

MERCHANT MARINE INSPECTION: A MAJOR FUNCTION OF THE COAST GUARD

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FOR approximately six years now, the United States Coast Guard has administered certain functions commonly known as "merchant marine inspection." Compared to the 157 year old history of the Coast Guard, the administration of these functions is quite new. But, nevertheless, it comprises activities which form a very important part of Coast Guard work today.

Recent congressional appropriations hearings have summarized the significant functions of the Coast Guard as: (1) search and rescue, (2) aids to navigation, and (3) marine inspection. Functionally speaking, therefore, merchant marine inspection covers *one-third* of the active peacetime Coast Guard.

Although new to the Coast Guard, merchant marine inspection has an origin dating back to 1838, when an act of Congress legislated the "better security of passengers on board vessels propelled in whole or in part by steam." Since that time, the Steamboat Inspection Service (as it was then known) has grown into an administrative organization with a vast system of laws and regulations designed to prevent or minimize the occurrence of marine accidents and irregularities. When this Service (later called the Bureau of Marine Inspection and Navigation) was transferred to the Coast Guard on temporary wartime basis in 1942, it had acquired its own personnel, traditions, concepts, policies and procedures. It was, and still is, unavoidable that these matters would have a modificatory effect upon corresponding matters in the Coast Guard.

Six years is scarcely a sufficient period (especially considering that the first four years were "temporary") for two Federal Services, each more than a century old, to effectuate a complete integration of their activities. When this is finally accomplished it is believed that marine inspection will become a leading, if not predominant, function in the organizational structure of the Coast

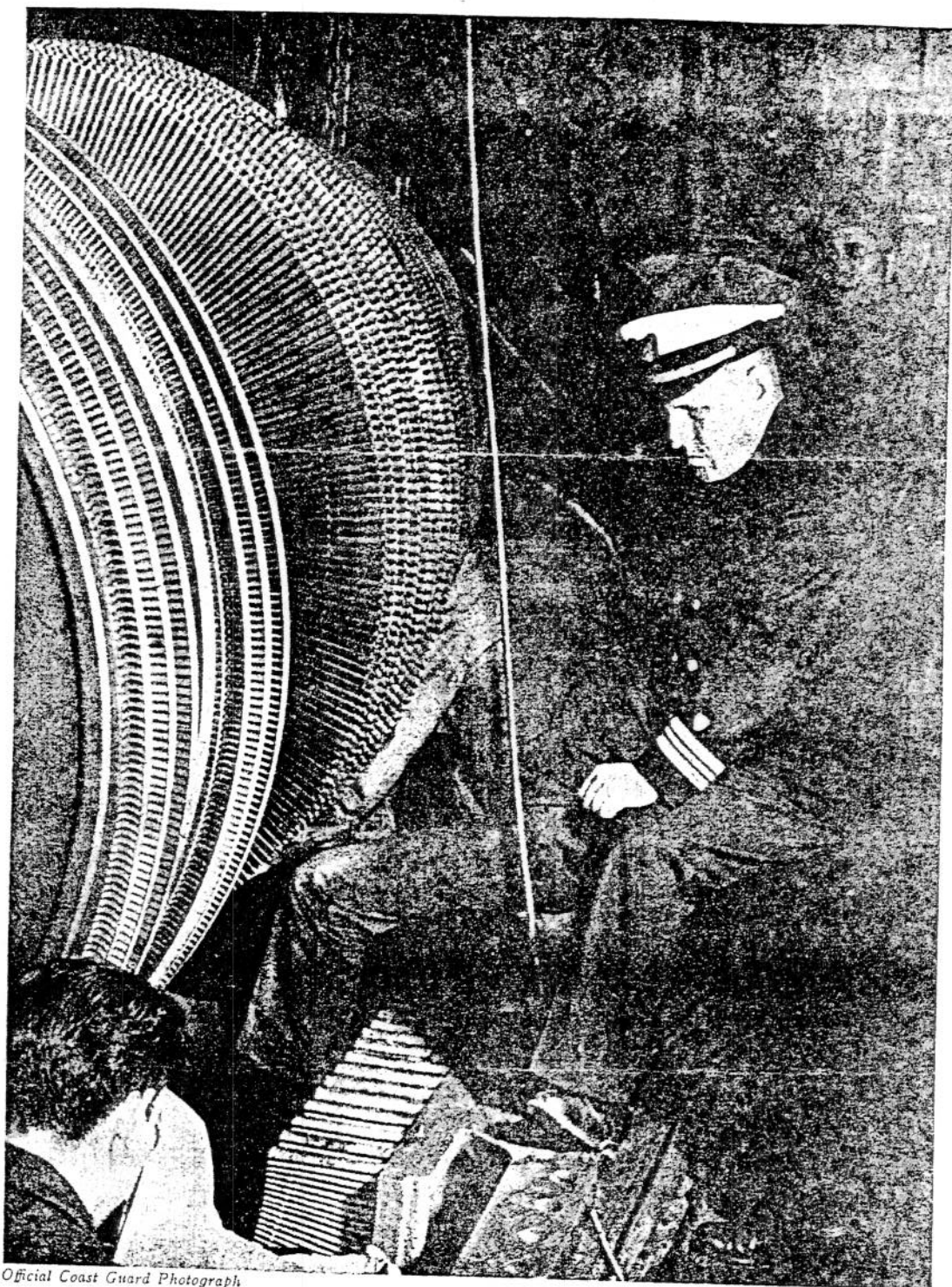
Guard. This will be particularly true when it is recognized that inspectional activities necessarily interfuse the Coast Guard with the economics of merchant vessel operation.

