PROCEEDINGS
OF THE MARINE SAFETY COUNCIL

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IN THIS ISSUE . . .

Tanker Safety Study . . .
International Ice Patrol 1973 . . .

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CONTENTS

COVERS

FRONT COVER: The ill-fated SS *V. A. Fogg* is pictured prior to her sinking in the Gulf of Mexico during tank cleaning operations. Such vessel losses led the American Petroleum Institute to study tanker safety. Portions of the interim report of the American Petroleum Institute Division of Transportation's Tanker Accident Study Committee are found on page 27 of this issue.

BACK COVER: This "dry dock" iceberg is one of the hundreds that plagued mariners in the heavily traveled North Atlantic shipping routes. For the story on the annual effort made by the International Ice Patrol riding herd on bergs like this, turn to page 34.

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PROCEEDINGS

OF THE

MARINE SAFETY COUNCIL

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Lieutenant (jg) A. W. Vander Meer, Jr., Editor

TANKER ACCIDENT PREVENTION REPORT

In December 1969, explosions occurred in the cargo tanks of three very large tankers under conditions which were remarkably similar. Among other factors in common, all vessels were washing center tanks. These incidents were of grave concern and set into motion worldwide investigative efforts concerning possible ignition sources and tank washing procedures. In the United States, the studies are being coordinated by the Tanker Accident Study Committee (TASC) which was formed under the auspices of the American Petroleum Institute (API) Division of Transportation. On November 30, 1971, TASC published an interim report of their study.

On or about February 1, 1972, the tonkship SS V. A. Fogg *was lost in the Gulf of Mexico with all hands. Although the Coast Guard Marine Board of Investigation has not completed its report, it has tentatively concluded that lowering of an ungrounded air operated sump pump through the electrically charged mist of a recently washed cargo tank is the most probable source of ignition of explosive vapors present.*

As a result of the above events, chapters IV, V, and VIII of the TASC report dated November 30, 1971, are reprinted below in order to make available to our readers the valuable information regarding tank cleaning procedures, atmosphere control, ignition sources and safety precautions contained in that report.

This same information was disseminated as inclosure (1) to U.S. Coast Guard Navigation and Vessel Inspection Circular No. 7–72. Copies of that circular may be obtained by writing U.S. Coast Guard (GCAS–2/81), 400 Seventh Street SW., Washington, D.C. 20590.

TANK WASHING PROCEDURES AND ATMOSPHERE CONTROL

Objective

The objective of participating companies and the API consultant in the continuing research program has been to establish whether those tank washing procedures which have been historically safe in any atmosphere are actually safe and to experiment in the development of atmosphere control techniques. The objective of part of the research work has been to determine the safety aspects of tank washing variables, such as the use of hot water, the use of chemicals, and the number of portable machines in operation at one time in a given tank. Suggestions concerning these variables were listed in the International Chamber of Shipping (ICS) First Interim Report, September 1970, and repeated in the ICS Second Interim Report dated July 1971.

Discussions

In the process of tank washing, there are four alternative conditions in respect to the atmosphere in the tank which can exist:

Uncontrolled atmosphere
Too lean atmosphere
Too rich atmosphere
Inert atmosphere

Uncontrolled Atmosphere

In the case of uncontrolled atmosphere, the tank can be either within the flammable range, above the Upper Flammable Limit (UFL) or below the Lower Flammable Limit (LFL) depending on the previous cargo and the circumstances of the discharge of cargo.

Vessels operating under this system must take extra precautions in eliminating ignition sources.

It is suggested that the following procedures be included when tank washing in an uncontrolled atmosphere:

a. After discharge of cargo and upon completion of ballasting, all tank openings not in use should be closed. When tank washing is commenced, only those tank openings being used should be opened. The purpose of the foregoing is to prevent undesirable air and hydrocarbon gas exchanges taking place. If ventilation is used, it should be the final step when tank washing by this method.

b. It is recommended that fixed, high volume tank washing machines not be used.

c. The number of portable machines used in any compartment at any one time should be limited to four of the normal lower capacity type or three of the higher capacity type. Generally, cargo tank with no swash bulkhead is considered a single compartment while one swash bulk-

head in a tank divides the space into two compartments and two swash bulkheads divide the space into three compartments.

d. The electrical continuity of all tank washing hose bonding cables must be checked for electrical conductivity on every occasion before use. As an extra precaution to insure electrical continuity, washing machines should be flushed through with clean sea water before being inserted into the tank.

e. Clean, ambient temperature sea water should be used with portable washing machines. Recirculated wash water should not be used. Chemical additives and heated wash water should not be used until the tanks have been thoroughly washed with clean, cold sea water and gas concentrations are checked to insure that the levels are kept below 40% LFL.

