PROCEEDINGS OF THE
MERCHANT MARINE COUNCIL

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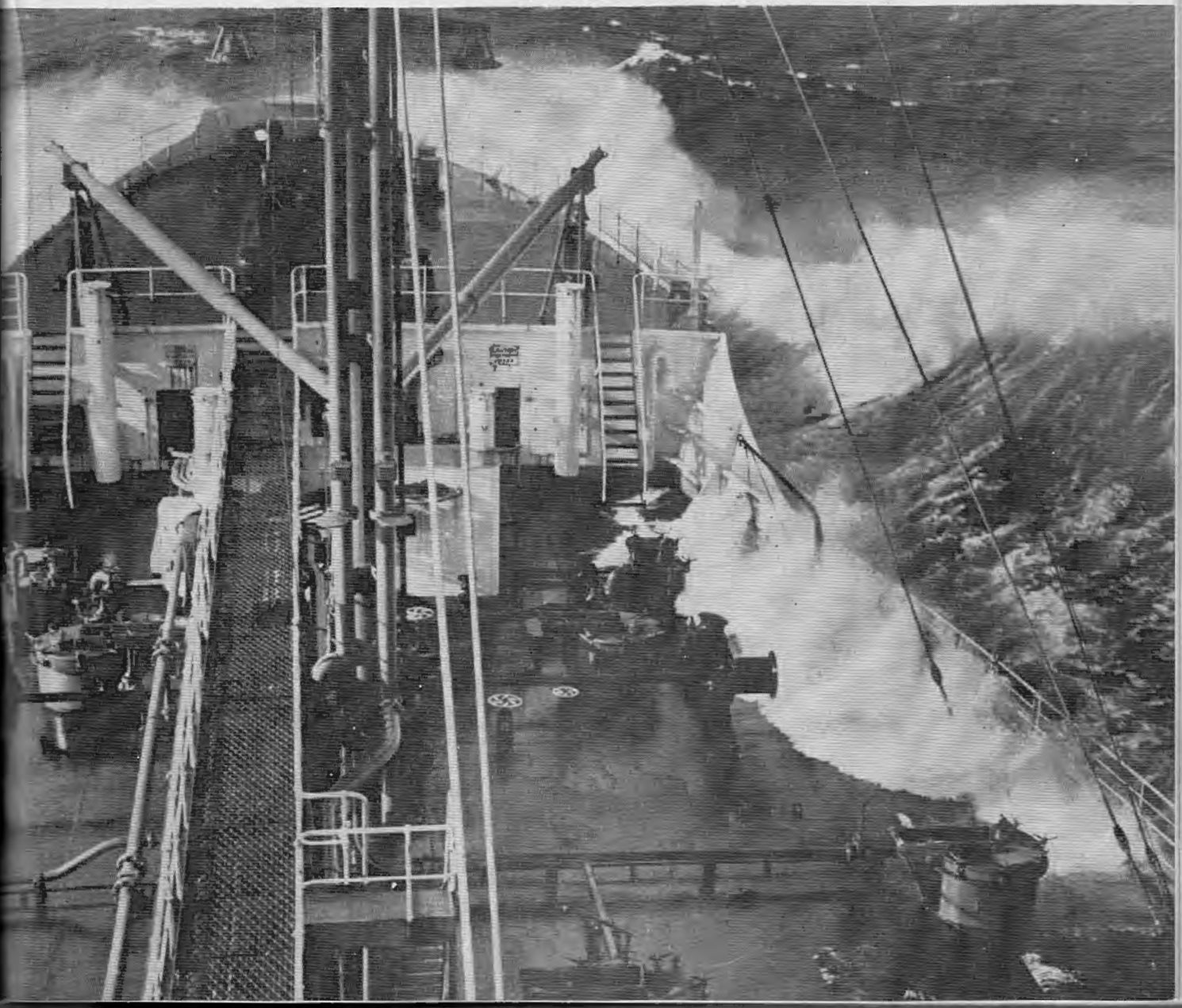

Proceedings of the

MERCHANT MARINE COUNCIL

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The Merchant Marine Council of the United States Coast Guard

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COUNCIL ACTIVITIES

The Merchant Marine Council will hold a Public Hearing on Tuesday, 7 May 1957, commencing at 9:30 a. m., in Room 4120, Coast Guard Headquarters, 13th and E Streets NW., Washington, D. C., for the purpose of receiving comments, views, and data on the proposed changes in the vessel inspection rules and regulations as set forth in Item I to XVI, inclusive, of the Merchant Marine Council Public Hearing Agenda, CG-249, dated May 1957. Copies of the Agenda are mailed to persons and organizations who have expressed a continued interest in the subjects under consideration and have requested that copies be furnished them. Copies of the Agenda will be furnished, upon request to the Commandant (CMC), United States Coast Guard, Washington 25, D. C., so long as they are available.

The Agenda is composed of the following:

Item No.	Subject
I.	Deck Licenses as Master and Chief Mate for Vessels Engaged in Offshore Mineral and Oil Industry.
II.	Lifeboatmen, Examination and Demonstration of Ability.
III.	License as First Assistant Engineer of Steam and Motor Vessels of not over 1,000 Horsepower.
IV.	Drydocking of Passenger, Tank, Cargo, and Miscellaneous Vessels.
V.	Crew Accommodations on Tank Ships.
VI.	Marine Engineering Regulations and Material Specifications; Miscellaneous Amendments.
VII.	Cork and Balsa Wood Life Preservers; Withdrawal of Specifications and Terminations of Approvals to Manufacture.
VIII.	Structural Fire Protection for Passenger Vessels.
IX.	Recessed Bulkheads for Passenger Vessels.
X.	Fixed Fire Protection Requirements for Barges.
XI.	Fire Protection Equipment for Passenger, Cargo, and Miscellaneous Vessels.
XII.	Markings on Lifeboat Release Gear Lever.
XIII.	Stowage of Heavy Grain in Bulk; Vessels Partially Loaded and Shifting to Other Ports.
XIV.	Stowage of Bulk Ores on General Cargo Vessels.
XV.	Inspection of Cargo Gear on Passenger, Cargo and Miscellaneous Vessels.
XVI.	Dangerous Cargo Regulations; Miscellaneous Amendments.

NUCLEAR POWERED MERCHANT SHIP

By Richard P. Godwin

(Project Manager for Nuclear Powered Merchant Ship)

UNLIKE the situation which existed when the change occurred from sail to steam there are few ship owners today who ridicule the idea of nuclear powered merchant vessels. As a matter of fact my concern is more with those who have stretched theory to the point of possibly over-selling the idea.

Economic propulsive power is still some years away but in our fast moving world we have found that five or ten years is practically tomorrow. In fact technological accomplishments have come at such a rate in recent years that we are more often than not economically unprepared to accept them.

A question arises at the outset. Why should the United States undertake a program to build nuclear propelled commercial ships? There are several reasons. Some concern national security. A nuclear propelled maritime fleet would not be dependent on foreign fuel sources. It would also help to conserve our dwindling supplies of fossil fuels.