In view of the importance of marine inspection to the Coast Guard and also in view of the fact that of the total number of personnel performing such duties *less than one-sixth* are original Coast Guard personnel, it is essential that there be a clear understanding, both within the Coast Guard and without, regarding the full nature and scope of merchant marine inspection. This understanding is even more desirable when the national defense is under consideration. As an American merchant marine becomes more and more vital to our national safety, so will the importance of marine inspection increase to make that merchant marine reliable and efficient.

As a consequence, it is the purpose of this writing to facilitate a better understanding of the Coast Guard, and, in particular, a better understanding of Coast Guard marine inspection functions. The accomplishment of this purpose is undertaken in three parts—by means of definition, background, and description of the functions as they are now performed.

The method of presentation and the views expressed herein are, of course, personal. Neither necessarily reflects the official position of the Coast Guard. While every reasonable effort has been made to check the

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Official Coast Guard Photograph

A PASSENGER LINER'S MAIN TURBINE IS INSPECTED

The work of the former Bureau of Marine Inspection and Navigation is now one of the three major functions of the U. S. Coast Guard, to which it was transferred on a temporary wartime basis in 1942.

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WHAT IS MERCHANT MARINE INSPECTION?

To gain an initial understanding of merchant marine inspection, we desire a practical definition. Perhaps as complete a definition as any is that found in Section 101 of the President's Reorganization Plan No. 3, 1946. This Plan made permanent the temporary transfer of certain functions of the former Bureau of Marine Inspection and Navigation to the Coast Guard in 1942. Section 101 is paraphrased as follows:

There are hereby transferred to the Commandant, U. S. Coast Guard, those functions which pertain to (1) approval of plans for the construction, repair and alteration of vessels; (2) approval of materials, equipment and appliances; (3) classification of vessels; (4) inspection of vessels and their equipment; (5) issuance of certificates of inspection, and of permits indicating the approval of vessels for operations which may be hazardous to life or property; (6) administration of load line requirements; (7) licensing and certifying of officers, pilots and seamen; (8) suspension and revocation of licenses and certificates; (9) investigation of marine casualties; (10) administration of manning and citizenship requirements, and requirements for the mustering and drilling of crews, and control of logbooks; (11) shipment, discharge, protection and welfare of merchant seamen; (12) promulgation and administration of regulations to prevent collisions (Pilot Rules) and rules for lights and signals on bridges; (13) numbering of undocumented vessels; (14) prescription and administration of regulations for outfitting and operation of motorboats, including licensing of motorboat operators; and (15) remission and mitigation of fines, penalties and forfeitures incurred under the laws governing these functions.

The functions of marine inspection are primarily for the protection of the passengers and crew on board American merchant vessels. But not all such vessels are inspected. Some are subject to inspection; others are not—depending on the class of vessel, gross tonnage, area of operations, and other conditions. The difference between an inspected and uninspected vessel is sometimes involved. When it is, clarification is sought through legal interpretations. Foreign pas-

senger vessels carrying passengers from any port of the United States are subject to inspection if the countries to which they belong do not have inspection laws approximating our own. The inspection of foreign passenger vessels is narrowed for signatory nations to international agreements. Load lines are prescribed for all ships of 150 gross tons and over, excepting ships of war, fishing vessels, yachts, and ships without cargo or passengers, leaving U.S. ports on international voyages.

