95.29 Lights for barges towed ahead or alongside. (a) When one or more barges are being towed by pushing ahead of a steam vessel, such tow shall be lighted by an amber light at the extreme forward end of the tow, so placed as to be as nearly as practicable on the centerline of the tow, a green light on the starboard side of the tow, so placed as to mark the maximum projection of the tow to starboard, and a red light on the port side of the tow, so placed as to mark the maximum projection of the tow to port.

(b) When one or more barges are being towed alongside a steam vessel, there shall be displayed a white light at each outboard corner of the tow. If the deck, deck house, or cargo of such barge obscures the sidelight of the towing steam vessel, such barge shall also carry a green light upon the starboard side when being towed on the starboard side of a steam vessel; or shall carry a red light on the port side of the barge when being towed on the port side of the steam vessel. If there is more than one such barge being towed abreast, the appropriate colored sidelight shall be

displayed from the outer side of the outside barge.

(c) The colored side lights shall be so constructed as to show a uniform and unbroken light over an arc of the horizon of 10 points of the compass, so fixed as to show the light from right ahead to 2 points abaft the beam on their respective sides and of such a character as to be visible at a distance of at least 2 miles, and shall be fitted with inboard screens so as to prevent either light from being seen more than half a point across the centerline of the tow.

(d) The amber light shall be so constructed as to show a uniform and unbroken light over an arc of the horizon of 20 points of the compass, so fixed as to show the light 10 points on each side of the tow, namely, from right ahead to 2 points abaft the beam on either side, and of such a character as to be visible at a distance of at least 2 miles.

(e) The white lights shall be so constructed and so fixed as to show a clear, uniform, and unbroken light all around the horizon, and of such a character as to be visible at a distance of at least 2 miles.

(f) All the lights shall be carried at approximately the same height above the surface of the water and shall be so placed with respect thereto as to be clear of and above all obstructions which might tend to interfere with the prescribed arc or distance of visibility.

(R. S. 4233A; 33 U. S. C. 353)

2. Section 95.31 is amended to read as follows:

§ 95.31 Lights for barges towed astern. (a) When one barge is being towed singly behind a steam vessel, such vessel shall carry four white lights, one on each corner or outermost projection of the bow and one on each corner or outermost projection of the stern.

(b) When two or more barges are being towed behind a steam vessel in tandem, with an intermediate hawser, such vessels shall carry white lights as follows:

(1) The first vessel in the tow shall carry three white lights, one on each corner or outermost projection of the bow and a white light at the stern amidships.

(2) Each intermediate vessel shall carry two white lights, one at each end amidships.

(3) The last vessel in the tow shall carry three white lights, one on each corner or outermost projection of the stern and a white light at the bow amidships.

(c) When two or more barges are being towed behind a steam vessel in tandem, close-up, such vessels shall carry white lights as follows:

(1) The first vessel in the tow shall carry three white lights, one on each corner or outermost projection of the bow and a white light at the stern amidships.

(2) Each intermediate vessel shall carry a white light at the stern amidships.

(3) The last vessel in the tow shall carry two white lights, one on each corner or outermost projection of the stern.

(d) When two or more barges are being towed behind a steam vessel two or more abreast, in one or more tiers, each of the outside barges in each tier shall carry a white light on the outboard corner of the bow and each of the outside barges in the last tier shall carry, in addition, a white light on the outboard corner of the stern.

(e) The white lights shall be so constructed and so fixed as to show a clear, uniform, and unbroken light all around the horizon and of such a character as to be visible at a distance of at least 2 miles. The lights shall be carried at approximately the same height above the surface of the water and shall be so placed with respect thereto as to be clear of and above all obstructions which might tend to interfere with the prescribed arc or distance of visibility.

(R. S. 4233A; 33 U. S. C. 353)

---

more on **NUCLEAR SHIPS**

engineer roster of the ship operator. The reporting date for the licensed engineering officers will be on or about 1 September 1958. Training for the remainder of the crew will be scheduled after September 1958. In addition to the training of licensed engineering officers of the selected operator of the N. S. *Savannah*, the Maritime Administration has considered including in the training program, one qualified candidate from other shipping operators contemplating expansion in the near future into nuclear-powered merchant ship operations. This training would be at each operator's expense.