A major reason for this country's interest is our belief that maritime ship propulsion is one of the most economically promising applications of nuclear energy. Let us examine this belief for a moment.

The problem of achieving low cost energy from nuclear reactors is confronting us in our development of stationary land reactors. We are finding it difficult to meet at the outset the competition offered by our supplies of cheap fossil fuels and by the efficiency of modern power plants. In shipboard applications, however, nuclear reactors give promise of becoming economic as soon if not somewhat sooner than in domestic stationary land plants in the intermediate range. There are several reasons for this. To begin with, nuclear propulsion plants are likely to be more compact than conventional plants. Also, space will not be required to store fuel. These space savings can be converted into pay load.

HIGHER SUSTAINED SPEEDS

Then, it is expected that nuclear ships will be able to achieve higher sustained speeds over longer runs than conventionally powered ships, factors which will add to gross income. Since refueling will not be required, moreover, nuclear ships will require less time for turn-around in port, further adding to their earnings efficiency. Factors such as these are believed to have a total effect more than offsetting what might at first be relatively higher fuel costs for nuclear-propelled ships as compared with ships using conventional fuels.

It is not considered, moreover, that higher fuel costs need be the rule for long. Much progress is being made in the development of reactors for land-based central station power plants. A large part of this technology is transferable to maritime applications. Also, it is to be expected that in the next several years a number of new concepts of specific application to maritime propulsion will have been proven out. I will have more to say about these a bit later. Additional cost cutting factors which may be expected to take effect in the years just ahead include the elimination of security costs as reactors are built more and more on an unclassified basis, and the saving which may result from bringing to bear on reactor work the cost cutting incentives of private industry. Also marine plants can probably be built in existing shipyards already well equipped with facilities and personnel.

Another question which might arise is why there is need for a separate maritime nuclear propulsion program in view of the fact that so much work has already been done on nuclear propulsion for naval vessels. There is no doubt that much of the information accumulated in the naval reactors program will be exceedingly useful. It is also true, however, that the needs and major emphases of a merchant ship program differ considerably from those which govern a naval program. For example, the adaption of nuclear energy to naval vessels is a matter of national defense and possibly national survival itself. In the areas of merchant shipping the acceptance of nuclear power will be determined by economics. Thus, it is not necessary for commercial ships to have the maneuverability or ability to meet military emergencies which are required in naval vessels. On the other hand, the maritime program will stress cost reduction to a far greater degree than would be prudent in military programs.

NUCLEAR SHIP PLANS

These, then, are some of the considerations which lie behind the interest of this country in a program to develop nuclear propelled maritime vessels. What are we doing about it?

The United States nuclear merchant ship program is going forward along two major avenues. The first is a short-range program aimed at learning some of the rudimentary technical and economic facts of life about nuclear vessels by actually building one or more of them. The second is a nuclear power plant development program to be carried out over a number of years which aims at achieving commercially competitive propulsive power for merchant ships.

It will be noted that the first program is not primarily concerned with costs, while cost factors are a major consideration in the second one.

The Maritime Administration of the Department of Commerce and the Atomic Energy Commission are working together in the performance of this work. A joint group has been formed composed of personnel from each agency who will be responsible for the conduct of the program. It is our belief that the joint group approach will result in the earliest development of competence in the nuclear ship field.

This is the organization for Government activity. What about participation by industry? It has been assumed that the Government must provide financial support at first and accept the major initial risks. We hope to develop a basis for greater participation by industry as time passes. This transition may be similar to the one which is taking place with respect to central station nuclear power development. The Government has sponsored development and construction up to a point where private industry is able to carry the work forward with Government subsidy provided in some instances.

FIXED PRICE CONTRACT

Even in the present state of the art we hope to enlist the cost-cutting incentives of industry to some extent by use of fixed price contracts. We are hopeful, for example, that both the ship construction and propulsion plant for the first nuclear propelled vessel can be procured in this manner. I might point out here that this will be the first reactor system of such great power to be produced for the Government under a fixed price contract.

Further, it is our hope that manufacturers of the nuclear propulsion plant will provide performance and material guarantees similar to those provided for conventional propulsion equipment.

Let us now consider in a little more detail the first part of the overall program, that part which deals with construction of the first ship.

The President, on October 15, 1956, implementing Congressional legislation, directed the Maritime Administration and the Atomic Energy Commission to proceed as rapidly as possible with design and construction of the first nuclear powered merchant ship.

Two major decisions concerning this ship have already been made. One concerns the type of ship. It will be a combination cargo-passenger vessel of 12,000 tons deadweight. (*See Figure 1.*) It will be 595 feet in length and have a 78-foot beam. It is expected to have a service speed of 21 knots.

The other decision concerns the type of reactor to be used for the power plant. It will be a pressurized water reactor capable of providing 22,000 shaft horsepower. You might be interested in some of the thinking which lies behind each of these decisions. First as to the type of ship: There has been some thought that the first ship should be a tanker rather than a passenger cargo vessel. There is little doubt that large tankers can employ nuclear propulsion to greater economic advantage than can passenger cargo vessels. This results from the fact that even with high capital costs and inefficient power plants their unique operation is such as to most closely approximate an optimum application, i. e., high power demands over extended runs and the ability to utilize space made available by a small power plant. We do not contemplate, however, that the first ship can be economically competitive under any circumstances, owing to the need for practical building and operating experience. Consequently, this economic advantage of the tanker did not seem compelling.

A FLOATING LABORATORY

Our objectives with respect to the first ship are more along the lines of having a trail blazer, or as the President has phrased it, "a floating laboratory providing indispensable information for the further application of atomic energy in the field of ocean transportation." For example, we would hope that it might establish basis for improvements in reactor fuels, simplification of reactors and propulsion machinery, and improvements in marine equipment. In a passenger cargo vessel we believe we will be able to install a plant of great flexibility which we can continually analyze and improve. Also, this type of ship seems to lend itself better to other necessary learning procedures, such as training of crews, and demonstration of operation to engineers and scientists, both at home and abroad. Use of a cargo vessel will also enable us to come to grips at an early date with problems involved in obtaining international acceptance of nuclear powered ships.

Nations which lie along commercial trade routes must be given the opportunity to inspect and understand nuclear-powered vessels not only as a potential competitor in the shipping industry but also as users of ports and shore facilities. A super-tanker would characteristically be operated over the longest trade routes at high continuous power with few ports of call. It would offer fewer learning opportunities of the kinds noted above. It also seems premature to plan such extended commercial operation until fuller know-how has been achieved. If we postpone resolving these problems now we must certainly face them later.

Let us turn now to the second major decision already made concerning the first ship, selection of the type of reactor. Why was the pressurized water system selected?

As you may know, there are a very large number of alternative systems by which it is possible to produce heat in a nuclear reactor. Several of these systems have achieved considerable development in other programs of the Atomic Energy Commission. As a result of extensive experience already had, however, the pressurized water system seemed to be the only one which we can build and operate now with a great degree of certainty as to its performance. We know it to be one of the more stable and inherently safe systems available. This factor of familiarity argued for its selection. We wanted to get construction underway so that we may learn the practical facts about commercial nuclear propulsion. We did not want to risk delay on the first ship because of reactor uncertainties.