Public vessels, or vessels owned by the U.S. Government and operated in the public interest, are exempt from statutory inspection unless so requested by the head of an agency, as for example, seaworthy inspections of merchant-type vessels of the U.S. Army. Vessels owned or operated by the U.S. Maritime Commission, by law, are subject to all inspectional provisions. Navy and Coast Guard vessels are not "marine inspected."

Each of the enumerated functions of marine inspection is somewhat broad. There is a diversity of activities within each function such that no one procedure or set of requirements is universally applicable. There are all types and sizes of merchant vessels, operating under many different conditions and over various routes and waters. Each vessel has certain inspectional features not necessarily similar to those of every other vessel. This diversity of inspectional activity within each function is best illustrated by the numerous inspections of vessels and the licensing and certifying of officers and seamen.

A merchant vessel inspection ordinarily consists of examining the hull structure and decks, boilers and appurtenances, deck and engine room machinery, lifesaving equipment (boats, rafts, floats, life-preservers, etc.), fire apparatus (pumps, hose, hydrants, portable extinguishers, etc.) pilot house equipment, steering apparatus, crew and passenger quarters, vessel documents and placards, and other items. Such inspection is performed in the shipyard during original construction and annually each year thereafter. Quarterly reinspections are made of passenger vessels. When a vessel goes in dry-dock its bottom is inspected. When it is damaged through collision, grounding, fire

or other reason, its damage is surveyed and its repairs are inspected.

The inspection rules vary for each type of vessel and area of operation. An inland ferry does not meet the same requirements as an ocean passenger vessel. A tanker has different inspection requirements from a freight or dry cargo vessel. The requirements for a seagoing barge differ from those of a tugboat, which in turn differ from those of a motorboat. A foreign passenger vessel has one set of requirements, a fire boat, dredge, and water taxi each has another. The inspection rules on the Great Lakes vary from those on the oceans and coastal waters. Lake, bay and sound vessels have a set of rules different from those of river vessels. Within each set of rules, gross tonnage, length, or horsepower differences between vessels of the same type may make certain sections applicable to one vessel and not to another. The date a vessel was built may also cause variation in applicable sections of the inspection requirements. In addition to this, the rules themselves are subject to change from time to time by reason of amendments, revisions, clarifications, deletions, and so on. All of this activity is covered in section 101 of Reorganization Plan No. 3 as simply "inspection of vessels and their equipment."

Licensing and certificating is no less involved than vessel inspection. Licenses are issued to merchant marine officers; certificates are issued to merchant seamen. A merchant mariner's document is issued to both for purposes of identification. Engineer licenses are based on horsepower; deck licenses are based on gross tonnage and waters. Licenses are issued for a 5 year period; certificates are issued for an indefinite period. Both may be revoked or suspended. Licenses are conditioned upon a satisfactory written professional examination, certificates upon a satisfactory written or oral examination. Before either type of examination, each applicant must meet certain minimum qualifications with respect to character, health, and sea service. Sea experience qualifications vary for the type of license (or certificate) desired, and the tonnage (or horsepower) and route desired. A similar variation in professional knowledge applies to the examinations themselves. Of-

ficers are given examinations commensurate with the grades of master, mate, engineer or pilot. Seamen are examined as A.B.'s (able seamen), Q.M.E.D.'s (qualified member of the engineer department), lifeboatmen, tankermen, and other ratings. Pursers and food handlers are certificated but are not professionally examined. The questions and problems on examinations for corresponding grades and ratings on ocean, Great Lakes, and inland vessels are, of necessity, different. The number of re-examinations is unrestricted, except for specified time intervals. Licenses may be renewed, raised or extended in route, horsepower, and tonnage. Certificates may be endorsed to cover a complete list of holder qualifications. As documents may be lost, stolen, or destroyed, there are separate procedures for restoration. And so on. These activities are referred to as "licensing and certificating"—just one-fifteenth of the over-all functional activity of marine inspection.

If, by this time, the reader has come to some partial conclusion that marine inspection cannot be defined with dictionary briefness, he has not been misled. The scope of marine inspection is quite extensive although it can be defined in one sentence in terms of its purpose and method: *marine inspection comprises those activities which seek to prevent or minimize mishaps by means of a coordinated system of laws and regulations affecting Merchant Marine operations.* This system was "piece-mealed" in a reluctant attempt to instill responsibility in those sectors of private shipping management which clearly displayed a lack of responsibility for the loss of life and property of others.