The N. S. *Savannah* has been considered as a future facility for training crews for other nuclear-powered ships as the nuclear ship program expands. Therefore, it is anticipated that an on-the-job training program will be organized for presently licensed Marine Engineers and other certificated qualified members of the engine department to gain the experience required by the Atomic Energy Commission in the operation of nuclear propulsion machinery, to qualify for the license as Reactor Operator.

Coast Guard licensed Marine Engineers and certificated members of the engine department may, upon presentation of an Atomic Energy Commission license as Reactor Operator, apply at any Marine Inspection Office to have their Merchant Mariners' Document endorsed to read "See AEC License as Reactor Operator" or other appropriate grade as indicated upon the face of the Atomic Energy Commission license.

If additional information is desired concerning the training of marine engineers as Reactor Operators for the N. S. *Savannah* or the program in general, it is suggested that inquiry be made to Mr. William I. Niedermair, Chief, Operations Branch, Office of Nuclear Projects, at the Maritime Administration, 441 G Street NW., Washington 25, D. C., Room 3128.

more on **TOW BOATS**

Of the 385 million net tons of cargo handled on the inland waterways in 1956, the following were the chief commodities: petroleum and petroleum products, 129 million net tons; mining products, including coal and ores, 104 million; construction materials, 76 million; forest products, 25 million; agricultural products, 9 million; iron and steel, 9 million; and chemicals, 7 million.

From these statistics it is readily apparent that much of the barge movements are of raw materials in bulk form and other commodities that move in large volumes, with generally lower unit values.

However, industry is shipping more and more of its semi-finished and finished products over the waterways as it is faced with significant increases in the cost of labor and other expenses. By concentrating on modern methods of packaging, materials handling and transportation, industry is reducing costs in the highly competitive economy.

The smooth easy movement of the barges and the careful handling in loading and unloading have made damage claims in barge shipments virtually nil. The well-designed, lidded and sealed barges make the use of this cheap, smooth, virtually shockless method of transportation for manufactured or bulk products a cost-saving inducement to practically all major industries.

All kinds of products in multi-wall bags can be, and have been, shipped by barge, including sugar and other foodstuffs. Cartoned, crated and boxed manufactured and fabricated products moved by barge include television sets, machinery parts, appliances, beer, food, shoes, notions, canned goods, magazines, paint and others. Pool barges of all sorts are in use, although not extensively, with perhaps 10 consignees getting cargo out of one barge.

The public and private terminal operations have played an important part in the rise of barge transportation to an accepted and full-fledged partner in the country's transportation services.

(The next article will deal with the operations of the tow, including the problems of navigation peculiar to the inland waterways system, as well as the make-up of the crew and its duties and other related matters on operation.)

ing ullage screens," "frozen reach rods," "broken port glass." Poor housekeeping is not economy; it is certainly not safety.

ROLE OF COAST GUARD INSPECTION

Coast Guard Inspection is not intended to supplant the marine industry's responsibility for safety. Safety is a design criterion and an operating criterion for the industry to voluntarily follow. Coast Guard Inspection is not quality control; it is safety control. It is not an evaluation for the optimum design or application of material, although preventive inspection for safety occasionally takes the Coast Guard into this realm. The benefits that accrue to production or design as a consequence of industrial inspection are always secondary to inspection's purpose.

The Coast Guard sees its role as cooperating with the marine industry in making vessels that fly the United States Flag the safest afloat. We are aware, in fulfilling this role, of the financial effect that inspection has on the industry. We are willing to deal with changes of material and method. We are anxious to find the deficiencies early, before time and materials are wasted. To this end, we are in the process of decentralizing the plan approval work of the Merchant Marine Technical Division to areas of greatest shipbuilding and design activity, in order to reduce the time delay in handling plans and to improve the cooperation with the inspection force and the shipbuilder.