PRESSURIZED WATER TYPE

We realize that there are other systems which may prove to be superior to the pressurized water type for maritime use, particularly with respect to costs. We have by no means reached the point where considerable cost reductions in the pressurized water system are not possible however.

This brings us to more detailed consideration of the second major avenue of work in the Government's program for development of nuclear propelled merchant ships. You will recall that this consists of a long range program aimed at developing economic powerplants for merchant ships.

This program involves at this time six design feasibility studies on four different type of nuclear propulsion plants. Depending on the outcome of these studies, we hope to start the

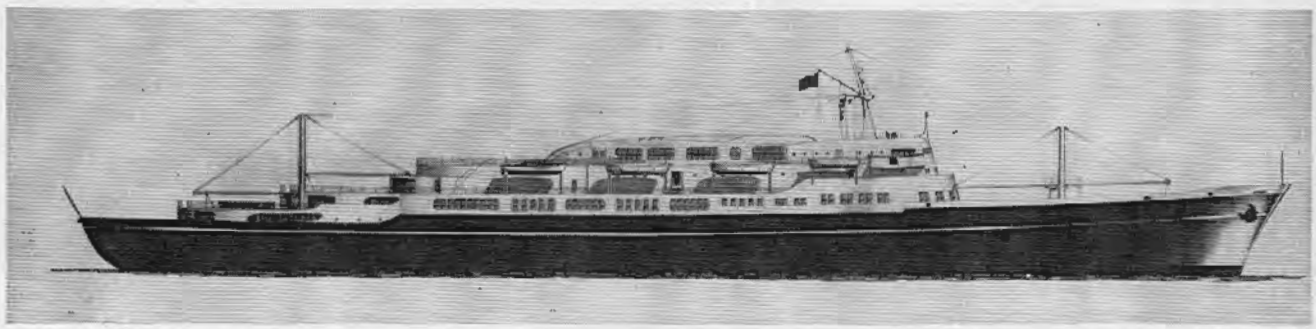


Photo courtesy Maritime Administration

Figure 1. **Artist's conception of passenger-cargo nuclear powered ship.**

development next year of an actual experimental or prototype engineered specifically for merchant ship application.

I should explain that the normal process of development for a new reactor concept requires three steps. The first one consists of basic theoretical study and of research and development work at the laboratory. This is the stage we are in now with our six design feasibility studies. As our understanding of a system increases we may undertake to build and operate a reactor experiment. These are smaller plants than would be required for the full-scale application we have in mind but they are large enough to give information about such things as control and operating characteristics, component behavior and system stability. This is the stage we hope to reach with one or more concepts next year.

Assuming success through the first two phases, a full scale prototype plant of a given type may be built to understand better the construction and operating economics of full scale plants.

It will be seen that one of the important results of the development program will be to make it possible for decisions on reactor systems selected for future ships to be supported by practical experience. Studies of reactors not yet constructed and operated often make them seem more promising than reactors which have been operated. Actual experience, however, does not always bear out the promise. We want to avoid making future selections on the basis of theory alone.

LOWER COST PREDICTED

If we are called upon to undertake a second ship in the near future, say one year or more from now, we are confident that the development program will by then have proceeded far enough to permit us to achieve a significant lowering of costs. Should the second ship be a super-tanker, there is a very good chance that it can operate in the black from the outset, although it will not necessarily be competitive.

Another interesting forecast which can be made about the second ship is that, if it is started within two years after construction begins on the first ship, it may go into actual commercial use at about the same time, or within a month or two after the first ship does.

The reason for this is that in the case of the first ship, we expect to take a longer time in test operation, training, demonstration and obtaining foreign acceptance before it actually goes commercial.

Up to this point I have outlined our short and long range developmental and construction plans. We are working also on a third problem area, one to which I have already alluded because it is interrelated with the technical ones we have been discussing. This area deals with problems associated with the initial operation of a nuclear merchant ship in foreign commerce. For example, it is necessary to develop various construction, operating and safety codes. There will be the problem of training crews so that they can handle and live with the new propulsion equipment. Also involved is establishing the requirements for shore facilities and the actual provisions of such facilities. Perhaps most important of all is the need to which I have referred before: To achieve acceptance by international agreement such as will permit a nuclear ship to operate in foreign trade using ports and facilities throughout the world. Pervading this whole area dealing with actual operation of nuclear ships is a consideration which should be of particular interest to this group, namely safety. We are of course quite aware of the potential hazards and have done extensive work in this subject area. In general we feel that properly trained people should be able to operate nuclear ships safely and without difficulty.

NO ACADEMIC TRAINING

Moreover, there does not seem to be need for operators to have elaborate technical backgrounds. The day-to-day control of the largest reactors the Commission now has in operation is in many cases entrusted to operators who, while expertly trained for their jobs, have had no academic or other previous background in nuclear energy.

To state our conclusion a different way: We do not believe that nuclear powered ships will be appreciably more hazardous than conventionally fueled ships. While it is true that a new hazard has been introduced into commercial shipping, namely radiation, it need not be an insurmountable difficulty if we design ships and train crews to meet this problem.

I would like to conclude my remarks with some guesses as to the future. We are living in a period during which we will watch possibly a slow but certainly a steady decline in the costs of nuclear power. It is my belief that in about 5 years nuclear propulsion will compete favorably from an economic standpoint with fossil fuel powerplants in new ships which it is proposed to operate at high speeds over long runs. This would involve large tankers from the very outset. As the costs of nuclear propulsion drop, and they will, smaller tankers, bulk cargo carriers, and large cargo ships will gravitate toward nuclear power.

Fairly large economies of scale are evident in the reactor business as it has been developed thus far. The relative cost of nuclear propulsion therefore will be higher where small plants are used. For this reason I do not feel that we can predict the time when the smaller vessels employed in inland or coastal shipping can profitably employ nuclear power.

All indications point to the fact that we stand on the threshold of the nuclear age in merchant shipping. I am convinced that progress from here on out will be swift and most probably dramatic.

MERCHANT MARINE STATISTICS

There were 1,099 vessels of 1,000 gross tons and over in the active ocean-going U. S. merchant fleet on January 1, 1957, according to the Merchant Marine Data Sheet released recently by the Maritime Administration, U. S. Department of Commerce. This was 23 more than the number active on December 1, 1956, and 27 more than the number on January 1, 1956.

There were 60 Government-owned and 1,039 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 or undergoing repairs. They also exclude 45 vessels in the custody of the Departments of Defense, State, and Interior.

The Maritime Administration's active fleet increased by 14 and its inactive fleet decreased by 24, as a number of vessels were taken under bareboat charter for the transport of foreign aid and bulk cargoes. In addition to the 5 vessels sold to private companies, 9 tankers were turned over to the MSTS, while 4 Navy-owned vessels were put into the Administration's reserve fleet. This made a net decrease of 5 vessels in the total merchant fleet, active and inactive, which numbered 3,175 on January 1, 1957. This was 66 ships less than the total fleet on January 1, 1956.

