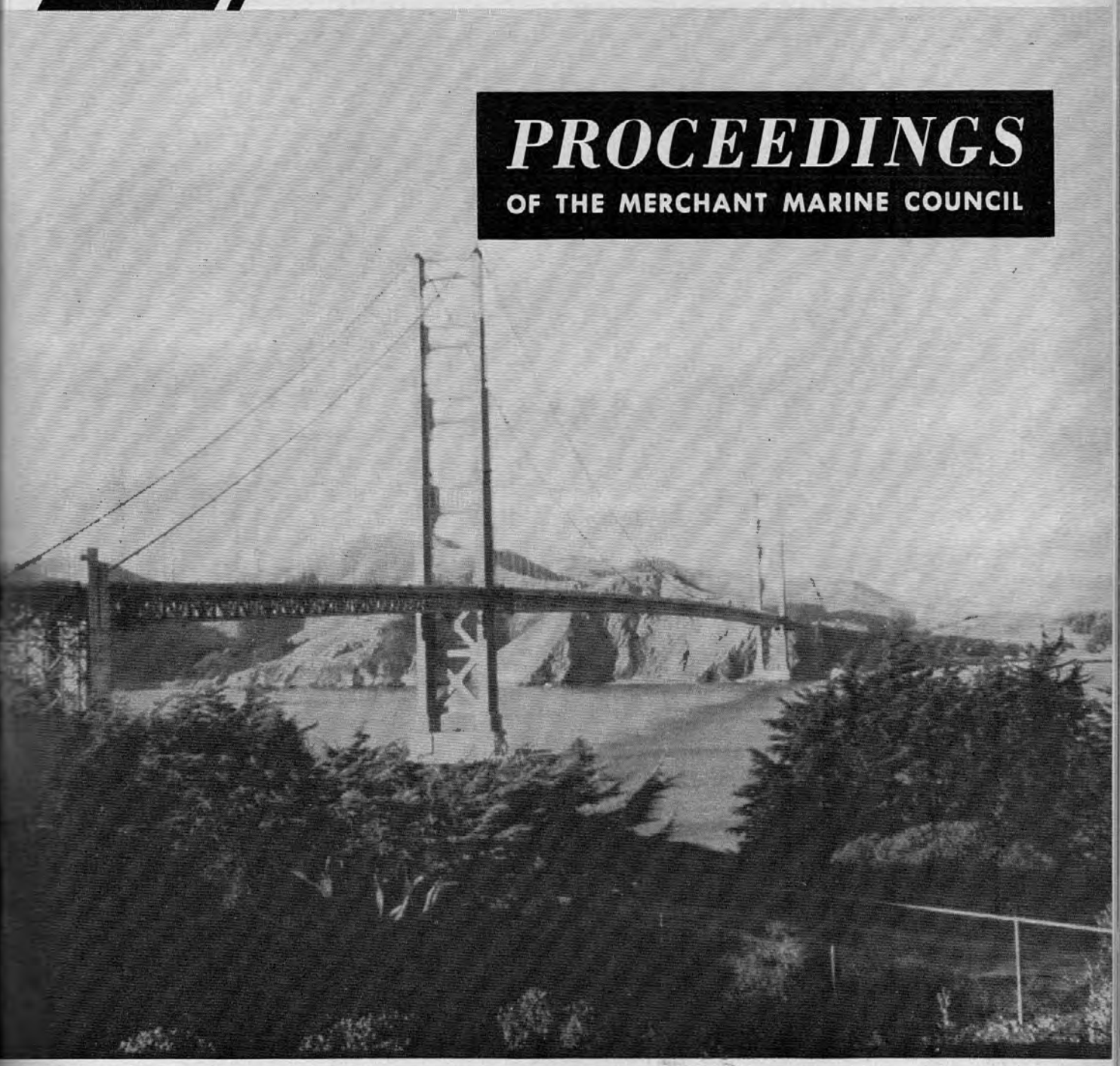
COAST GUARD



PROCEEDINGS

OF THE MERCHANT MARINE COUNCIL

Vol. 25, No. 9 CG–129 September 1968

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THIS COPY FOR NOT LESS THAN 20 READERS—PLEASE PASS IT ALONG

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COVERS

FRONT COVER: The Golden Gate Bridge. Spanning one of the world's busiest navigation routes, this highway suspension bridge provides a horizontal clearance of 4,028′ and a high water vertical clearance of 232′.

BACK COVER: AMVER, the Coast Guard's computerized system used to aid search and rescue efforts, is briefly outlined. Further information is available from Commander, Eastern Area, U.S. Coast Guard, Governors Island, N.Y. 10004. In the Pacific region, contact Commander, Western Area, U.S. Coast Guard, U.S. Appraisers Bldg., 630 Sansome St., San Francisco, Calif. 94126.

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PROCEEDINGS

OF THE

MERCHANT MARINE COUNCIL

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BRIDGES OVER navigable waters must be constructed with the needs of navigation in mind. In this case, a vertical lift railroad bridge over the Illinois River, the raised lift span provides for overhead clearance.

BRIDGES

Alfred T. Meschter

Assistant Bridge Administrator, Bridge Branch

Aids to Navigation Division, U.S. Coast Guard Headquarters

London Bridge is falling down!

WELL, not quite. But it is now being dismantled and prepared for shipment to the United States for erection over the Colorado River at Lake Havasu City, Arizona. It will be added to the ever-growing list of bridges built in the United States each year. While this famous structure will be used primarily as a tourist attraction in its new location, its journey serves to illustrate that even an historic landmark must make way for a newer and larger bridge necessary to meet modern day transportation needs in London.

Today the tremendous demand for new highway construction in the United States requires, as an integral part of such construction, the building of bridges across valleys, rivers, canals, other highways, and railroads. This modern day boom in highway construction far exceeds the railroad construction boom during the last century.

Because of the vast networks of railroads that were being built throughout the country in the latter 1800's, the established navigation system on the great network of natural

SLOW PASSAGE and caution are necessary here. The opening provided by the double-leaf bascule bridge is narrow, and a railroad swing bridge is close at hand.

waterways and canals was in peril. Without adequate protection of law, this vital navigation system could have been destroyed by the unregulated construction of low-level railroad bridges built with little or no regard to the long recognized, but unstated, public right of navigation on the waters of the United States. Congressional action was required.

On September 19, 1890, legislation, amended in 1892, was enacted which prohibited the erection of obstructions to navigation. It also prohibited the erection of bridges over navigable waters under state legislation without the approval of the plans by the Secretary of the Army. The intention of Congress under this Act was to take exclusive charge of such matters for the United States.

The 1890 Act was superseded by the River and Harbor Act of March 3, 1899. The intent of Congress was affirmatively restated. The Bridge Act of March 23, 1906, further amplified the position of the Federal Government. It prescribed in more detail the procedures to be followed after Congress granted authority for the construction of a particular bridge across state waters, as well as other navigable waters of the United States.

The necessity for protecting the navigable waters recognized in 1890 was expanded further on August 18, 1894, when Congress enacted legislation which provided for regulation of drawbridges by the Secretary of the Army. All persons owning, operating, and tending drawbridges were required to open the draws for the passage of vessels and not unreasonably delay their passage. This act was later amended in 1902 to add a minor provision for enforcement of the regulations.

It was not until 1946 that Congress, overwhelmed by the necessity to individually authorize bridges over navigable waters, passed the General Bridge Act. The general consent of Congress was granted for the construction, maintenance, and operation of bridges and approaches, excepting international bridges, over the navigable waters of the United States. The existing requirement for approval of the plans and location of these bridges by the Secretary of the Army and Chief of Engineers remained unchanged. However, the Secretary of the Army and Chief of Engineers were further empowered to impose specific conditions relating to the maintenance and operation of the structure deemed necessary in the interest of public navigation. These added powers were formerly exercised by Congress in authorizing individual bridges.

A bridge across a navigable stream is an obstruction to navigation tolerated only because of necessity and the convenience of commerce on land. The right of navigation is paramount. The Act of March 23, 1906, expressly provided that no bridge erected or maintained over navigable waters should at any time unreasonably obstruct the free navigation of the waterway. The Secretary of the Army was made responsible for assuring that navigation through and under all bridges was reasonably free, easy, and unobstructed. Alteration or removal of an unreasonably obstructive bridge, when required, was to be at the expense of the person owning the bridge.

This burden of expense on an owner who was required to alter an obstructive railroad bridge resulted in passage of the Truman-Hobbs Act of June 21, 1940, providing Federal funds for such alterations. This act was subsequently amended on July 16, 1952, to extend similar relief to publicly owned highway bridges. The expense of alteration of such bridges in excess of the used life value was authorized to be borne by the Federal Government.