It is doubtful that common sense, good seamanship or good design can ever be guaranteed by regulation. The Coast Guard would rather cooperate toward bringing them about than have to regulate them. The Service intends itself and prefers itself as a working partner in its performance of marine inspection.

Capt. Paul R. Jones, Jr., of the SS *Limon* has received a Letter of Commendation from Clarence G. Morse, Maritime Administrator, for his seamanship in the rescue of the crew of the tuna clipper *Sun Pacific*. Full details of this rescue were included in the May 1958 issue of the *Proceedings*.

INVESTIGATING UNITS

Coast Guard Merchant Marine Investigating Units and Merchant Marine Details investigated a total of 3,033 cases during the second quarter of 1958. From this number, hearings before Examiners resulted involving 29 officers and 259 unlicensed men. In the case of officers, 1 license was revoked, 4 were suspended without probation granted, 8 were suspended with probation granted, 2 cases were dismissed after hearing, and 2 hearings were closed with admonitions. Of the unlicensed personnel, 25 documents were revoked, 23 were suspended without probation, 94 were suspended with probation granted, 31 hearings were closed with admonition, and 19 cases were dismissed after hearing. Six licenses and 106 documents were voluntarily surrendered.

MERCHANT MARINE PERSONNEL STATISTICS

MERCHANT MARINE OFFICER LICENSES ISSUED

QUARTER ENDING 30 JUNE 1958

DECK

Grade	Original	Renewal
Master:		
Ocean	74	573
Coastwise	11	41
Great Lakes	31	175
B. S. & L.	15	143
Rivers	12	58
Radio officer licenses issued	13	35
Chief mate:		
Ocean	52	113
Coastwise		4
Mate:		
Great Lakes		1
B. S. & L.		
Rivers		
Second mate:		
Ocean	56	117
Coastwise	3	1
Third mate:		
Ocean	50	118
Coastwise		1
Pilots:		
Great Lakes	62	93
B. S. & L.	147	46
Rivers	144	30
Master: Uninspected Vessels	10	14
Mate: Uninspected Vessels	20	63
Motorboat operators	745	1,075
Total	1,445	2,701
Grand total	4,146	

ENGINEER

Grade	Original	Renewal
STEAM		
Chief engineer:		
Unlimited	30	547
Limited	14	131
First assistant engineer:		
Unlimited	48	162
Limited		19
Second assistant engineer:		
Unlimited	42	186
Limited		2
Third assistant engineer:		
Unlimited	86	215
Limited	3	
MOTOR		
Chief engineer:		
Unlimited	11	91
Limited	41	148
First assistant engineer:		
Unlimited	4	19
Limited	11	16
Second assistant engineer:		
Unlimited	6	30
Limited		1
Third assistant engineer:		
Unlimited	66	252
Limited	1	
Chief engineer: Uninspected Vessels	6	8
Assistant engineer: Uninspected Vessels	7	2
Total	376	1,829
Grand total	2,205	

WAIVER OF MANNING REQUIREMENTS

Waivers	Atlantic Coast	Gulf Coast	Pacific Coast	Great Lakes	Total
Deck officers substituted for higher ratings					
Engineer officers substituted for higher ratings			1	2	3
O. S. for A. B.			4		4
Wiper or coalpassers for Q. M. E. D.		1	1	1	3
Total waivers		1	6	3	10
Number of vessels		1	2	2	5

ORIGINAL SEAMEN'S DOCUMENTS ISSUED

Type of document	Atlantic Coast	Gulf Coast	Pacific Coast	Great Lakes and rivers	Total
Staff Officer	30	8	28	1	67
Continuous Discharge Book					
Merchant Mariner's Documents	1,415	487	748	1,062	3,712
AB any waters unlimited	105	30	46	43	224
AB any waters, 12 months	51	12	23	37	123
AB Great Lakes, 18 months	3		6	29	38
AB Tugs and Towboats, any waters	1	5	3		9
AB Bays and Sounds	3		1		4
AB Seagoing Barges		2			2
Lifeboatman	151	44	57	13	265
QMED	181	41	56	87	365
Radio Operators					
Certificate of Service	1,316	415	714	942	3,387
Tankerman	15	71	5	70	161
Total	3,271	1,115	1,687	2,284	8,357

DANGEROUS CARGO REGULATIONS IN NEW VOLUME

The Coast Guard's "Gray Book" of Dangerous Cargo Regulations has been discontinued.