Delivery of 3 new vessels and 4 conversions and orders for 27 new tankers brought the total of merchant ocean-going vessels being built or under conversion to 90 compared with 32 on January 1, 1956.

RADAR PLOTTING—A CORRECTION AND DISCUSSION

THE January issue of the PROCEEDINGS featured an article on the legal aspects of radar, which included a statement relative to the use of plotting to determine course and speed of an observed vessel.

The article stated, "To be of any further value, a radar observation must be repeated several times, and the observations must be plotted on a plotting sheet, a Hydrographic Office 'maneuvering board,' or a transparent plotting device fitted over the radar screen itself. A line drawn between the various positions so plotted will then indicate the observed vessel's course."

What the author failed to amplify is the fact that motion observed on the PPI scope is *relative* movement. Actual motion is seen on your PPI scope only when your ship is stationary.

Figure 1 illustrates this point. Your vessel is on course 000° at a speed of 16 knots. Another ship is observed at three-minute intervals and after plotting shows a relative course of 143° and a speed of 20 knots. If this data were accepted as indicating the observed vessel's true course and speed, it is obvious how much in error this assumption would be. In the diagram the small arrows are used to illustrate the true direction of the observed ship, and normally would not appear on a shipboard plot.

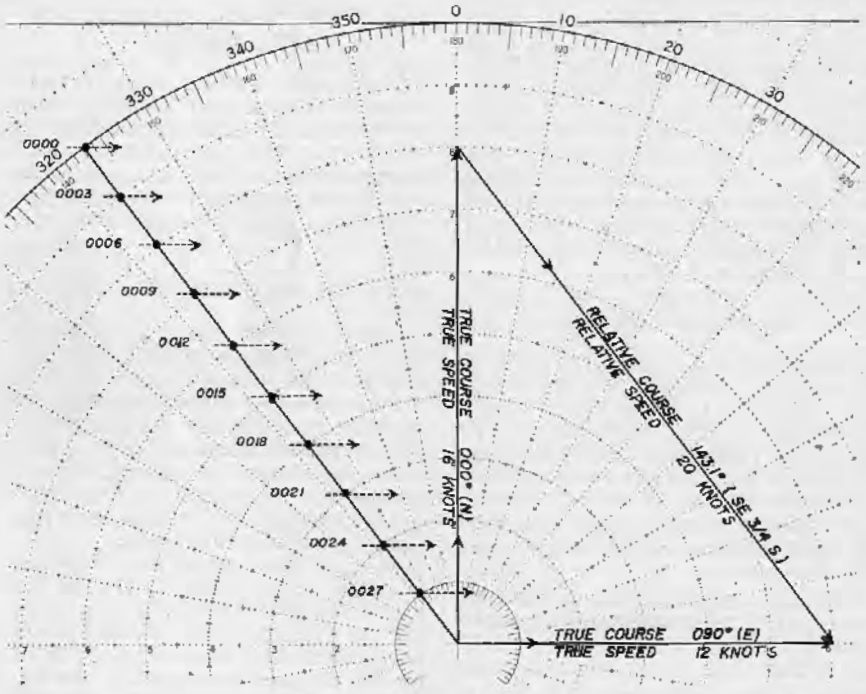


Figure 1.

ILLUSTRATED ABOVE is a typical maneuvering board problem for determining true course and speed of the vessel observed. The pips seen at three minute intervals show the course and speed of the observed vessel as seen in the PPI scope. The dashed arrows, which are not apparent to the scope observer, show the true course of the observed vessel. To the right is shown a vector diagram for the solution of the problem of true course and speed. The true course of the observing ship is 000° and a speed of 16 knots, employing the 2:1 scale. At the head of the vector arrow of the observing ship is placed the tail of the vectoring arrow representing the relative, or apparent, course and speed. This course is parallel to the course as observed on the radar scope and the speed is equal to that computed by determining the distance and time between pips. With the known quantities, true course and speed of the observing vessel, and the relative course and speed thus laid down, the true course and speed of the observed vessel can be obtained by drawing in the third arrow as indicated. Both the relative speed and the true speed of the observed vessel must be determined using the 2:1 scale also.

The diagram further shows how the relative course and speed obtained from radar observations is plotted to obtain the true course and speed. This differs by a substantial extent from the direction and speed of the pip observed on the PPI scope.

It cannot be overemphasized that radar observations must be translated from relative to true motion before any conclusions can be made on true course and speed.

A memorandum received at Coast Guard Headquarters from the British Ministry of Transport indicates that effective 1 June 1957 all candidates for second mate, foreign-going, or mate, home trade, will have to produce a certificate of proficiency that he is a qualified radar observer before he is issued his new certificate. Those men already sailing under their license must likewise qualify after the above date.

This radar course is intended to help the navigator to know the full possibilities of marine navigational radar and to make the best use of it, and also to know its limitations and safeguards to be used.

Here in the United States the Committee on Merchant Marine and Fisheries report on the safety aspects of the *Stockholm-Andrea Doria* collision included the following:

"Radar should be a very effective aid in preventing collision. Adequate training and plotting based on the use of radar have been continually stressed, but collision cases continue in increasing numbers. Investigation of such cases shows that data made available by the use of radar obviously were not properly utilized to prevent collision. The *Andrea Doria-Stockholm* collision would have been prevented if the information by radar had been properly used.

"To qualify as a deck officer on seagoing ships a candidate must show evidence of his ability to use the traditional navigation equipment, such as the sextant. After the *Andrea Doria* accident, the United Kingdom took action to increase the requirements for a deck officer's license to include submission of a Certificate of Proficiency as a radar observer. It is an important step forward to require that deck officers demonstrate ability to make use of perhaps the most useful aid to safety of navigation ever devised. Every maritime nation should institute a similar program."

MARINE OUTLOOK BRIGHT FOR 1957

All indications point to 1957 as a year of full employment in the merchant marine and allied industries, profitable operation of merchant ships, expansion of American-flag service to shippers, and an increase of shipbuilding in the United States, Clarence G. Morse, Chairman of the Federal Maritime Board and Maritime Administration, U. S. Department of Commerce, said in a year-end statement.

The tempo of activity in maritime affairs was heightened near the end of 1956 by the crisis arising from the closure of the Suez Canal and because of the international situation in general, the Chairman said.

Emphasizing the additional requirements placed upon the American merchant marine, Mr. Morse cited the fact that 82 dry cargo ships and 18 tankers had been broken out of the National Defense Reserve Fleet to meet the need for tonnage under the American flag over and above the active privately owned fleet, which by the end of the year numbered 1,030 ships of all types.

"This is another, and the latest, demonstration of the value of our Reserve Fleet," he said. "But it also points up the need for a modernized and balanced active fleet under private ownership and operation to strengthen our national security through improved foreign trade and defense capabilities."

He pointed out that the increased need for additional tanker, passenger, dry cargo, and specialized types of ships has come at a time when our merchant marine is in the early stages of an orderly replacement program.