There are also other Federal laws and regulations which affect private shipping management. Many of them are not within the jurisdiction of the Coast Guard, as the Coast Guard is primarily concerned with those matters influencing marine safety. Other government bodies are interested in customs, commerce, communications, health, agriculture, taxation, and other matters which are not direct factors in marine safety. The multiplicity of other government regulatory bodies is a growing grievance to the marine transport industry.

HISTORY OF MARINE INSPECTION

It has been indicated, by reference to the 1838 origin, that the growth of laws and regulations governing marine inspection has been no sudden process. The system grew by a patch-work procedure of "plugging the leaks as they appeared." The laws were in the form of remedial action taken after lessons were learned the hard way through repeated marine disasters. Such laws were usually in response to the demands of an excited public after the loss of many lives. As a result, the laws were irregular in timing and were more drastic than ordinarily necessary. In recent years, however, the approach to preventive marine safety has been based upon cooperative discussions by affected groups both before and after marine mishaps.

In the early days of our shipping history, wooden sailing vessels predominated and marine hazards were largely external in character—storms, fog, reefs, shoals, and the like. The effect of some of these hazards were at first lessened by an embryo system of aids to navigation (12 lighthouses on the Atlantic coast in 1789). With the advent of steam in the opening years of the nineteenth century, internal risks, due to the harnessing of this new power in crude machinery tended by unskilled engineers, led to an increasingly large number of serious disasters. By the year 1832, 14 per cent of the steam vessels in operation were destroyed by explosions and more than 1,000 persons were killed. In 1838 the steamboat *Moselle* blew up on the Ohio River near Cincinnati, killing 100 persons. In the same year, the steamboat *Pulaski* blew up off North Carolina with 140 lost; the steamboat *Washington* burned on Lake Erie with 50 lost, and the steamboat *Gen. Brown* blew up on the Mississippi River at Helena, Arkansas, with 60 killed. Following these and other casualties, Congress enacted legislation to require the annual inspections of hulls and boilers, the employment of experienced engineers, and the provision of lifeboats, fire pumps, hose, and other safety equipment.

The administration of the 1838 requirements was vested in the Federal District Courts with power to appoint hull and boiler inspectors. About the only result of these requirements was to direct attention to the

importance of marine inspection rather than to the thoroughness of it. For an authorized fee, a vessel was inspected. For another fee, a license was issued. The District Court arrangement proved unsatisfactory, and in 1852 (the "Steamboat Act") the Steamboat Inspection Service was organized under nine "supervising inspectors," each of whom appointed local inspectors within his own district. Despite some gains in marine safety, an approximate average loss of life of 700 per year continued, and in 1871 a further reorganization established an office of Supervising Inspector General and provided for an annual meeting of a Board of Supervising Inspectors empowered to establish rules and regulations within the Congressional statutes. In 1885, statutory inspectional fees were discontinued.

By subsequent Congressional action the scope of the safety laws and regulations was broadened to cover more detailed hull and boiler construction standards, lifesaving and firefighting equipment, hazardous cargoes, and the licensing and certificating of marine personnel, while the classes of vessels subject to inspection were steadily increased. The burning of the excursion steamer *General Slocum* in the East River, New York, on June 15, 1904, with the loss of 1,021 lives resulted in legislation for additional measures for the prevention and extinguishing of fire and more stringent supervision of lifesaving equipment (iron bars were found in the life preservers). The overturning of the steamer *Eastland* in the Chicago River in 1915 with a loss of 812 persons led to a recommendation that naval architects pass on the stability and construction of all passenger vessels over 100 gross tons. Following the sinking of the *Titanic* after collision with an iceberg and the loss of 1,517 lives, an international conference on safety of life at sea was held at London 1913-1914. This conference embodied recommendations regarding the number, construction, and capacity of lifeboats, number of davits, instructions for mustering passengers and crew, and type of life-preservers. Many of these recommendations were incorporated in the Seaman's Act of 1915. Another international convention was held in 1929 which resulted in detailed recommendations as to water-

tight subdivision and stability testing (of passenger ships), lifeboats and buoyant apparatus, line-throwing appliances, fitting of radio installations, meteorological services, distress procedures, and issuance of safety certificates. In 1930, the International Load Line Convention closed with agreements for load lines and weather zones to prevent overloading of vessels.