The bridges expected to be altered under the Truman-Hobbs Act within the next 5 years are estimated to require an expenditure of Federal funds

of more than $56,000,000. The number of obstructive bridge cases requiring Federal expenditures is expected to grow as it has in the past. Each year bigger barges are built and more barges compose the tow units to meet the ever-increasing transportation demands of our growing economy. These larger vessels require greater bridge clearances.

Since passage of the Truman-Hobbs Act, 20 bridges have been altered at a cost of $64 million. The Federal Government's share of this cost was more than $42 million. The total benefits to the waterway user and the economy of the area served were substantially greater than the costs involved. No bridge is altered unless the benefits to navigation are reasonably expected to be greater than the cost of the alteration to the Government.

The Department of Transportation Act approved on October 15, 1966, declared as its purpose the assurance of a coordinated, effective administration of the transportation programs of the Federal Government. In consonance with this stated purpose those functions of the Secretary of the Army and Chief of Engineers relating to bridges over navigable waters were transferred to the new Secretary of Transportation. These functions are essentially the approval of the plans and location of bridges over navigable waters with navigational aspects in mind, the regulation of drawbridge operation, and the alteration of bridges found to be obstructive. The Secretary of Transportation delegated these responsibilities to the Commandant, U.S. Coast Guard on April 1, 1967.

The first task of the Coast Guard was the development of the personnel structure required under Coast Guard organization. An extensive review of the 39 Corps of Engineers Districts was undertaken to determine the workload and personnel input of the Corps and facilities employed.

A total of 43 civilian positions and one military billet were established and distributed among nine Coast Guard Districts and Headquarters according to workload and manpower requirements. No positions were established in the Eleventh, Fourteenth, and Seventeenth Coast Guard Districts because of the very limited bridge activity within those areas. It was expected that the Chief, Aids to Navigation Branch in these districts would be able to perform these duties without additional personnel. However, Headquarters assistance would be provided as well as assistance from adjacent Districts staffed with bridge personnel, if required.

At Coast Guard Headquarters, the Chief, Aids to Navigation Division was assigned the responsibility of program manager. The Chief, Civil Engineering Division was assigned the responsibility of providing engineering support for the alteration of obstructive bridges, and otherwise as required.

The Bridge Branch, under the program manager, was established to administer the provisions of law and prepare appropriate recommendations to the Commandant for the approval of plans and location of bridges. The Obstructive Bridge Branch within the Civil Engineering Division was established to provide the required engineering support to the Bridge Branch.

While the Commandant became responsible for these bridge functions on April 1, 1967, it was necessary to provide for continuity of service to the public during the transfer of records and development of the necessary personnel structure and facilities within the Coast Guard. The Chief of Engineers agreed to continue to perform these functions on a reimbursable basis for and under the direction of the Commandant until June 30, 1968. This procedure allowed time for the procurement of personnel who would be performing these duties in Coast Guard Headquarters and Dis-

A THROUGH truss railroad bridge spanning the Mississippi at St. Louis. Vertical clearance is 44' at high water.

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trict offices. At the end of December, 1967, this preparatory phase was well advanced, and assumption of the bridge functions from the Corps of Engineers began. On April 1, 1968, the transfer of the files, records, and workload of the Corps of Engineers' Districts was nearly complete, and the final assumption occured as scheduled on June 30, 1968.

In preparation for the final assumption of all the assigned bridge functions before June 30, 1968, two bridge function conferences were held for Coast Guard personnel. The first conference was held in San Francisco, April 18, for the Coast Guard District personnel on the West Coast. The second conference was held in Washington, D.C., May 2, for the personnel of the other Coast Guard Districts. These conferences effected completion of planning and resolved the remaining problems, ensuring an orderly transfer on schedule.

While certain functions pertaining to the navigational aspects of bridges were new missions, the function pertaining to lights and signals on these bridges was already under jurisdiction of the Coast Guard. These existing functions under the Aids to Navigation Division were assigned by the program manager to the Bridge Branch to provide for administration of all bridge functions as a single program.

London Bridge, when erected on the Colorado River, will be a unique structure, but so are all bridges, as each one is custom designed and constructed. Accordingly, each application requires individual detailed study. During the first year of activity under the Coast Guard between April 1, 1967, and April 1, 1968, a total of 186 permits were issued by the Commandant. These permits were predominantly for fixed highway bridges. However, the list included highway drawbridges in addition to railroad bridges and industrial structures.

Growth of navigation on the inland waterways over the past two decades generated by the industrial development of the areas they serve has been phenomenal. This growth is illustrated by the increase of cargo tonnage on the upper Mississippi River from less than 4 million short tons in 1940 to nearly 42 million short tons in 1965.

This growth on the upper Mississippi River is not peculiar to that waterway alone. It is indicative of the growth of all the inland navigation systems. Such growth also illustrates the problems confronting the Coast Guard in carrying out the responsibilities it is now charged with in this new mission to balance the paramount right of navigation with the needs of land transportation in the face of nearly overwhelming growth of both modes of transportation.

WITH A VERTICAL clearance of 48', this cantilever-truss highway bridge over the Illinois River allows for free flow of both river and highway traffic.

OXYGEN—FRIEND OR FOE?

Joseph A. ASHLEY,

Bureau of Labor Standards

Hazards of Too Much and Too Little Oxygen in Shipyard Work

OXYGEN is one element vital to all plants and animals. It is also one of the most important materials used in industry today. Workers in many industries and trades must know how to use pure oxygen properly. They must also be aware of situations that may cause a dangerous deficiency of this life-giving gas in the places where they work.

The atmosphere contains about 20 percent oxygen by volume. Concentrations as low as 15 percent have been found safe for humans to breathe, if no toxic materials are present. However, below this level it becomes increasingly hazardous for respiration—especially since there may be no warning of impending collapse.

If the oxygen level in air is much higher than normal, there is an increased fire hazard because of the greater intensity with which most flammables will burn. Some materials that are nonflammable in normal air will burn easily in an oxygen-enriched atmosphere.

A deficiency of oxygen in the air in enclosed spaces may be caused by certain chemical reactions which consume oxygen. In ships, the most commonly affected spaces include sealed tanks and compartments, closed holds and pipe tunnels, and voids and cofferdams. The oxygen-consuming processes include rusting of metal, fermentation of fruits and vegetables, and drying of paint.

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Good safety practice requires that the atmosphere in enclosed spaces be properly tested to determine if there is enough oxygen present to sustain life. Men may enter the compartment only after the atmosphere is proved safe.

Oxygen deficiency does have a few practical uses. One of the most important is in extinguishing fires. Like man, fire requires oxygen. The basic operating principle of some fire extinguishing agents, such as carbon dioxide and foam, is the exclusion or dilution of air. When the fuel is shielded from the air, or when the oxygen level drops below about 12–14 percent (for petroleum products), the fire will die out.

Commercial oxygen may be purchased either as a gas in cylinders under 2,000 p.s.i. pressure, or in liquid form, at atmospheric pressure and a temperature of −297° F.

Oxygen cylinders (and other gas cylinders under high pressure) present two major hazards. First, the cylinder may be damaged by rough handling, and burst catastrophically—for all practical purposes, it explodes. The effects will be similar. Second, valves may be damaged through such abuse as failure to cap them when not in use, or when being moved. If the valve jams open, or is broken off, the gas cylinder becomes a rocketlike missile unless very firmly clamped down. A full cylinder can fly several hundred feet through the air, and with sufficient force to smash through brick walls.

An oxygen cylinder can also present serious problems during a fire. These cylinders are equipped with plugs which are supposed to melt out if the cylinder is engulfed in a fire. This will prevent the cylinder from exploding as the heat raises the temperature and pressure of the gas. Of course, the oxygen is then released and will intensify the fire.

To eliminate these potential hazards, and to achieve economies in operations, most of the large U.S. shipyards have converted to bulk piped oxygen systems. The oxygen is

stored in liquid form under low pressure, and vaporized and released as needed through reduction valves to the distribution system.

Oxygen is produced for industrial purposes by liquefying and distilling air. The oxygen is drawn off as a liquid, since it has a higher boiling point than most of the other gases in air. The liquid oxygen is transported to the storage site in tank trucks and pumped into insulated low-pressure tanks.

While bulk oxygen liquid eliminates certain hazards associated with the use of cylinders, it does introduce some other problems. The liquid oxygen, at —297° F, can freeze tissue almost instantly. If a man should be drenched by a large splash or spill, he would almost certainly be killed.