"During this period, pending the actual deliveries of new ships now on order or under construction, we have taken up the slack in two directions," Mr. Morse said. "We have placed in operation all of the Mariner ships except one now up for sale. Also, we have been able to turn to the Reserve Fleet for the temporary use under charter of dry cargo ships suitable to meet emergency needs arising from increased foreign-aid programs and to help meet the fuel needs of Western Europe.

"The FMB feels that it has exercised caution and discretion in allowing for the use of reserve ships to the extent of filling temporary needs, but at the same time not in such numbers as to disrupt the world market by overtonnaging," he said.

SHIPS TOO OLD

Stressing the fact that we must not become complacent concerning our maritime resources, Mr. Morse warned that the majority of our active ships, as well as those in reserve, are reaching the period of obsolescence, are too slow in speed, and are thus in need of replacement.

"The need for new merchant ships, particularly tankers, is more obvious than ever before," he said.

The response of the industry has been favorable, on the whole, the Administrator said, but he urged the steamship lines to step up the pace of their replacement plans.

The major obstruction at present is the shortage of ship steel, Mr. Morse declared, stating that he is continuing his efforts in cooperation with other Government agencies to channel enough steel of the type needed to overcome the current and expected "slippage" in this essential material.

Despite the lack of steel, the shipbuilding program now in the yards and on order, plus the amount of new construction expected to result from various agreements between shipping lines and the Government, amounts to the greatest such program in the peacetime history of the Nation, the Administrator said.

"There are now 65 ships under construction or on order in the Nation's shipyards," Mr. Morse said. "Orders for some 60 new ships, of which 58 are tankers, are expected shortly as a result of approvals granted in principle permitting the transfer of older tonnage to foreign registry, or the building of some vessels for foreign registry, with both new and transferred ships remaining under 'effective U. S. control'."

This program alone represents a total possible expenditure of some $715 million.

LONG-RANGE CONTRACTS

In addition, 12 shipping companies holding operating differential subsidy contracts with the Government have full or partial obligations to construct a total of 172 vessels as future replacements in their fleets. Other long-range contracts in the negotiation stage are expected to provide for construction of 100 more cargo and combination vessels.

Progress has been made in providing new passenger capacity. Under construction at the present time are two new ships for Moore-McCormack and two for Grace Line. Two Mariners have been converted for passenger service by Oceanic Steamship Co. One is in service, the other will be in January. Two older vessels are also being converted for passenger service, the *Matsonia* of Matson Navigation Co., and the *Leilani* of Hawaiian Steamship Co. The last one of the Mariners, now up for sale, is also expected to be converted for transatlantic passenger service. These nine ships will add capacity for 4,800 passengers to the fleet and improve the troop-carrying potential in event of an emergency.

Although no new contracts for dry cargo ships have been placed and none is under construction at this time for private operation, the purchase by private lines of 28 of the 20-knot Mariner ships has provided 360,000 deadweight tons of additional cargo-carrying capacity to the regular fleet. The early months of 1957 should see new designs approved and contracts placed for new freighters.

Additional ocean transportation service on essential United States foreign trade routes is expected under operating-differential subsidy agreements, Mr. Morse said. In February 1956, the ocean routes between the Great Lakes and St. Lawrence River ports of the United States and ports of Western Europe were declared essential to the trade and economy of the Nation, and the size and type of ships and frequency of service required was determined by the Maritime Administration. Subsequently, applications to serve this new route were filed by Isbrandtsen Co., Inc., T. J. McCarthy SS. Co., and United States Lines Co. Hearings under section 605 (c) of the Merchant Marine Act have been authorized on these applications but have been postponed pending preliminary recommendations under section 601 (a). In addition, Grace Line, Inc., has applied for a redefinition of Trade Route 4 (United States Atlantic ports to Carribbean) to include Great Lakes ports. All these lines have proposed chartering Government-owned N3 cargo vessels for temporary service pending opening of the St. Lawrence Seaway to deep-draft ships.

OPERATING SUBSIDIES

Other applications for operating subsidy are pending from Isbrandtsen for round-the-world eastbound service, from States Marine Corporation for a tri-continent service, from States Steamship Company for Trade Routes 29 and 30 (Pacific coast to Far East), and from Matson-Oriental Line, Inc., for Trade Route 12 (United States Atlantic to Far East). These applications are now in various stages of processing by the Federal Maritime Board and Maritime Administration. Officials of Waterman Steamship Corp. and Isthmian SS. Company have also announced their intention to apply for operating subsidies. This

means that almost all of the large United States berth operators either hold operating-differential subsidy contracts, or have applied or are planning to apply.

The year past has seen remarkable strides in experimental and development work trending toward new ship and machinery design, the Maritime Administrator said. Three repowered Liberty ships, two with hull changes and one with new cargo gear, are at sea today. Their performance, as compared with conventional ships, is being analyzed in both commercial operations and those of a military lift type.

"What we are learning from the conversion and operation of these ships, and the adaptation of new machinery which propels them, will greatly influence new commercial ships design and provide essential data for mobilization planning," Mr. Morse said.

One of the new ships is propelled by an open-cycle gas turbine and a controllable-pitch propeller. This vessel, the GTS (Gas Turbine Ship) *John Sergeant*, created considerable interest in technical and shipping circles both here and among other maritime nations. Nearing completion is a second gas turbine ship, whose plant will use a free piston compressor in conjunction with the turbine. Sea trials are expected during the first part of 1957. Also during the year, a third gas turbine plant will be installed in a modified Liberty ship of a type which will be studied as to its application in connection with a nuclear reactor.

NUCLEAR-POWERED SHIP

The Maritime Administration and the Atomic Energy Commission, in a joint project, are well advanced in the preliminary stages of work toward production of a nuclear-powered merchant ship, under legislation passed by the Congress during 1956 and as directed by President Eisenhower.

It is expected that a contract for design and working plans will be placed shortly for the ship itself. Proposals of a manufacturer have been selected for the negotiation of a contract to construct the nuclear reactor.

Because of the swiftly developing technology in the field, the joint project of the two Government agencies includes a number of study contracts now underway to keep abreast of these developments in their relation to the application of nuclear power to future merchant ships.

"While we have made sound and significant gains in 1956, it would be wrong to fancy that the problems faeing American shipping have been solved," Mr. Morse said. "The tasks that lie ahead are at least equal to those we have met in the past. The American merchant marine must be encouraged to greater reliance upon its own resources to meet its problems, with the Government assuming a role only where essentiality of national interest dictates participation."