On June 30, 1932, the Steamboat Inspection Service and the Bureau of Navigation (which enforced all navigation laws not specifically invested in other agencies, including those relating to the hiring, discharge, and conduct of seamen) were consolidated as the Bureau of Navigation and Steamboat Inspection. Following the loss of the *Morro Castle* due to fire off Asbury Park, New Jersey, 1934, with 134 lives lost, the entire organization was set up under revised regulations. In 1935, the *Mohawk* collided off the New Jersey coast killing 45 persons because of misunderstanding between the terms "port and starboard helm," and "right and left rudder." A merchant marine technical staff for approving basic safety characteristics of plans and specifications for passenger vessels was created in 1936, and at the same time the name of the Bureau was changed to Bureau of Marine Inspection and Navigation—commonly referred to as the BMIN. In the same year, the inspection laws were amended to include the inspection of motor propelled vessels as well as all inflammable or combustible cargo tank vessels and tank barges, no matter how propelled. In 1936, the U.S. Congress ratified the 1929 international convention. But, by this time, there was a feeling that another convention should be held. Before this could be done, the sombre aspect of World War II appeared.

NOW UNDER COAST GUARD

The marine inspection functions of the BMIN were transferred to the Coast Guard by Executive Order No. 9083, dated February, 28, 1942, as a wartime measure. In 1946 the President, pursuant to the authority vested in him by the Second War Powers Act, submitted Reorganization Plan No. 3 which became effective on July 16, 1946. This plan transferred permanently all func-

tions previously mentioned in Section 101 to the Commandant, U.S. Coast Guard. Other functions of the BMIN, such as admeasurement, documentation, conveyances, and entry and clearance of vessels, were transferred to the Bureau of Customs. At the same time, Plan No. 3 abolished the Bureau of Marine Inspection and Navigation.

Owing to the greatly reduced American maritime operations subsequent to the termination of World War II hostilities, the permanent transfer of marine inspection to the Coast Guard coincided with a noticeable reduction in number of marine casualties. For the year ending June 30, 1946 (fiscal 1946), there were 5,000 vessel casualties as compared with 2,600 casualties for fiscal year 1947. These were non-war casualties to passenger vessels, freighters, tankers, ferries, towing vessels, fishing, and miscellaneous craft. About one-fourth of the casualties of each year occurred to uninspected vessels, such as fishing vessels and smaller type miscellaneous craft. The major causes of all casualties were groundings and foundering, collisions with other vessels, collisions with objects other than vessels, and heavy weather and material damage. The total property damage for such casualties was \$75,000,000 in 1946 and \$60,000,000 in 1947.

The number of lives lost in marine accidents increased from 155 in 1946 to 195 in 1947, even though there were fewer vessels in operation. The reason for this was due to the relative seriousness of some casualties. The Texas City disaster in April, 1947, involved three merchant vessels and forty-four mariners, while more than 500 non-mariners were also killed. For approximately the same number of vessels involved in fires and explosions, the property damage in 1947 amounted to 17 million dollars as compared to 5 million dollars in fiscal 1946.

In the first half of fiscal 1948, as a result of such disasters as the *Markay* tanker explosion at Los Angeles, the excursion steamer *Island Queen* explosion at Pittsburgh, and other major and minor marine mishaps, there have been (estimated) close to seventy-five lives lost and \$30,000,000 worth of damage to property.

The above incidents and figures illustrate the fact that, with marine inspection, the

Coast Guard has a *preventive* job to do. Instead of patrolling or standing-by on an "always ready" basis for mishaps to take place and then giving assistance or performing rescue, the Coast Guard must now apply itself to preventing those mishaps *before* they occur.

By no means should attention to search and rescue ever be completely relaxed. It is preferable that proportionate attention be given to prevention *and* rescue as it will make for an organization with both functional and popular balance. No organization would want to devote all of its procedures to the detection and prevention of fire, and then not know how to fight that fire when it could no longer be prevented. The Coast Guard can point with pride to the results of its rescues and assistances. It can do this principally because there is little difficulty in recording such deeds of valor. But, it will not be able to point with similar pride to the prevention of accidents as its record will be one of intangible results. Unfortunately, there is no way of statisticizing the number of mishaps that were "prevented."

In proper recognition of marine inspection functions, the Coast Guard has established an Office of Merchant Marine Safety as though to counterbalance the prewar Office of (search and rescue) Operations. All functions of marine inspection are performed within the Office of Merchant Marine Safety. This Office has cognizance over and coordinates the policies and activities of three principal divisions; namely, the Merchant Vessel Personnel Division, the Merchant Marine Technical Division, and the Merchant Vessel Inspection Division.