The quantities of oxygen usually involved also present a serious fire hazard. The transfer operation, from truck to tank, has been the source of at least one major accident. In one shipyard, a 2,000-gallon tank truck was being off-loaded when a fire occurred. Oxygen, which was necessarily bled off in the transfer operation, contacted flammables in the area which were ignited by an unknown source. The resulting series of explosions was followed by a raging fire which was eventually brought under control before any lives were lost. The company sustained property damage losses close to $1 million. The material loss was great, but the potential loss in human life could have amounted to much more; only good fortune prevented such a tragedy. Despite similar occurrences, the trend is toward bulk storage, since bulk storage on the user's premises is more economical. The risks can be controlled by observing suitable safety procedures.

Incidents of this type suggest the need for a national safety standard on the handling and storage of liquid oxygen. In drafting such a standard the following points should necessarily be covered:

- Physical isolation of the storage tanks.
- Special materials for the tanks, as well as for the valves and piping connections.
- Proper grounding of tanks and their pumping systems to reduce the chance of a buildup of static electricity.
- Safety procedures for transferring the liquid oxygen from the truck or barge to the storage tank.

So far, only the problems associated with the storage of oxygen have been considered. Hazards connected with its use in various shipyard operations should also be looked into. Although a percentage of on-the-job accidents—those taking place at the point of operation—can be traced to defective equipment, frayed hoses, defective torches or connections, most are generally attributable to human error or intentional misuse. While cases of multiple injuries are on record, mostly the user himself is the sole victim. Accident studies indicate either an ignorance of the properties of oxygen on the part of the user or a disregard of known hazards. This misuse of oxygen by the operator appears to follow an erroneous assumption by the employee that oxygen is somehow "like air" and can be used for the purposes for which air is often used, such as cooling the person or his surroundings, cleaning off dust or debris from the work, or for freshening stale air in work spaces. Although oxygen is as effective as air in these uses, it presents a hazard that air does not.

The principal advantage of pure oxygen is its acceleration and intensification of combustion. Because of this property, the penalties for misuse are intensified. In an oxygen-enriched atmosphere, a cigarette bursts into flame, and clothing, which might only smolder if ignited in a normal atmosphere, burns intensely and is much more difficult to extinguish. The injury to the victim is always more severe.

Investigations by the Bureau of Labor Standards' field staff under authority of the Longshoremen's and Harbor Workers' Compensation Act reveal the following unsafe practices and conditions which have contributed to accidents:

1. Use of oxygen under pressure to blow slag or other debris away from the work area or from the cut.
2. Use of oxygen to "sweeten" the stale air in a space.
3. Use of oxygen to cool the body. (On hot, humid days, it quickly lowers the temperature in a compartment and makes the work area more comfortable.)
4. Use of leaky hoses and equipment which allows oxygen to accumulate in the space.
5. Removal of the gas-consuming equipment from the hose, leaving the open-ended hose in the space.
6. Failing to shut off the valve on the manifold, or the master valves at the header, when the torch is left inside the compartment for an extended period of time.
7. Temporarily securing the flow of oxygen through a faulty torch or through an open-ended hose, by crimping and tieing off hose ends. (When preparing to change welding, brazing or cutting torches on the ends of hoses, operators sometimes crimp the hose temporarily instead of shutting off the valves at the manifold.)
8. Mistakenly connecting a hose to an oxygen supply instead of to an air supply system.

In each of the accidents investigated, one or more of the foregoing unsafe conditions or acts were involved.

For example: In a Southern shipyard, five workmen in a forepeak tank of a vessel undergoing repairs were burned to death when a hose was mistakenly attached to an oxygen header instead of to an air header.

In the East, an accident due to oxygen enrichment of a space claimed the lives of two men and badly burned

two others standing nearby. Although in this case the source of ignition was undetermined, it was established that excess oxygen in the compartment contributed to this accident.

In another Southern yard, a man who had intentionally used oxygen to "cool himself off" was fatally burned when his clothing was ignited accidentally.

Another Eastern yard was the scene of a fatality when a foreman deliberately attempted to ventilate a tank with his oxygen hose before entering.

Reviewing the cases, it appears that the misuse of oxygen outweighs actual operating defects in the tools and hose as a causative factor. This misuse of oxygen can be traced to either a lack of specific knowledge of the consequences of ignition of an oxygen-enriched atmosphere, or from a feeling on the part of the workman that "it can't happen to me." In the last 3½ years, 10 men have burned to death from this cause, and as many men, escaping death, have been painfully and seriously injured. In addition, several deaths have resulted when men entered compartments with oxygen-deficient atmospheres. The total number of near-misses is not known, but it is probably a good multiple of what is known.

The answer to this problem is thorough dissemination of the facts—how drastically the presence of excess oxygen increases the fire hazard—and conversely how rapidly a flame (and life) is choked off when the oxygen content in air is reduced much below its normal content. This teaching should involve actual controlled demonstrations of oxygen-aided combustion, and of the extinguishment of a flame in oxygen-deficient air. Workmen must be thoroughly convinced that the rules applicable to the safe use of this gas, and the rules on the testing of atmospheres in closed spaces, must be strictly observed at all times.

The "Competent Person Training Course," given by the staff of the Bureau of Labor Standards' office throughout the country, has concentrated on this vital problem. In conjunction with the classroom lectures, demonstrations are given to present practical visual evidence of the effects of enriched and deficient atmospheres.

TRAINING FILM AVAILABLE

A training film has been produced by the Maritime Safety Division of the Bureau entitled, "Shipyard Fire and Explosion Hazards." This film forcibly drives home several important points on the handling of oxygen and the dangers of misusing it. In addition to visual aids, various departmental publications describe the problem and set forth safeguards. These training aids and publications are available to interested groups on application to the local Bureau of Labor Standards office. The educational approach is buttressed by the day-to-day field visits of the Maritime Safety Officers. These contacts are face-to-face ones, made in the course of safety meetings and during on-the-job shipboard exchanges with representatives of both management and labor.

The importance of the message of oxygen—its use and misuse—demands that it be told to the people most affected by it, the workmen exposed to the hazards. The constant flow of personnel in and out of the industry requires that the story be told again and again. ⚓

—Reprinted from Safety Standards.

UNLEASHED GANGPLANKS

Recently a super tanker docked at Perth Amboy. She discharged cargo and rose in the water until the deck was about 20 feet above the wharf. At this time a shore gang was loading stores. A longshoreman came down the gangplank and was about three steps from the bottom of the gangplank when the gangplank skidded off the ship and fell. The man was thrown against a stanchion and onto the wharf. Fortunately, he was not seriously hurt.

In 1962 at the same dock, a gangplank slipped off a super-tanker. An ordinary seaman rode it down, a distance of some 10 feet. He couldn't stand up after landing, but X-rays showed no broken bones, and the man was soon back on the job.

In 1964 a vessel was at the dock at Anchorage, Alaska. When the ship came in, she was level with the wharf and the ship's gangplank was put out. Some 8 hours later the tide had gone out and the ship was 15 to 20 feet below the dock. A wiper was taking on water. He went onto the wharf, shut off the hydrant and started down the gangplank. It rolled inboard and fell to the deck with the man. He was banged up but able to continue on the job.

In November 1963 a pilot was coming aboard a vessel from the dock at Baltimore. The vessel was light. Just as he was about to step on the ship's deck, the gangplank rolled out and dropped him into the water. His elbow was chipped.