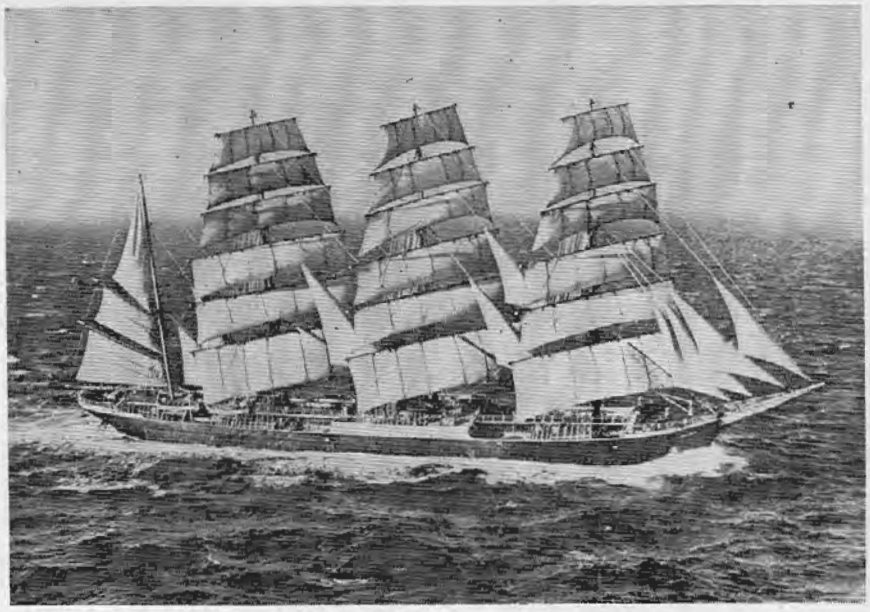


Figure 1.

1957 OUTLOOK

"We have a building program which is the greatest in the peacetime history of our Nation, but there are still wide gaps in the development of a truly well-balanced fleet. We are doing fairly well in the replacement of passenger ships and tankers, and expect a sound and continued construction of new cargo ships. But we are not building ore carriers to any extent, nor are there signs of developing the tramp segment of our fleet."

The Administrator further said that although there is a possibility of the presently rising coal export program reaching a figure of some 100 million tons by 1960, no new conceptions have been announced for specialized ships for this lift.

In relation to shipboard labor, Mr. Morse said: "We must be watchful in the construction of bigger, faster vessels, just as with the advent of automation in other fields, that we also tackle the problem of finding employment for the trained crews from vessels displaced by new giant-sized ships. The only real solution lies in increasing the entire merchant fleet under the American flag."

SAIL HO!

Although sailing vessels seldom may be seen on an ocean trade route, a reminder is issued to all mariners that most maritime nations use "wind-driven" ships for training, and two—the *Pamir* and *Passat*—are in regular service from the River Plate to German ports.

These vessels, both four-masted barks, are combination school and trade ships carrying coal outbound and grain homebound. They are over 300 feet in length, steel hulled, and manned with cadets under officer supervision. (*See Figure 1 above.*)

Several occurrences reported by these vessels have convinced the German authorities that some modern watch officers have never encountered a sailing ship under way and fail to recognize it at night, or by its signals in thick weather. As a result they have issued a special warning to ships of German registry to exercise strict compliance with Regulations for Preventing Collisions at Sea, 1948.

The Rules of the Road are clearly spoken on the lights, steering and sailing rules, and fog signals for sailing vessels. The following are quoted from Coast Guard pamphlet CG–169, Rules to Prevent Collisions:

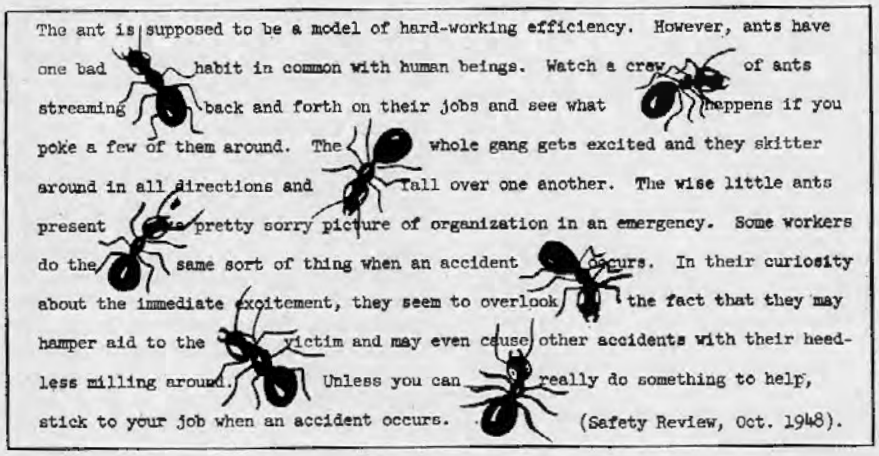
Rule 5 (a) A sailing vessel under way and any vessel or seaplane being towed shall carry the same lights as are prescribed by Rule 2 for a power-driven vessel or a seaplane underway, respectively, with the exception of the white lights specified therein, which they shall never carry. They shall also carry stern lights as specified in Rule 10, * * *.

JUST EMERGING from the smoke is the stern of the SS *African Grove* during the height of the recent Luckenbach pier fire in New York. See Traditions of the Sea in this issue for details. The SS *African Lightning* is seen in the foreground after being towed to safety. Photo courtesy of the *News, New York's Picture Newspaper.*

In short, red and green sidelights and a stern light only. Inasmuch as sidelights must only be visible for a distance of two miles, shipmasters should caution watch officers to take immediate and positive action if an unexpected red or green light should suddenly appear ahead of their vessel.

Rule 15 (*c*) (*iii*). A sailing vessel under way shall sound, at intervals of not more than 1 minute, when on the starboard tack one blast, when on the port tack two blasts in succession, and when with the wind abaft the beam three blasts in succession.

Rule 20 (*a*) When a power-driven vessel and a sailing vessel are proceeding in such directions as to involve risk of collision, except as provided in Rules 24 and 26, the power-driven vessel shall keep out of the way of the sailing vessel.



"ANT PSYCHOLOGY: When in danger or in doubt, run in circles, scream and shout." That seems to be thinking of these ants in an emergency. Material courtesy Charles Hagerty, Safety Engineer, Camp Pendleton, Calif., from Safety Review.

TRADITIONS OF THE SEA

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

One of the names which has a distinguished place on this roll of honor is that of CAPTAIN JOHN A. BASSETT, a senior Moran Towing and Transportation company pilot.

CAPTAIN BASSETT, who helped plant the artificial breakwaters and piers on the Normandy beachhead in World War II, was en route home from the 29th street pier, Brooklyn, New York, when the tremendous fire recently engulfed the Luckenbach pier at 35th street.

A summary of the incident follows:

Spun around and nearly knocked down by the blast, he raced through the burning pier and saw the almost solid blanket of smoke across the bow of the *Farrell Lines* freighter *African Grove* tied up across the slip from the blaze. Hurrying up the gangway and into the wheelhouse, CAPTAIN BASSETT learned from the chief engineer there was enough steam to move the ship.

CAPTAIN C. W. SWENSON, *Farrell* assistant port captain, cut the lines aft, and LEO DACKOWSKI, *Universal Stevedoring* official, chopped those forward. Although injured in the blast, CAPTAIN L. A. RENEHAN, *Farrell Lines* marine superintendent, stood by on the bridge to assist. CAPTAIN BASSETT took the wheel and handled the engineroom telegraph. Ringing for slow speed astern, he started to jockey the freighter out of the slip without a full crew, without a tug, and with no visibility.