CG–187, Explosives or Other Dangerous Articles on Board Vessels, is replaced by a new volume of Title 46, Code of Federal Regulations. In the interest of economy and to avoid duplication of the same information of two Government publications, the Division of the Federal Register has agreed to publish semiannual cumulative pocket supplements of parts 146 and 147, Volume II of Title 46, Code of Federal Regulations.

This publication will contain all Dangerous Cargo Regulations which were in effect on January 1, 1958 and will be divided into parts and subparts exactly the same as CG–187. The supplements will be issued approximately 30 days subsequent to the time the semiannual amendments appear in the Federal Register, it was pointed out.

Copies of the new Volume II of Title 46, Code of Federal Regulations, containing parts 146 and 147, may be obtained as a sales publication from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price $5.50.

DANGEROUS CARGO REGULATIONS

(Pocket Supplement)

The cumulative pocket supplement to 46 CFR Part 146 to Part 149 (Dangerous Cargo Regulations) will be available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., on and after 8 August 1958. Price $1. This cumulative supplement contains all amendments to these regulations as of 1 July 1958. Said amendments were published in the Federal Register, Volume 23, Number 127, dated 28 june 1958.

NUMBERED AND UNDOCUMENTED VESSELS

The table below gives the cumulative total of undocumented vessels numbered under the provisions of the act of June 7, 1918, as amended (46 U. S. C. 288), in each Coast Guard district by Customs ports for the quarter ended 30 June 1958. Generally speaking, undocumented vessels are those machinery-propelled vessels of less than 5 net tons engaged in trade which by reason of tonnage are exempt from documentation. They also include all other vessels propelled in whole or in part by machinery which have not been issued marine documents by the Customs, owned in the United States and found on the navigable waters thereof.

Coast Guard District	Customs Port	Total
1 (Boston)	(4) Boston	18,614
	(1) Portland, Maine	9,941
	(2) St. Albans	956
	(5) Providence	5,297
	Total	**34,808**
2 (St. Louis)	(45) St. Louis	13,124
	(12) Pittsburgh	2,440
	(34) Pembina	263
	(35) Minneapolis	3,383
	(40) Indianapolis	7,040
	(42) Louisville	2,964
	(43) Memphis (part)	6,864
	(46) Omaha	527
	(47) Denver	50
	Total	**36,655**
3 (New York)	(10) New York	56,949
	(6) Bridgeport	11,264
	(11) Philadelphia	24,129
	Total	**92,342**
5 (Norfolk)	(14) Norfolk	18,178
	(13) Baltimore	25,805
	(15) Wilmington, N. C	9,415
	Total	**53,398**
7 (Miami)	(18) Tampa (part)	31,033
	(16) Charleston	1,756
	(17) Savannah	2,809
	(49) San Juan	538
	(51) St. Thomas	142
	Total	**36,277**
8 (New Orleans)	(20) New Orleans	22,756
	(18) Tampa (part)	560
	(19) Mobile	9,123
	(21) Port Arthur	4,894
	(22) Galveston	11,030
	(23) Laredo	1,965
	(24) El Paso	29
	(43) Memphis (part)	65
	Total	**50,422**
9 (Cleveland)	(41) Cleveland	12,721
	(7) Ogdensburg	2,048
	(8) Rochester	7,075
	(9) Buffalo	4,735
	(36) Duluth	2,803
	(37) Milwaukee	4,791
	(38) Detroit	25,803
	(39) Chicago	10,873
	Total	**71,749**
11 (Long Beach)	(27) Los Angeles	16,960
	(25) San Diego	2,898
	(26) Nogales	221
	Total	**20,079**
12 (San Francisco)	(28) San Francisco	**18,735**
13 (Seattle)	(30) Seattle	24,142
	(29) Portland, Oreg	9,170
	(33) Great Falls	814
	Total	**34,126**
14 (Honolulu)	(32) Honolulu	**4,046**
17 (Juneau)	(31) Juneau	**8,480**
	Grand total	**461,117**