All four of these accidents were inexcusable and are a direct reflection on the mate or mates on deck. In the first case there is some suggestion that the longshoremen moved the gangplank and left the lashings off. This does not relieve the mate on watch of his responsibility to see that the gangway is properly secured and adjusted so that it will always be a safe means of access to the ship. ⚓

From a Tanker Company

U.S. MERCHANT MARINER'S INFORMATION SYSTEM

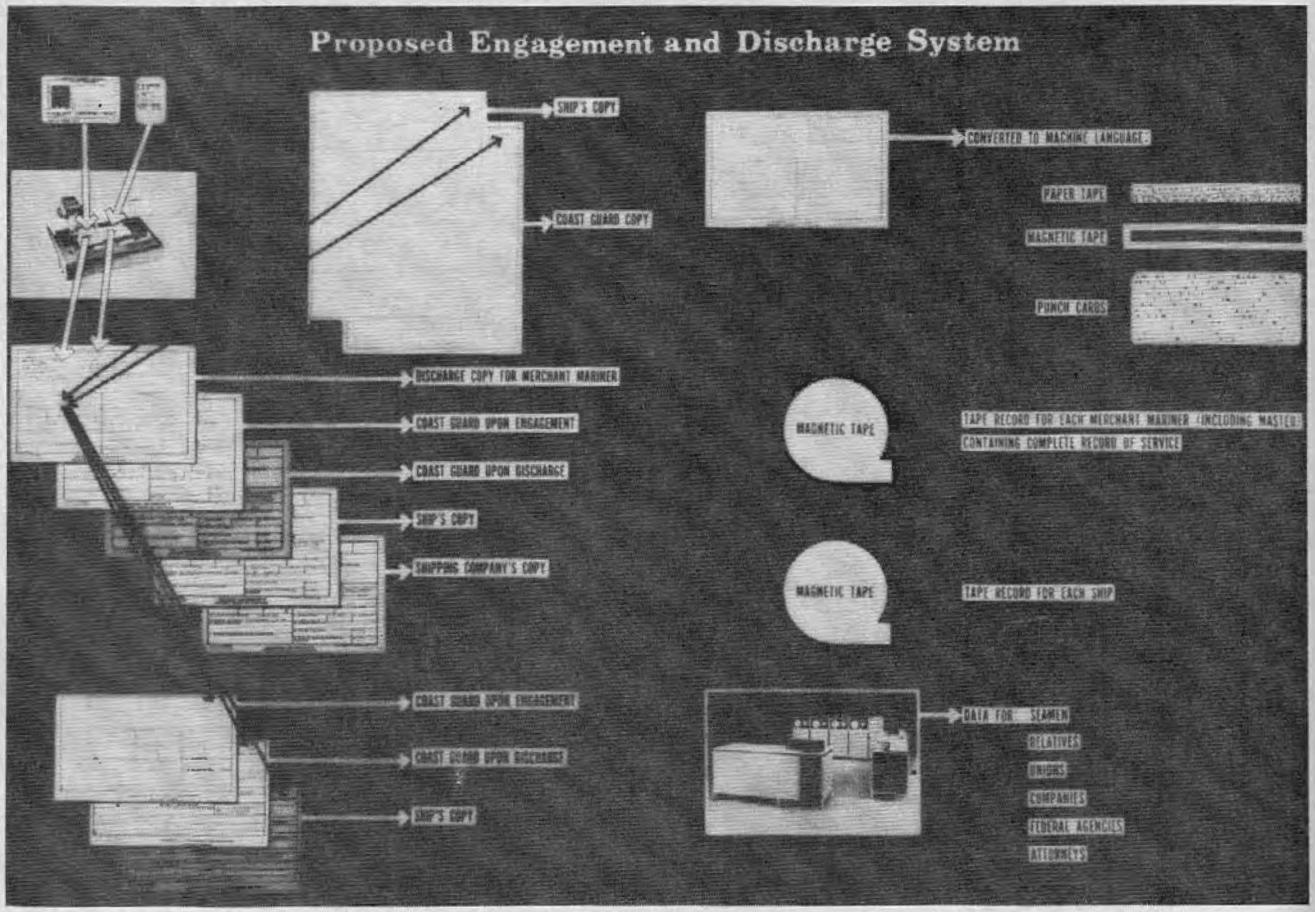


Figure 1.

THE MODERN COMPUTER would be used in conjunction with the familiar Merchant Mariner's Document (MMD) in a new system being developed by the U.S. Coast Guard to streamline methods of hiring and releasing merchant seamen.

Pending legislative proposals (H.R. 18547 and S. 3759) would authorize the Coast Guard to implement a system that would considerably simplify the paperwork procedures necessary in signing-on and signing-off U.S. merchant seamen. As a part of the system, the Coast Guard would computerize the service records it is required to maintain on merchant mariners.

The proposed information system is being developed by a Coast Guard study team with technical assistance from the Department of Transportation's Office of Facilitation. Labor and management have been consulted at each stage of the project. The simplified paperwork procedures, as presently developed, incorporate suggestions derived from these consultations.

Generally, the system would work as follows: Embossed laminated iden-

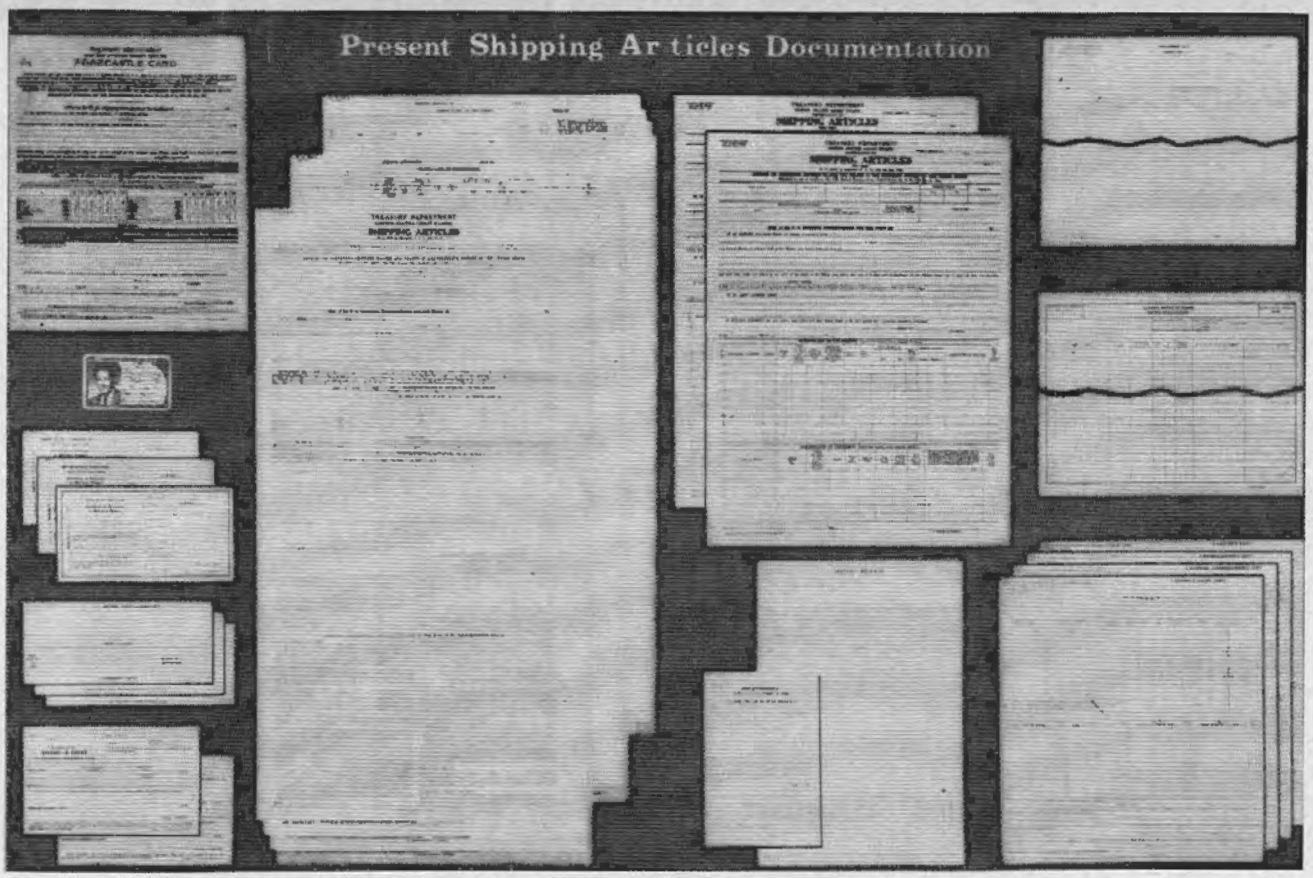


Figure 2.

tification cards would be used to transfer mariner and vessel identification data onto a standardized, individual employment record. (*See Figure 1.*) Then the employment record would be transferred to the Coast Guard data processing center. The information on the employment record would be converted to computer language and stored for automatic retrieval. Authorized users would then be able to obtain data on merchant mariners or vessels.

The proposed Merchant Mariner Information System would utilize several documents containing data elements developed jointly by labor, management, and Government. The following forms have been developed:

U.S. Merchant Mariner's Document, an embossed identification card carrying a seaman's photo, name, citizenship, birth date, social security number, "Z" number, indication of qualifications, and other necessary data.

Vessel Data Card, also an embossed identification card and containing only the most essential items, such as name, number, date and port of registry of a vessel, names of the operator and owner, and other necessary data.

Forecastle Card, which would carry the voyage description and terms of agreement between the master and seaman.