With crew members spraying the decks and superstructure on the starboard side toward the fire, CAPTAIN BASSETT eased the big ship into the stream where the *Doris Moran* put a line on the vessel and towed her to a safe anchorage.

CAPTAIN JAMES C. STILLWAGGON of the tug *Valmorac* was witness to CAPTAIN BASSETT'S good seamanship and disregard for danger. He later said: "When the ship was clear of the flames and finally safe, I saw CAPTAIN RENEHAN walk over to CAPTAIN BASSETT and put his arm around him, and shake his hand. It was a simple gesture, but the greatest compliment for a magnificent job."

MERCHANT MARINE PERSONNEL STATISTICS

MERCHANT MARINE OFFICER LICENSES ISSUED

QUARTER ENDING 31 DECEMBER 1956

DECK

Grade	Original	Renewal
Master:		
Ocean	67	578
Coastwise	1	4
Great Lakes	----	----
B. S. & L.	----	1
Rivers	2	6
Radio officer licenses issued	24	72
Chief mate:		
Ocean	37	140
Coastwise	----	----
Mate:		
Great Lakes	----	----
B. S. & L.	----	----
Rivers	----	----
Second mate:		
Ocean	43	99
Coastwise	----	----
Third mate:		
Ocean	32	95
Coastwise	----	----
Pilots:		
Great Lakes	----	----
B. S. & L.	203	79
Rivers	11	5
Master: Uninspected Vessels	3	1
Mate: Uninspected Vessels	6	1
Total	429	1,081
Grand total	1,510	

ENGINEER

STEAM		
Chief engineer:		
Unlimited	36	593
Limited	8	131
First assistant engineer:		
Unlimited	36	182
Limited	1	8
Second assistant engineer:		
Unlimited	32	203
Limited	----	----
Third assistant engineer:		
Unlimited	39	234
Limited	----	5
MOTOR		
Chief engineer:		
Unlimited	4	55
Limited	13	48
MOTOR—continued		
First assistant engineer:		
Unlimited	4	8
Limited	1	----
Second assistant engineer:		
Unlimited	----	1
Limited	----	1
Third assistant engineer:		
Unlimited	6	2
Limited	3	----
Chief engineer: Uninspected Vessels	----	1
Assistant Engineer: Uninspected Vessels	----	----
Total	183	1,472
Grand total	1,655	

WAIVER OF MANNING REQUIREMENTS

Waivers	Atlantic coast	Gulf coast	Pacific coast	Great Lakes	Total
Deck officers substituted for higher ratings	----	----	----	6	6
Engineer officers substituted for higher ratings	----	----	1	30	31
O. S. for A. B	1	----	4	2	7
Wiper or coalpassers for QMED	1	1	----	3	5
Total waivers	2	1	5	41	49
Number of vessels	1	1	5	36	43

INVESTIGATING UNITS

Coast Guard Merchant Marine Investigating Units and Merchant Marine Details investigated a total of 3,297 cases during the 4th quarter of 1956. From this number, hearings before Examiners resulted involving 62 officers and 244 unlicensed men. In the case of officers, 3 licenses were revoked, 8 were suspended without probation, 13 were suspended with probation granted, 8 licenses were voluntarily surrendered, 8 cases were dismissed after hearing, and 7 hearings were closed with admonition. Of the unlicensed personnel, 37 documents were revoked, 25 were suspended without probation, 86 were suspended with probation granted, 164 documents were voluntarily surrendered, 17 hearings were closed with admonition, and 19 cases were dismissed after hearing.

ORIGINAL SEAMEN'S DOCUMENTS ISSUED

Type of document	Atlantic coast	Gulf coast	Pacific coast	Great Lakes and rivers	Total
Staff officer	37	8	21	1	67
Continuous discharge book	2	25	----	2	29
Merchant mariner's documents	1,337	601	717	1,112	3,767
AB any waters unlimited	99	30	57	17	203
AB any waters, 12 months	33	21	30	82	166
AB Great Lakes, 18 months	----	----	1	26	27
AB tugs and towboats, any waters	----	----	----	----	----
AB bays and sounds	----	----	----	----	----
AB seagoing barges	----	----	----	----	----
Lifeboatman	90	17	121	21	249
QMED	132	41	63	125	361
Radio operators	9	6	6	19	40
Certificate of service	1,309	609	712	1,015	3,645
Tankerman	21	18	5	81	125
Total	3,069	1,376	1,733	2,501	8,679

NOTE.—The last 11 categories indicate number of endorsements made on United States merchant mariner's documents.

APPENDIX

AMENDMENTS TO REGULATIONS

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

DEPARTMENT OF THE TREASURY

United States Coast Guard

[CGFR 57-3]

COAST GUARD PORT SECURITY CARDS

The United States Coast Guard is authorized to issue Coast Guard Port Security Cards as one means of identification of persons regularly employed on vessels or on waterfront facilities or of persons having regular public or private business connected with the operation, maintenance, or administration of vessels, their cargoes, or waterfront facilities. The practice is to limit the validity of these Coast Guard Port Security Cards to a definite period of time from the date of issuance. The Coast Guard Port Security Cards issued prior to October 1952 bear a date of expiration two years after the date of issuance. Coast Guard Port Security Cards issued between October 1952 and January 1954 indicate a period of validity of four years from the date of issuance. The Coast Guard Port Security Cards issued between January 1954 and January 1957 bear a validity period of six years from the date of issuance thereof. It is not deemed appropriate or necessary to require the rescreening of holders of Coast Guard Port Security Cards and the reissuance of such cards at this time.

By virtue of the authority vested in me as Commandant, United States Coast Guard, by 33 CFR 6.10-7 in Executive Order 10173, as amended by Executive Orders 10277 and 10352 (15 F. R. 7005, 7007, 7008, 16 F. R. 7537, 7538, 17 F. R. 4607), notice is given to holders of Coast Guard Port Security Cards (Form CG-2514) that the period of validity of such cards, unless sooner surrendered or canceled by proper authority, will be for a period of eight years from the date of issuance thereof instead of the various periods as indicated on the reverse of the cards.

This document supersedes Coast Guard Document CGFR 53-62 entitled

"Coast Guard Port Security Cards", dated January 11, 1954, and published January 16, 1954 (19 F. R. 306).

Dated: January 22, 1957.

[SEAL] J. A. HIRSHFIELD,
Rear Admiral, U. S. Coast Guard,
Acting Commandant.

[F. R. Doc. 57-661; Filed, Jan. 28, 1957; 8:50 a. m.]

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 December 4, 1956 (CGFR 56-48)-(CGFR 56-50). Copies of these documents may be obtained from the Superintendent of Documents, Washington 25, D. C.]

ARTICLES OF SHIPS' STORES AND SUPPLIES

Articles of ships' stores and supplies certificated from 1 January to 31 January 1957, inclusive, for use on board vessels in accordance with the provisions of Part 147 of the regulations governing "Explosives or Other Dangerous Articles on Board Vessels" are as follows:

CERTIFIED

West Disinfecting Co., 42-16 West St., Long Island City 1, N. Y., Certificate No. 289, dated 2 January 1957, WESCODYNE.