In addition to the Office of Merchant Marine Safety and its three divisions, a Merchant Marine Council has been established to consider and act upon proposed merchant marine safety regulations (including changes to existing regulations) and approval of merchant vessel equipment. The Council serves as a fact-finding body in an advisory capacity to the Commandant, conducts public hearings twice annually, and provides a forum where problems concerning the public and the industry can be considered. Eighty industry consultants are members of three panels to the Merchant Marine Council.

Inasmuch as the prevention of marine accidents is a *continuous* task, the Office of Merchant Marine Safety is obligated to the constant endeavor to instill safety mindedness in the mariner, operator, and traveler. It will do little good to raise materiel standards of safety without corresponding efforts to better personnel standards.

It has been estimated that more than sixty per cent of all marine accidents result from human rather than mechanical factors. One of the first steps, therefore, towards promoting safety at sea is the assurance of a competent, adequate, and disciplined merchant marine crew. While a poor ship can be operated safely with a good crew, the best ship can easily come to grief if manned by a poor crew. Discipline as a factor in merchant marine safety should not be undervalued.

All Federal functions, exclusive of training, leading to competent, adequate, and disciplined crews on merchant vessels are administered by the Merchant Vessel Personnel Division of the Coast Guard. This division maintains liaison with other government and maritime organizations (shipping management and labor unions) interested in the availability, competence, welfare, and conduct of merchant seamen. It develops and conducts examinations for licenses and certificates (in this connection there are 12,000 different problems and questions for officers' license examinations); it supervises the shipment and discharge of seamen in accordance with "Shipping Articles" (articles of agreement between master and seamen); and it develops and reviews procedures for investigating and taking disciplinary action against merchant mariners. The MVP Division maintains an extensive file of close to 200,000 licenses issued and over a million and a quarter jackets covering the details of service of seamen on merchant vessels.

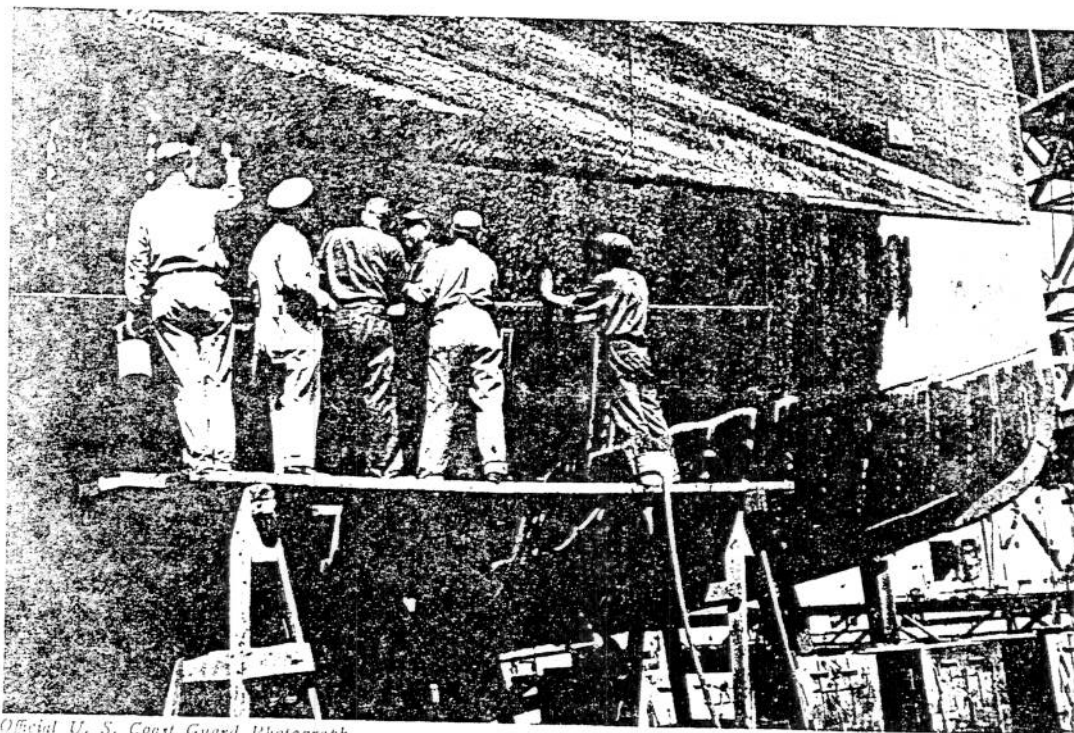
Investigating Units, under the cognizance of the MVP Division, carry out the procedures involving disciplinary action against merchant seamen. These Units operate in U. S. ports (in certain foreign ports Merchant Marine Details operate under State Department Consulate Generals) following a marine casualty or other irregularity leading to charges of incompetence, misconduct, negligence, unskillfulness, or will-