Employment Agreement, the individual contractual agreement between the seaman and the master in conjunction with the Forecastle Card.

Employment Record, a reporting form for Great Lakes and coastwise mariners and others not requiring a contractual agreement by law. This would replace form 735T, the presently used personnel reporting form.

These forms are the backbone of the proposed paperwork system, which has been sufficiently developed that it is ready for testing. Plans have been made to test the system at four different ports: New York, New Orleans, San Francisco, and Cleveland. The diverse locations were chosen to assure adequate coverage under different types of ship operations and voyage employment situations. The new system will be tested parallel with the present sign-on/sign-off process to avoid disruption until it can be fully smoothed out and ready for implementation.

The Merchant Mariner's Information System would provide a number

of benefits to all parties involved in the merchant marine industry. The most apparent advantages would be a reduction of paperwork and time spent in the sign-on/sign-off process. Vessel operators, maritime unions, and the Federal Government would be able to simplify record-keeping procedures by using the briefer forms.

The reduction in time spent in the sign-on/sign-off process would be particularly significant to large crews on passenger vessels and to those seamen who sail on vessels that spend little time in port due to quick turnarounds. The seaman would also find his service record maintained by the Coast Guard to be more accurate and complete, and he would be able to obtain it much faster and at less cost. (The cost is now $5.50 for the first page and $2.50 for successive pages, with records averaging one to three pages.)

Issuing, upgrading, or replacing Merchant Mariner's Documents would be accomplished in a single visit to an Officer in Charge of Marine Inspection (OCMI). Photographs costing less than the presently required commercial photos would be taken by the OCMI and the card would be prepared in a single transaction. Though the information contained on the MMD would be essentially the same as it is now, the mariner's social security number would become the key to identifying his records.

More economical, accurate, and timely manpower and vessel data would be available to all maritime interests. Pension and welfare funds could have access to employment information on their members, as a supplement to their files. Vessel operators could benefit from statistical analysis, obtaining factual knowledge that could be helpful in competing for a share of the transportation market. Manpower statistics could be used in labor and management planning to determine projected training needs for skills in short supply. Federal agencies, such as the Maritime Administration, would be able to obtain maritime statistics with greater facility.

Enabling legislation, which is needed to pave the way for implementation of the system, would replace several laws enacted between 1872 and 1940. The existing statutes have been the major barrier to previous efforts to improve the sign-on/sign-off system. These laws gave rise to the existing system, a process often requiring hours to complete. Lengthy forms must be filled out by hand, causing lost time and ever-mounting paperwork.

The proposed system, with its uncluttered documents, contrasts markedly with the present one. One of the forms used in the present system is the Shipping Articles, a 12-part document 14 inches wide and 28 inches long. (*See Figure 2.*) The Shipping Articles spell out the contract between a ship's master and its crew.

They state in detail the minimum daily rations to which each seaman is entitled—for example, three fourths of an ounce of "coffee (green berry)" every day; half a pint of molasses on Sundays, Tuesdays and Thursdays; a pound of salt pork on Mondays, Wednesdays and Fridays; half a pint of vinegar on Tuesdays and Saturdays. The Articles also specify that crewmembers can bring "no dangerous weapons or grog" aboard ship and that they must be given a "daily issue of lime and lemon juice and sugar, or other antiscorbutics."

By contrast, the proposed Forecastle Card states the agreement concisely on a single page without enumerating unneeded details.

The legislation required for implementation of the Merchant Mariner's Information System would preserve the protective features of existing laws. Its purpose is to establish a paperwork system that is not bound by time-consuming procedures and outdated requirements. In future months the system will be refined to this end, while action is pending on the necessary legislation. ⚓

WALKIE-TALKIES CREATE TROUBLE

A number of unusual accidents have been caused by the increased use of walkie-talkies aboard vessels, of which the following is an example:

The Master of a docking ship ordered the chief mate "to let go the port anchor," and his command was carried out. However, the chief mate of another ship steaming a half-mile away unfortunately believed that the order came from his own Captain and let go his ship's anchor as well, thus causing a catastrophe.

On investigation, it was revealed that the walkie-talkie sets on both ships were on the same radio frequency.

There have been other similar accidents when using this equipment for communications, but the foregoing well illustrates the dangers.

To overcome mistakes and confusion, a command should always be preceded by the name of the person to whom it is directed, i.e., "Chief Mate Granowitz, let go the port anchor."

Courtesy Marine Transport Lines, Inc. Safety Letter

DECK

Q. Why does a deeply loaded vessel frequently steer badly?

A. Because of the wake current. Owing to the vessel's fineness forward there is no wake when going astern and, for this reason, some ships' waterplane sections are frequently even finer aft than they are forward. In heavily laden and beamy vessels this wake current, when going ahead, causes an inert body of water under the stern to press around the rudder and interfere with its natural action.

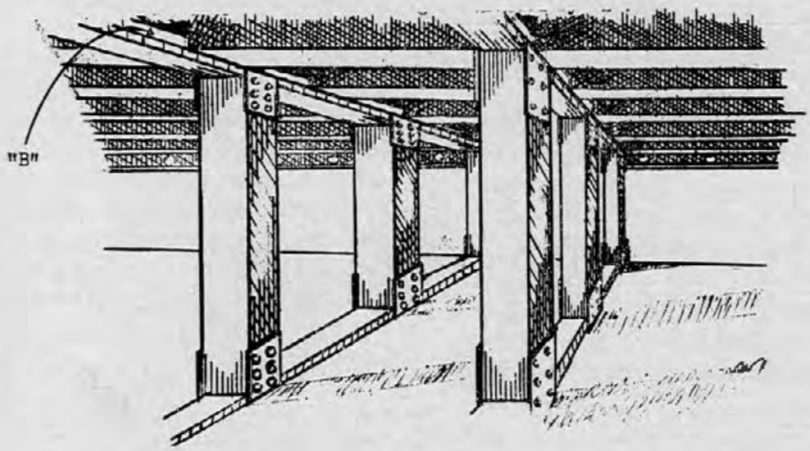
Q. What person does the law require to be in charge of a lifeboat on an ocean steamer and with what particular duty is he charged?

A. A licensed deck officer or a certificated lifeboatman shall be placed in charge of each boat by the master and a second-in-command shall also be nominated by the master. The person in charge shall have a list of its crew and shall see that the men placed under his orders are acquainted with their several duties.

A man capable of working the motor shall be assigned to each motorboat by the master.

A man capable of working the wireless and searchlight installations shall be assigned to boats carrying this equipment by the master.

SHORING



Q. a. When is shoring, as illustrated, used in the 'tween deck of a vessel?

b. What is the purpose of the carlings indicated by "B"?

A. a. Shoring such as that sketched is used when heavy concentrated weights which exceed the permissible load per square foot are carried on deck.

b. The carlings are to prevent the deck beams tripping under the load.

ENGINE

Q. Explain the procedure to be followed under the marine inspection regulations when having a pressure part of the boiler permanently repaired by welding.

A. Prior to any work being done the proposed repair shall be approved by the Officer in Charge, Marine Inspection. An approved welder qualified in accordance with Coast Guard regulations shall perform the welding. The weldment shall be preheated, stress relieved, and radiographed in accordance with Coast Guard regulations. Upon completion the boiler shall be hydrostatically tested by a marine inspector, U.S.C.G.

Q. 1. Which portable extinguisher would you use for an oil fire:

(a) Soda acid
(b) CO_2
(c) Dry chemical
(d) (b) or (c) above
(e) (a), (b), or (c) above

A. (d) (b) or (c) above

Q. Which of the following indicates the main difference between a relay and a contactor?

(a) Contactors control current, relays control voltage
(b) Relays control current, contactors control voltage
(c) A contactor is series connected, a relay is parallel connected
(d) A relay is series connected, a contactor is parallel connected
(e) Contactors can handle heavier load currents than relays

A. (e) Contactors can handle heavier load currents than relays

AMENDMENTS TO REGULATIONS

Title 46 Change

SUBCHAPTER A—PROCEDURES APPLICABLE TO THE PUBLIC

SUBCHAPTER E—LOAD LINES

LOAD LINES FOR VESSELS ENGAGED IN DOMESTIC OR FOREIGN VOYAGES BY SEA

1. The International Convention on Load Lines, 1966, has been ratified by the required number of signatory countries and will become effective on July 21, 1968. Copies of this new Convention may be obtained from the Government Printing Office, Washington, D.C. 20402, by requesting for "Load Lines: Convention with Regulations—1966"; for $1.25 per copy (It is also identified as "Treaties and other International Acts Series 6331"). This Convention will replace the 1930 International Load Line Convention. Under Article 16(4) of the 1966 Convention, U.S.-flag vessels holding 1930 International Load Line Certificates issued on or before July 20, 1968, will have until July 21, 1970, to apply for and be issued 1966 International Load Line Certificates. On and after July 21, 1970, the United States normally will not accept International Load Line Certificates issued under the 1930 International Load Line Convention. Under Article 4(4) of the International Convention on Load Lines, 1966, existing ships having load lines may not be required to increase their freeboard. However, such ships which do not comply with the requirements of the 1966 Convention will be issued 1966 Convention certificates with appropriate notations.