Dakoline Chemical Co., Inc., 357 Atlantic Ave., Brooklyn 17, N. Y., Certificate No. 290, dated 22 January 1957, DYN-A-KLENE #700.

The Daniel Co., 17 Bolt St., Lowell, Mass., Certificate No. 291, dated 22 January 1957, DANSOLVE-36.

FUSIBLE PLUGS

The regulations prescribed in Subpart 162.014, Subchapter Q, Specifications, require that manufacturers submit samples from each heat of fusible plugs for test prior to plugs manufactured from the heat being used on vessels subject to inspection by the Coast Guard. A list of approved heats which have been tested and found acceptable during the period from 15 November 1956 to 15 December 1956 is as follows:

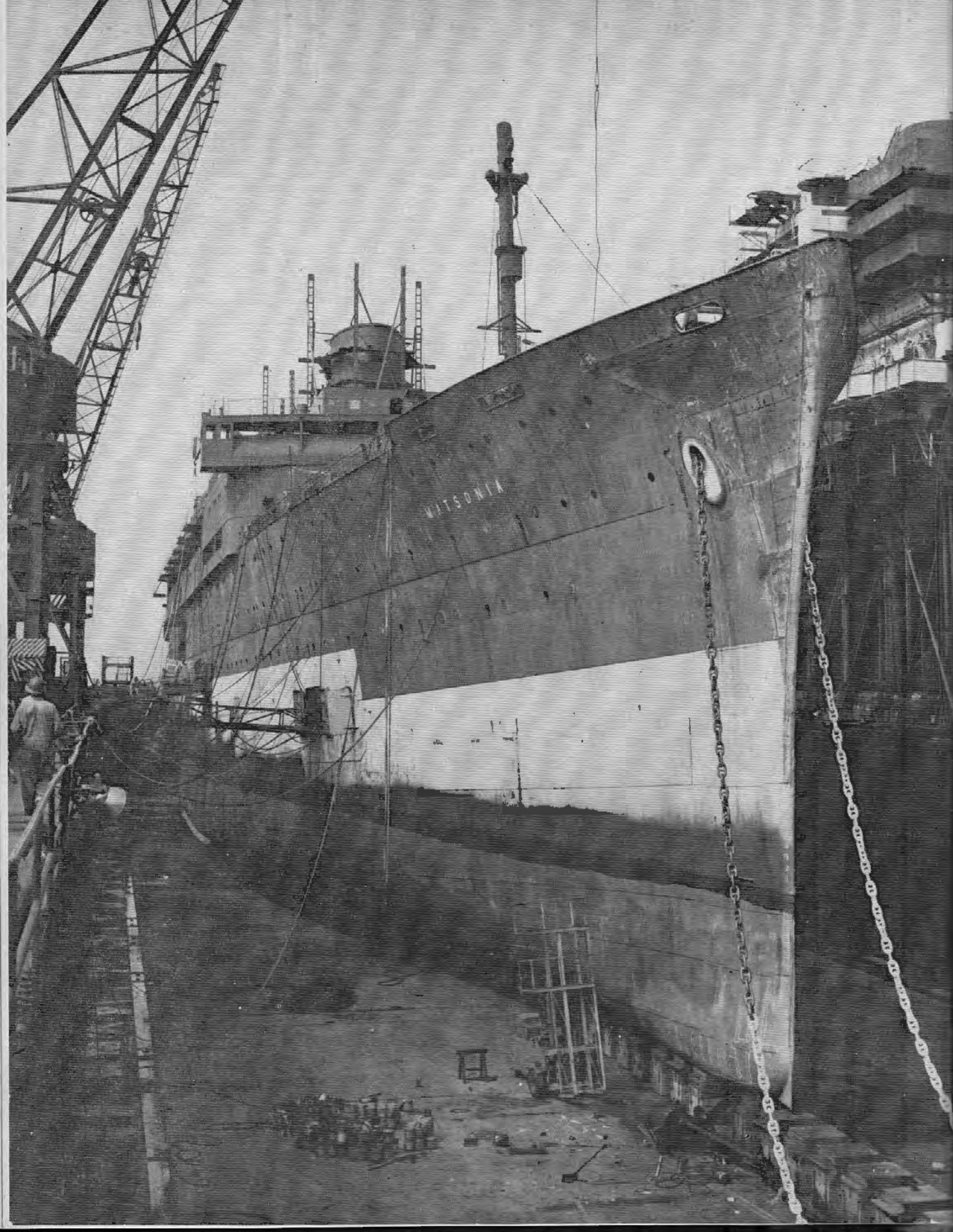
The Lunkenheimer Co., Cincinnati 14, Ohio. Heat Nos. 550, 551, and 552.

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 31 December 1956. 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	15,805
	(1) Portland, Maine	9,392
	(2) St. Albans	945
	(5) Providence	4,758
	Total	30,900
2 (St. Louis)	(45) St. Louis	10,927
	(12) Pittsburgh	2,370
	(34) Pembina	131
	(35) Minneapolis	2,602
	(40) Indianapolis	5,551
	(42) Louisville	2,974
	(43) Memphis (part)	5,762
	(46) Omaha	359
	(47) Denver	31
	Total	30,707
3 (New York)	(10) New York	49,031
	(6) Bridgeport	9,461
	(11) Philadelphia	20,738
	Total	79,230
5 (Norfolk)	(14) Norfolk	16,487
	(13) Baltimore	23,717
	(15) Wilmington, N. C	8,548
	Total	48,752
7 (Miami)	(18) Tampa (part)	25,453
	(16) Charleston	1,531
	(17) Savannah	2,389
	(49) San Juan	469
	(51) St. Thomas	121
	Total	29,963
8 (New Orleans)	(20) New Orleans	21,526
	(18) Tampa (part)	561
	(19) Mobile	8,288
	(21) Port Arthur	4,500
	(22) Galveston	9,565
	(23) Laredo	1,628
	(24) El Paso	21
	(43) Memphis (part)	65
	Total	46,214
9 (Cleveland)	(41) Cleveland	10,193
	(7) Ogdensburg	2,800
	(8) Rochester	5,905
	(9) Buffalo	4,284
	(36) Duluth	2,675
	(37) Milwaukee	4,070
	(38) Detroit	22,275
	(39) Chicago	8,719
	Total	60,921
11 (Long Beach)	(27) Los Angeles	13,069
	(25) San Diego	2,367
	(26) Nogales	145
	Total	15,581
12 (San Francisco)	(28) San Francisco	14,807
13 (Seattle)	(30) Seattle	20,876
	(29) Portland, Oreg	8,819
	(33) Great Falls	615
	Total	30,310
14 (Honolulu)	(32) Honolulu	3,704
17 (Juneau)	(31) Juneau	7,989
	Grand total	399,078

U. S. GOVERNMENT PRINTING OFFICE: 1957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