APPENDIX

AMENDMENTS TO REGULATIONS

EQUIPMENT APPROVED BY THE COMMANDANT

[EDITOR'S NOTE.—Due to space limitations, it is not possible to publish the documents regarding approvals and terminations of approvals of equipment published in the Federal Register dated July 4, 1958 (CGFR 58–26). Copies of these documents may be obtained from the Superintendent of Documents, Washington 25, D. C.]

ARTICLES OF SHIPS' STORES AND SUPPLIES

The certification date for No. 288, GAMLEN SEA-CLEAN, has been changed to 6 June 1958 instead of 24 April 1958 as previously published in the June issue of the *Proceedings*.

AFFIDAVITS

The following affidavit was accepted during the period from 15 June 1958 to 15 July 1958:

Kunkle Valve Co., 119–125 South Clinton Street, Fort Wayne, Ind., FITTINGS.

Courtesy The Range Light

MARINE SAFETY PUBLICATIONS AND PAMPHLETS

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

CG No.	*Title of Publication*
101	Specimen Examinations for Merchant Marine Deck Officers. 1–50
108	Rules and Regulations for Military Explosives. 5–15–54
115	Marine Engineering Regulations and Material Specifications. 3–1–58
123	Rules and Regulations for Tank Vessels. 4–1–58
129	Proceedings of the Merchant Marine Council. Monthly
	Motorboat Safety. 1957–1958
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. 4–1–58
172	Pilot Rules for the Great Lakes and Their Connecting and Tributary Waters. 4–1–58
174	A Manual for the Safe Handling of Inflammable and Combustible Liquids. 7–2–51
175	Manual for Lifeboatmen and Able Seamen, Qualified Members of Engine Department, and Tankerman. 6–1–55
176	Load Line Regulations. 11–1–53
182	Specimen Examinations for Merchant Marine Engineer Licenses. 5–1–57
184	Pilot Rules for the Western Rivers. 7–1–57
190	Equipment Lists. 3–1–56
191	Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel. 9–15–55
200	Marine Investigation Regulations and Suspension and Revocation Proceedings. 4–13–53
220	Specimen Examination Questions for Licenses as Master, Mate, and Pilot of Central Western Rivers Vessels. 4–1–57
227	Laws Governing Marine Inspection. 7–3–50
239	Security of Vessels and Waterfront Facilities. 7–1–58
249	Merchant Marine Council Public Hearing Agenda. Annually
256	Rules and Regulations for Passenger Vessels. 3–1–57
257	Rules and Regulations for Cargo and Miscellaneous Vessels. 6–1–55
258	Rules and Regulations for Uninspected Vessels. 7–1–55
259	Electrical Engineering Regulations. 7–1–58
266	Rules and Regulations for Bulk Grain Cargo. 2–13–53
267	Rules and Regulations for Numbering Undocumented Vessels. 1–15–53
268	Rules and Regulations for Manning of Vessels. 9–3–57
269	Rules and Regulations for Nautical Schools. 11–1–53
270	Rules and Regulations for Marine Engineering Installations Contracted for Prior to July 1, 1935. 11–19–52
290	Motorboats. 7–1–58
293	Miscellaneous Electrical Equipment List. 4–15–58
320	Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf. 1–2–57
323	Rules and Regulations for Small Passenger Vessels. (Not More Than 65 Feet in Length.) 6–1–58

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

Changes Published During July 1958

The following has been modified by Federal Register:
CG–190 Federal Register, July 4, 1958.

U. S. GOVERNMENT PRINTING OFFICE: 1958