2. The rules and regulations in this document contain the applicable requirements governing the assignment of load line marks, the certifications of load line marks placed on ships, and editorial corrections and changes to various rules and regulations to reflect the necessary changes in requirements and administration because the International Convention on Load Lines, 1966, supersedes the 1930 International Load Line Convention, on July 21, 1968. The rules and regulations in this document shall be effective on and after July 21, 1968; however, at the option of the owner and to permit for an orderly transition to the new requirements, the owner may request and be issued Coastwise Load Line Certificates as set forth in 46 CFR Part 42 prior to July 21, 1968, if the assigning authority finds the ship in compliance with the revised requirements.

3. The major changes in the load line requirements as set forth in this document from those previously published in 46 CFR Parts 43 to 46, inclusive, may be described as follows:

a. Effective July 21, 1968, no load line certificates will be issued which are based on the forms published in 46 CFR Part 43, but will be of the style and format as shown in 46 CFR Subpart 42.50 in this document.

Courtesy G. Seal

b. Under the new requirements all vessels engaged in foreign and coastwise voyages will be designated as a Type "A" or a Type "B" ship, and no separate category provided for "tankers," which will be considered normally as a Type "A" ship.

c. Existing vessels will not be automatically eligible for a decrease in freeboard. It will be necessary to show compliance with new requirements applicable to such vessels. For example, a Type "B" ship must have hatch covers meeting the new strength requirements. If the vessel has portable wood or steel plate hatch covers instead of pontoon covers or watertight gasketed hatch covers in an exposed freeboard deck or in the forward quarter-length of an exposed superstructure deck, the penalty applied removes the decrease in freeboard so that the vessel's freeboard will not be changed.

d. The chief differences in the revised load line regulations from those previously in effect are:

(1) Minimum requirements for minimum bow height or prescribed forecastle.

(2) Increased recognition given to subdivision for cargo ships, the modification of the sheer correction, and the elimination of the camber correction, the flush deck penalty, and certain penalties for Winter North Atlantic Service.

(3) Cargo ship subdivision is different from passenger ship subdivision because no margin line concept is required. Instead, the flooding limits are maximum angle of heel, "angle of down-flooding" and/or loss of stability. This is a new concept and the details have been worked out in

conjunction with the American Bureau of Shipping.

(4) The basic freeboard tables have been decreased. The 1966 tanker table is represented by the Type A freeboard table. The 1966 steamer table is represented by the Type B curve. Any Type B ship that can show either one compartment or two compartment subdivision will be able to use additionally decreased freeboard.

e. For passenger ships no change was made for calculating subdivision, which is in accordance with the Passenger Vessel Regulations (46 CFR Parts 70 to 80, inclusive; Subchapter H). The margin line and flooding limits, etc., are applied the same as before.

4. In accordance with the notice of proposed rule making published in the FEDERAL REGISTER of February 29, 1968 (33 F.R. 3564–3570), and the Merchant Marine Council Public Hearing Agenda dated March 25, 1968 (CG–249), the Merchant Marine Council held a public hearing on March 25, 1968, for the purpose of receiving comments, views, and data. The proposals considered were identified as Items PH 1–68 to PH 8–68, inclusive. Item PH 1–68 contained proposals regarding "Load Lines" (CG–249, pages 1 to 120, inclusive). These proposals, as revised, are adopted and set forth in this document.

5. Interested persons have been afforded an opportunity to participate in the consideration of these proposals and certain changes were made in the proposals as a result thereof. With respect to the load lines for vessels engaged in international or coastwise voyages (Item PH 1–68), the text of 46 CFR Part 42 was revised to reflect views and comments set forth in 45 written comments and two oral comments received at the public hearing. These changes may be described briefly as follows:

(a) Rearrangement of requirements to parallel those in the International Convention on Load Lines, 1966.

(b) Rearrangement of the "administration" provisions in the proposals designated 46 CFR Subpart 42.01 along the lines used in other Coast Guard regulations and redesignating such practices, procedures, rules, and regulations as 46 CFR Subpart 42.01, authority and purpose; Subpart 42.03, application; Subpart 42.05, definition of terms used in this subchapter; Subpart 42.07, control, enforcement, and rights of appeal; Subpart 42.09, load line assignments and surveys—general requirements; and Subpart 42.11, applications for load line assignments and certificates.

(c) Many comments questioned the applicability of the revised load line regulations, especially those established under the International Convention on Load Lines, 1966, to a specific type of vessel; namely, oceanographic research vessels. The revised regulations designated §§ 42.03–1 to 42.03–15, inclusive, describe in greater detail the application of load line requirements by types of vessels and types of voyages in which vessels may be engaged. Attention is invited to the 1930 Convention which applied only to "merchant vessels" of 150 gross tons or over engaged on international voyages. The 1966 Convention applies to all new vessels of 79 feet or longer in length and to all existing vessels of 150 gross tons or over, which engage in foreign voyages or international voyages by sea (other than solely on Great Lakes voyages) and fly the flag of a country adhering to the Convention, except (i) ships of war; (ii) fishing vessels; (iii) pleasure craft (yachts) not used or engaged in trade or commerce; (iv) new vessels of less than 79 feet in length, and (v) existing vessels of less than 150 gross tons. The 1966 Convention applies to both registered vessels and unregistered vessels of a contracting Government and therefore includes U.S.-flag vessels numbered by a State under the Federal Boating Act of 1958, public vessels, etc., which do not come within one of the above listed exceptions. Those comments requesting that oceanographic research vessels engaged on international voyages be exempted from compliance with the 1966 Convention are rejected since the United States cannot unilaterally exempt such vessels from requirements other than as described in the Convention.

(d) The new regulations in 46 CFR Part 42 are primarily intended for vessels on international voyages and have their origin in the International Convention on Load Lines, 1966. Under the authority in section 2 of the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88a), these regulations have been made applicable to domestic voyages by sea (coastwise, intercoastal, and special service voyages) by U.S.-flag merchant vessels of 150 gross tons or over, as applicable, to take advantage of reduced freeboards related to improvements in ship design and construction.

(e) The model forms of load line certificates in 46 CFR Subpart 42.50 were edited. The instructions to the assigning authority set forth in the forms were designated as sections, except where the instructions assist the surveyor in completing the form satisfactorily. The model International Load Line Certificates are set forth in a separate § 42.50–5. The model load line certificate for foreign-flag vessels of countries not adhering to the 1966 Convention is in § 42.50–10. The model coastwise load line certificates for U.S.-flag vessels are in § 42.50–15.

(f) Editorial changes are made to the current load line requirements in 46 CFR Part 43 to remove conflicts and duplication of revised requirements now in 46 CFR Part 42. Effective July 21, 1968, no new load line certificates following the model forms in 46 CFR Part 43 shall be issued.

(g) Editorial changes are made to

INTERNATIONAL CONVENTION ON LOAD LINES, 1966

On July 21, 1968, the "International Convention on Load Lines, 1966," entered into force for the following countries:

Denmark (acceptance)
France (acceptance)
India (acceptance)
Israel (acceptance)
Italy (acceptance)
Liberia (acceptance)
Malagasy Republic (acceptance)
Maldive Islands (accession)
Mauritania (accession)
Morocco (accession)
Netherlands (acceptance)
Surinam and Netherlands Antilles
Norway (acceptance)
Panama (signature)
Peru (acceptance)
Somalia (accession)
South Africa (acceptance)
Sweden (accession)
Switzerland (acceptance)
Trinidad and Tobago (acceptance)
Tunisia (acceptance)
Union of Soviet Socialist Republics (signature)
United Kingdom (acceptance)
United States of America (acceptance)

The Secretary-General of the Inter-Governmental Maritime Consultative Organization announced on May 30, 1968 (LL/Circ.22), that Japan on May 15, 1968 deposited an Instrument of Acceptance, which will take effect on August 15, 1968. Also, that Finland had deposited an Instrument of Accession on May 15, 1968, which will take effect on August 15, 1968, and that the Democratic Republic of the Congo had deposited an Instrument of Accession on May 20, 1968, which will take effect on August 20, 1968.