ful violation of law by licensed or certificated members of the merchant marine. The method of an Investigating Unit is one of investigation and trial of the person or persons charged. Each individual subject to trial is accorded the customary rights of civil law in the presence of a hearing examiner. Reasonable proof of a serious charge can lead to suspension or revocation of a license or certificate, thus, in effect, precluding employment on U.S. merchant vessels.

Inasmuch as a Coast Guard license or certificate is a prerequisite to employment on American merchant vessels, the purpose of Investigating Units is to administer discipline associated with safety at sea. This does not include matters which are properly contractual between mariner and vessel operator, nor matters of a criminal nature. Such matters are handled by other appropriate agencies of the Federal Government, and the Coast Guard endeavors to work in cooperation with them.

Until recently, disciplinary hearings have been conducted by Coast Guard examiners. But due to the Administrative Procedure Act effective June 11, 1947, no persons other than examiners appointed by the Civil Service Commission are permitted to preside at such hearings. As a result, since Civil Service Examiners have not been appointed, nor funds allotted, hearing procedures have been at a standstill. Until such time as this condition can be remedied or the Coast Guard (because of its unique status in the Federal administration) can be exempted from this particular requirement of the Act, disciplinary measures are necessarily confined to investigations and charges. These measures are ineffective and can ultimately lead to incompetent and unsafe merchant crews.

In addition to a competent merchant crew of adequate numbers, a vessel must also be fit in design, structure, condition, and equipment, if it is to withstand the perils of the sea and be of commercial value. Indeed the



Official U. S. Coast Guard Photograph

A SHIP'S BOTTOM GETS A CAREFUL INSPECTION

Coast Guard inspectors drilling and gauging plates and marking defective rivets on a ship's bottom in drydock.

underlying principle of merchant ship construction is one of providing a maximum of safety consistent with practicability. However, that which is practicable for a new vessel is not necessarily practicable for an old vessel. It is more economical to "build-in" safety features at the start, than to "tack-on" after a structure is complete. Within these limits fall the standards of technical and structural matters under the supervision of the Merchant Marine Technical Division.

More specifically, the Merchant Marine Technical Division provides advisory service with respect to improving materiel standards; it reviews vessel plans and specifications; it conducts and reviews stability tests, primarily on passenger vessels; it receives reports of load line (*i.e.*, freeboard) inspections; it analyzes, tests, and approves certain equipment used on board merchant vessels; it initiates specifications for factory and mill inspections of lifesaving equipment and boiler plating; it initiates welding specifications for new construction, repairs, alterations, and conversions; and it participates in cooperative studies of structural failures of vessels. When plans of passenger vessels of 100 gross tons and over are reviewed, particular attention is paid to material used, construction and location of bulkheads, propelling machinery and auxiliaries, electrical apparatus and emergency sources of power, fire and bilge-pumping arrangements, watertight door mechanisms, steam and pressure piping, fire-proofing and fire-retardant materials, fire detection and extinction, loud speakers and alarm bells, and sanitation.

The MMT Division maintains an active approval list of 1,400 items of equipment. The list includes such items as: lifeboats, winches, davits, life-preservers, line-throwing guns, safety valves, secondary water-level indicators, portable fire extinguishers, gas masks and breathing apparatus, flame arresters, boilers, feedwater regulators, etc. This and certain other equipment having a bearing on the safety of life at sea is required by law to be approved for use on board merchant vessels.

Even though a vessel is properly constructed, equipped and manned, the activities of preventive safety are still not complete. There must be some system to "follow through." There must be an in-service drill

and inspection to maintain the vessel and its personnel in a desired condition of readiness. The functions pertaining to such drills and inspections are performed by the Merchant Vessel Inspection Division.