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the load line requirements in 46 CFR Parts 44 to 46, inclusive, to bring these regulations up to date, correct cross references, and delete obsolete requirements.

(h) Editorial changes are made to 46 CFR 2.85–1 in Subchapter A (Procedures Applicable to the Public) to bring it up to date and reflect the change in application of requirements implementing the International Convention on Load Lines, 1966.

6. In the administration of the International Convention on Load Lines, 1966, and as stated in Article 16(4) thereof, the 1930 International Load Line Convention certificate requirements will be superseded by the 1966 Convention on July 21, 1968, insofar as the United States of America is concerned. On and after July 21, 1968, the United States will not issue International Load Line Certificates under the provisions of the 1930 Convention. On and after July 21, 1970, the United States normally will not accept International Load Line Certificates under the provisions of the 1930 Convention other than as may be permitted for certain foreign vessels in the administration of Articles 16 and 28 of the 1966 Convention.

7. As provided in Article 24(1) of the International Convention on Load Lines, 1966, the other treaties and agreements with the Government of Canada regarding load lines and marine inspection matters shall continue to have full and complete effect.

8. The actions and recommendations of the Merchant Marine Council with respect to comments and views received and changes in the proposals in Item PH 1–68 (CG–249, pages 1 to 120, inclusive), are hereby adopted.

9. By virtue of the authority vested in me as Commandant, U.S. Coast Guard, by section 632 of Title 14, United States Code, and 49 CFR 1.4 (a)(2) to promulgate regulations in accordance with the laws cited with the regulations below, the following regulations and amendments in this document are prescribed and shall be effective on and after July 21, 1968: *Provided*, That the regulations in this document with respect to coastwise load line requirements, other than the zones and seasonal areas in 46 CFR 42.30–1 to 42.30–35, inclusive, may be complied with during the interim period prior to the effective date specified in lieu of existing requirements.

The complete text of these changes has been published in the Federal Register of July 12, 1968, Part II.

These regulations may be obtained from the local marine inspection office or by writing Commandant (CAS–2) U.S. Coast Guard, Washington, D.C. 20591.

CIRCULARS
NVIC 4–68

REFERENCES

(a) 46 CFR, Subchapter H, Rules and Regulations for Passenger Vessels.

(b) 46 CFR, Subchapter I, Rules and Regulations for Cargo and Miscellaneous Vessels.

(c) 46 CFR, Subchapter D, Rules and Regulations for Tank Vessels.

This circular establishes guidelines indicating what types of protective clothing are intended for inclusion in fireman's outfits required on merchant vessels.

Amendments to Regulations 63 and 65 of the International Convention for the Safety of Life at Sea, 1960 were adopted in 1966 by the Intergovernmental Maritime Consultative Organization General Assembly to require that the fireman's outfits on passenger, cargo, and tank ships include protective clothing, rigid protective helmets, and electrically nonconductive boots and gloves in addition to the items previously required. These and several other amendments are being circulated to the signatory Governments for adoption. These amendments have not come into force internationally; however, adoption by the appropriate number of countries is expected. A Resolution was adopted at the 1966 Assembly recommending that all Governments put these measures into effect without awaiting their entry into force. Public Law 89–777 requires this equipment to be carried on passenger ships. Reference (a) was amended on 20 December 1967 to include these items. Subsequently, an additional Convention amendment has been proposed by IMCO which

would require two fireman's outfits for each cargo and tank vessel. This proposal will be considered at the next regular IMCO Assembly. Favorable action is expected. Amendment of references (b) and (c) to incorporate both of these changes will be necessary.

Specific approval requirements are not made for these additional items since it is believed desirable to accept such equipment of a type commonly used on vessels and by shoreside firemen which is readily available from safety equipment suppliers. Several types of each of the items are commonly available and are suitable for the intended purpose. This approach has been satisfactory for fire axes. Items of the following types are considered acceptable:

i. Protective clothing of water resistant material covering the body and extending to the neck, wrists and ankles. This could be a regular fireman's raincoat and pants (turnout clothes) or a ¾ length seaman's foul weather jacket with pants of a tight woven material.

Note: Asbestos suits are not required nor recommended. Such equipment can only be used properly by highly trained professional firefighting teams. Experience indicates that the untrained wearer will advance too closely upon a fire and be subjected to possible scalding by a misdirected hose stream.

ii. Calf length electrically nonconductive boots commonly on board or of a type used by the fire service.

iii Any electrically nonconductive gloves providing wrist protection.

iv. Electrically nonconductive protective helmets of the "hard hat" type commonly found on board or the fireman's helmet.

Effective date—24 June 1968.

Copies of this circular may be obtained at the local marine inspection office or by writing Commandant (CAS–2), U.S. Coast Guard, Washington, D.C. 20591.

NVIC 5–68

This circular publishes additional information regarding the design and installation of fixed firefighting equipment aboard merchant vessels. In particular, acceptable means of providing ready availability of firefighting water aboard passenger ships are discussed.

Effective date—8 July 1968.

Copies of this circular with enclosure (1) may be obtained at the local marine inspection office or by writing Commandant (CAS–2), U.S. Coast Guard, Washington, D.C. 20591.

ACCEPTABLE HYDRAULIC COMPONENTS

Nonductile hydraulic components which have passed high impact shock tests, unless otherwise noted, the material is cast iron.

Manufacturer	Valve type	Identity	Maximum allowable pressure (p.s.i.)
Abex Corporation Denison Division 3315 West 12th St. P. O. Box 7353 Houston, Texas 77008	Directional control.	Series D2D04.	3, 500
Vickers, Inc. Waterburg Plant P. O. Box 302 Troy, Michigan 48084	Directional control.	Series CM–11.	1, 200

STORES AND SUPPLIES

Articles of ships' stores and supplies certificated from July 1 to July 31, 1968, 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

Malter International Corp., Post Office Box 6099, New Orleans, La. 70114: Certificate No. 816, dated July 8, 1968, XL 98; Certificate No. 817, dated July 8, 1968, XL 99; Certificate No. 819, dated July 17, 1968, ELECTRO-DRY.

CRC Chemicals, Division C. J. Webb Ind., Dresher, Pa. 19025: Certificate No. 818, dated July 12, 1968, CRC SOFT MARINE SEAL.

Humble Oil & Refining Co., Houston, Tex. 77001: Certificate No. 820, dated July 22, 1968, COREXIT 7657; Certificate No. 821, dated July 22, 1968, BREAXIT 7941.

Murray Chemical Co., Inc., Pier 46–A, The Embarcadero, San Francisco, Calif. 94107: Certificate No. 822, dated July 22, 1968, MURCO 849.

AFFIDAVITS

The following affidavit was accepted during the period from June 15, 1968, to July 15, 1968:

Texas Valve Specialty, Inc., 201 Hilbig Rd., Conroe, Tex. 77301.

FUSIBLE PLUG

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 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 May 15, 1968, to June 15, 1968, is as follows:

Lunkenheimer Corp., Cincinnati, Ohio 45214, HEAT NOS. 745, 746, 747, & 748.

MERCHANT MARINE SAFETY PUBLICATIONS

The following publications of marine safety rules and regulations may be obtained from the nearest marine inspection office of the U.S. Coast Guard. Because changes to the rules and regulations are made from time to time, these publications, between revisions, must be kept current by the individual consulting the latest applicable Federal Register. (Official changes to all Federal rules and regulations are published in the Federal Register, printed daily except Sunday, Monday, and days following holidays.) The date of each Coast Guard publication in the table below is indicated in parentheses following its title. The dates of the Federal Registers affecting each publication are noted after the date of each edition.

The Federal Register may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Subscription rate is $1.50 per month or $15 per year, payable in advance. Individual copies may be purchased so long as they are available. The charge for individual copies of the Federal Register varies in proportion to the size of the issue but will be 15 cents unless otherwise noted in the table of changes below. Regulations for Dangerous Cargoes, 46 CFR 146 and 147 (Subchapter N), dated January 1, 1968 and Supplement dated July 1, 1968, are now available from the Superintendent of Documents, price: basic book $2.50, Supplement: 20 cents.

CG No.	TITLE OF PUBLICATION
101	Specimen Examination for Merchant Marine Deck Officers (7–1–63).
108	Rules and Regulations for Military Explosives and Hazardous Munitions (8–1–62).
115	Marine Engineering Regulations and Material Specifications (3–1–66). F.R. 12–6–66, 12–20–67, 6–1–68.
123	Rules and Regulations for Tank Vessels (5–2–66). F.R. 12–6–66, 12–9–67, 12–27–67, 1–26–68, 1–27–68, 2–10–68, 4–12–68, 6–1–68.
129	Proceedings of the Merchant Marine Council (Monthly).
169	Rules of the Road—International—Inland (9–1–65). F.R. 12–8–65, 12–22–65, 2–5–66, 3–15–66, 7–30–66, 8–2–66, 9–7–66, 10–22–66, 12–23–67, 6–4–68.
172	Rules of the Road—Great Lakes (9–1–66).
174	A Manual for the Safe Handling of Inflammable and Combustible Liquids (3–2–64).
175	Manual for Lifeboatmen, Able Seamen, and Qualified Members of Engine Department (3–1–65).
176	Load Line Regulations (1–3–66). F.R. 12–6–66, 1–6–67, 9–27–67, 7–12–68.
182	Specimen Examinations for Merchant Marine Engineer Licenses (7–1–63).
184	Rules of the Road—Western Rivers (9–1–66). F.R. 9–7–66, 12–23–67.
190	Equipment Lists (8–1–66). F.R. 9–8–66, 11–18–66, 2–9–67, 6–6–67, 6–14–67, 6–30–67, 8–29–67, 10–7–67, 4–16–68, 4–17–68.
191	Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel (5–1–68).
200	Marine Investigation Regulations and Suspension and Revocation Proceedings (5–1–67), F.R. 3–30–68.
220	Specimen Examination Questions for Licenses as Master, Mate, and Pilot of Central Western Rivers Vessels (4–1–57).
227	Laws Governing Marine Inspection (3–1–65).
239	Security of Vessels and Waterfront Facilities (3–1–67). F.R. 3–29–67, 12–23–67.
249	Merchant Marine Council Public Hearing Agenda (Annually).
256	Rules and Regulations for Passenger Vessels (5–2–66). F.R. 12–6–66, 1–13–67, 4–25–67, 8–29–67, 12–20–67, 1–27–68, 4–12–68.
257	Rules and Regulations for Cargo and Miscellaneous Vessels (1–3–66). F.R. 4–16–66, 12–6–66, 1–13–67, 12–9–67, 1–26–68, 1–27–68, 2–10–68, 4–12–68, 6–1–68.
258	Rules and Regulations for Uninspected Vessels (3–1–67). F.R. 12–27–67, 1–27–68, 4–12–68.
259	Electrical Engineering Regulations (3–1–67). F.R. 12–20–67, 12–27–67, 1–27–68, 4–12–68.
266	Rules and Regulations for Bulk Grain Cargoes (5–1–68).
268	Rules and Regulations for Manning of Vessels (5–1–67). F.R. 4–12–68.
270	Rules and Regulations for Marine Engineering Installations Contracted for Prior to July 1, 1935 (11–19–52). F.R. 12–5–53, 12–28–55, 6–20–59, 3–17–60, 9–8–65.
293	Miscellaneous Electrical Equipment List (4–1–66).
320	Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf (10–1–59). F.R. 10–25–60, 11–3–61, 12–28–61, 4–10–62, 10–13–62, 8–31–62, 4–24–63, 10–27–64, 7–29–65, 8–9–66.
323	Rules and Regulations for Small Passenger Vessels (Under 100 Gross Tons) (1–3–66). F.R. 12–6–66, 1–13–67, 12–27–67, 1–27–68. 4–12–68.
329	Fire Fighting Manual for Tank Vessels (4–1–58).

CHANGES PUBLISHED DURING JULY 1968

The following has been modified by Federal Register:

CG–176 Federal Register July 12, 1968 Part II.

QUESTIONS AND ANSWERS ON SEARCH AND RESCUE OPERATIONS

Lt. Commander B. G. Burns, USCG

Q. What type of search patterns does the Coast Guard use?

A. The type of search pattern depends principally upnn the search area. For instance the track crawl or Route Search pattern is employed when a craft is missing and the intended route is the only search lead. This pattern consists of a rapid and reasonably thorough coverage of the missing craft's proposed route and adjacent areas.

Q. Suppose the liferafts and the boats have all been launched. You and several other men are still on board with nothing except your life preservers. The seas are rough and the boats and rafts are about ¼ mile away. A Coast Guard Cutter is on the scene and has begun to pick up your shipmates from the raft and boats. What should you do?

A. First, get the distress signals that are normally stowed in a locker on top of the bridge and signal the cutter to make certain they know you are aboard. When the cutter captain sees your signal, or spots you on board, the rescue procedure will start immediately. If the seas permit a small boat will be launched to remove you. A line may be shot to you and a raft sent over. This method was attempted by a cutter in 1964, but was unsuccessful because the men involved tried to stay on top of the raft cover instead of getting inside. As a result the raft capsized throwing them all into the water. Two men were recovered by rescue swimmers wearing wet suits and tethered to the cutter with a line. The other three men were lost. The remaining crewmembers were then removed by being hauled from the ship with a line. One of them drowned because he passed out before the cutter could pull him aboard.

Some valuable lessons were learned during the above casualty. The main one being that several men were lost primarily because of their own actions. You should try to remember the following points during rescue operations.

1. Always get inside a rubber raft as soon as possible. With the weight in the bottom it is much less likely to capsize.

2. When being rescued via a line in the water, unless you are alone, always have a shipmate with you so that you can assist each other in case you or he lose consciousness while in the water.

3. If at night have a watertight flashlight on hand to assist rescue ship in spotting you. It is almost impossible to spot a man in the water at night without a light.

Q. When should distress signals be used?

A. Visual signals are only effective if the rescue craft is in sight. Save them until you see or hear the craft in your vicinity.

Q. When should the lifeboat radio be used?

A. The silent periods on 500 kcs from 15 to 18 minutes past the hour and 45 to 48 minutes past the hour are the best times for sending distress signals. The lifeboat radiotelegraph equipment is simple and rugged. If the radio operator is not in the boat, you can rig and operate it. The antenna should be put up in accordance with the instructions. The radio, when operated on automatic, will send out distress signals in the 500 and 8364 kcs bands. The distress signal, 12 four-second dashes (with one second intervals) followed by three SOS groups is sent on 500 kcs and should work the auto-alarm of any ship in the vicinity not standing a radio watch. The radio enables rescue vessels to take radio bearings and home in on the signal.

Q. How does the SOLAS exposure cover assist in sightings?

A. If a lifeboat is fully loaded, the inside which is painted international orange will not be visible to searching aircraft. This could cause your boat to go undetected. Rigging the SOLAS exposure cover presents a good visual sighting aid to both air and surface vessels. Tests have proven that contrasting colors raise the probability of detection considerably.

Q. At what distance can aircraft radar detect a lifeboat?

A. There are too many variables to be taken into consideration to give a definite distance for detection. However, under ideal conditions a metal lifeboat could be detected at a considerable distance.

Q. Will a rubber raft present a radar target?

A. Yes, however, it will not give as effective an echo as a metal target. The rigging of any type metal (cans, etc.) on a pole or on top of the cover will help.

Q. How much do rough seas affect visual sighting?

A. Very much. The presence of whitecaps and foam streaks nn the water break the uniformity of the surface and greatly reduces lookout effectivness. As the whitecaps become more numerous, the probability of detecting a small object becomes less. With numerous whitecaps and foam in a heavy, breaking sea, even large objects are difficult to detect, and small objects are unlikely to be detected at all. Rough seas also adversely affect radar detection due to the large amount of sea return on the scope and the fact that small targets in the trough of a sea cannot be detected. ⚓

Automated **M**erchant **V**essel **R**eport

AMVER

AMVER is a computerized, world-wide, merchant vessel plotting program, designed to maintain and provide information on vessels for use in search and rescue operations.

....To participate in the AMVER program, a vessel need only to send its sail plan and periodic position reports. There is no enrollment required and no agreement to sign.

....AMVER will plot ships anywhere in the world as long as they are able to send their sail plans and position reports to the Center.

....Participation by a vessel is free of cost to both the vessel and its company.

....Surface Pictures are provided, free of charge, to any recognized search and rescue agency in the world for use in saving lives and property at sea.

....Vessels participating in the AMVER program are under no greater obligation to render aid in emergency situations than are non-participants.

....The system has received international endorsement from both the 1960 Safety of Life at Sea (SOLAS) Conference and the Inter-Governmental Maritime Consultative Organization (IMCO).

U.S. GOVERNMENT PRINTING OFFICE: 1968