In general terms, the Merchant Vessel Inspection Division administers the program for assuring compliance with operational and inspectional requirements through forty-six field Marine Inspection Offices. In addition to the various shipboard inspections and emergency drills, there are shipyard, factory, and mill inspections. For example, all iron or steel plates or other material used in the construction of boilers or unfired pressure vessels are mill tested for tensile strength, homogeneity, toughness, and ability to withstand repeated heating and cooling. If in accordance with approved specifications, the plate is stamped by a marine inspector and may then be used on inspected vessels. Various navigation (pilot rules), motorboat registration, and hazardous cargo (*e.g.*, ammonium nitrate fertilizer) regulations come within the jurisdiction of the MVI Division. Marine casualty investigating boards, traveling inspectors (who board merchant vessels to conduct drills and reinspections at sea), and fire-fighting experiments (such as the *Phobos* cotton-burning experiment in San Francisco) also come within the realm of vessel inspection functions, as do inquiries, complaints, appeals, and waivers of the inspectional standards, interpretations, and decisions.

Because of the exceptionally broad scope of the activities of the MVI Division, its functions are frequently misconstrued as the marine inspection functions of the Coast Guard. This is due to the vast operational nature of vessel inspection as contrasted to the advisory nature of the activities of the personnel and technical divisions. But as previously indicated, the MVI division is one of three divisions which perform functions of marine inspection.

In addition to the organizational activities for assuring compliance with preventive safety standards, the practical application of marine inspection also includes a library of texts, booklets, and pamphlets. The regulatory progress of the modern marine age has been, and is being, recorded in an increas-

ingly complex system of laws, regulations, instructions, and forms. No one could pursue the described functions without encountering a multiplicity of inspectional publications. Exclusive of abundant instructional, informational, and reference material, there are at least 12 official Coast Guard publications pertaining to regulations for merchant marine inspection. These publications, totaling over 10,000 regulations, are based on some 350 "Laws Governing Marine Inspection." No one person could ever be expected to possess more than a superficial knowledge of all the regulatory and interpretive material available on the subject of marine inspection.

In order to record properly the activities of marine inspection, a virtual "catalog of forms" is necessary. It is almost unbelievable that there are some 300 paper forms in use by Headquarters and marine inspection field units of the Coast Guard. These forms vary in type and size from the single memorandum slip to the quadruple multi-colored 14" X 28" tabloid Shipping Articles. The value of these forms is best high-lighted by the Certificate of Inspection. This Certificate serves notice to all concerned that the vessel on which it is posted is manned, equipped, and constructed for a safe voyage by sea over the route specified. Certification to this effect is made by a local Officer-in-Charge, Marine Inspection, and is supported by such particulars as: official number of vessel, name of owner and master, complement of officers and crew, authorized number of passengers,

ground tackle, life-boats, life preservers, fire extinguishers, length of fire hose, diameter of boiler drums and thickness of plates, minimum efficiency of weakest longitudinal drum section, maximum steam pressure allowed, condition of tail shaft, and other relevant matters.

For the past three years, an average of approximately 8,500 marine craft have received Certificates of Inspection during each year. Once a vessel receives a Certificate of Inspection, she becomes a legally safe ship for a period of one year. At the expiration of that period she must again submit to applicable procedures of merchant marine inspection.

In administering the functions of marine inspection, it is the Coast Guard's aim to improve standards for minimizing marine accidents and irregularities and, at the same time, to effectuate a reasonable balance between humanitarian and practical factors. In time of peace, the problem is one of balancing preventive safety with the factors of shipping management economy. In time of war, the fulcrum is shifted to balance marine safety with the factors of military necessity. At either time, the Coast Guard serves as a vital link between the merchant marine and the interests of the nation. As the nation becomes more and more dependent upon a merchant marine for its national welfare and survival, merchant marine inspection will play a correspondingly significant role in the future of the Coast Guard.



THE UNEXPECTED SUBMARINES

Contributed by GILBERT STUART

In 1863 Congress authorized, among a great many other warships, the construction of twenty small monitors. These little ships were practically small scale copies of the first Monitor. They had a turret with a single eleven-inch smooth-bore gun, and armor eight inches thick, with an extra armored ring around the base of the turret. The displacement was supposed to be 614 tons, the draft four feet.

There was a real need for such craft in the war then raging, and they were rushed to completion. The work on them was possibly rushed too fast, for somebody blundered badly; the first of the little monitors slide from the ways *right to the bottom of the river*, for she was not bouyant enough to float the weight of her armor and gun.

The *Casco* and one or two others were made available for river service by removing their turrets and letting their single gun rest, unprotected, on top of the raftlike hulls. Needless to say, such makeshift improvements did not render them popular with their officers or crews, and no tears were shed when the wretched little craft were sent to the scrap pile a few years later.

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to and printed in, the PROCEEDINGS.)