f. Tanks should be kept thoroughly drained during washing operations. Operations should be stopped to clear any unusual buildup of wash water. Determination of liquid level can be done by sight or by hearing.

g. Ungrounded objects, regardless of the type of material, should not be introduced into the tank at any time when a mist of water vapor cloud might exist, unless enclosed within a standpipe or sounding tube which is built into the ship. This restriction includes sounding rods, ullage tapes, ungrounded gas sampling hoses, and canvas chutes for portable blowers. After washing has stopped, the waiting time for the introduction of isolated objects is 5 hours with natural ventilation, and 1 hour with mechanical ventilation.

h. Care should be taken to insure that tank washing connections are not broken until after the washing machine and hose have been removed from the tank.

i. Each time a vessel leaves a shipyard where work has been done in cargo tanks, a thorough inspection should be made to locate and remove scrap metal.

In view of the current electrostatics investigations, it appears that these precautions might be overly conservative. However, the continued recommendation for the use of these precautions will stand until a sufficient body of data indicates that particular precautions are not required.

The research work of the participating companies is continuing and directionally indicates the following:

a. Increasing the number of portable machines used in washing from one to four does not significantly affect the equilibrium charge density.

b. Raising the temperature of clean sea water used in washing tanks from 90° F. to at least 150° F. does not significantly affect the charge density.

c. Chemicals affect the magnitude and polarity of the charge. With the chemical concentrations ordinarily used for washing, the charge density obtained is not greater than the maximum charge density without the chemicals. However, charging when washing with the chemicals does tend to be somewhat greater than the *average* charging obtained when washing with clean sea water.

d. Electrostatic hazards and the size of a tank, or compartment are still under study. Under actual, full-size washing conditions, uncontrollable factors, such as the condition of the tank and possible contamination of washwater, influence the charging phenomena so as to make the interpretation of the effect of any one variable questionable.

Too Lean Atmosphere

A too lean atmosphere is an atmosphere which is incapable of supporting combustion because the hydrocarbon content is below the LFL. Those washing tanks in a too lean atmosphere are deliberately reducing the hydrocarbon content below the LFL by several experimental methods or combination of methods (see Annex).

Experimental methods can be summarized as follows:

a. Removal of oil liquid residues and displacement of hydrocarbon vapors by ballasting.

b. Removal of oil liquid residues and displacement of hydrocarbon vapors by ventilation.

Both methods require ventilation during washing, and constant monitoring of gas concentrations.

Further tests are currently in progress to improve and evaluate these experimental procedures. The aim of the tests is improved procedures and equipment, such as skimming devices which can reduce the ballast handling involved in practicing the too lean atmosphere control by removal of oil liquid residues.

Any of the experimental methods outlined in the Annex may be used to remove oil liquid residues from a tank to be cleaned and will assist in obtaining and maintaining a too lean atmosphere during washing.

Too Rich Atmosphere

A too rich atmosphere is one which is incapable of supporting combustion because the hydrocarbon vapor content makes the atmosphere above the UFL. The too rich atmosphere can occur occasionally as a natural phenomenon after discharge of cargo depending upon Reid Vapor Pressure (RVP), temperature, and the circumstances of the discharge of the cargo. Test data indicates that the too rich atmosphere cannot be relied upon to occur naturally on a regular basis. Constant monitoring of gas concentration should be employed.

Limited test work is being carried out in obtaining a too rich atmosphere by the spraying of crude oil during the latter part of the discharge operation. The spraying of crude oil to enrich the hydrocarbon content of the atmosphere is conceivably a valid procedure based on limited data indicating a very low level of electrostatic charging caused by the spraying of crude oil. Sufficient experimental data are not available at this time to formulate conclusions as to its practical feasibility.

Inert Atmosphere

An inert atmosphere is defined as one in which the oxygen content has been reduced to less than 11 percent by volume.

Evaluations have been made of the various inert gas systems available, such as nitrogen blanketing and the flue gas inert gas system. The flue gas inert gas system which uses the exhaust from the ship's powerplant appears to be the most practical and cost-effective system.

Many flue gas inert gas systems installed in the past experienced operational problems due to failure of components. It appears from current investigations that reliable flue gas components are now available and that such systems are operationally reliable.

The successful use of flue gas in inert gas systems depends on proper operation and maintenance and regular monitoring of tank atmosphere. Vessels fitted with these systems should continue practicing normal, good tanker safety practices.

Conclusions

The considerable research which has been conducted has provided knowledge necessary for increased safety during tank cleaning operations. This has included precautions to be followed when washing in an uncontrolled atmosphere and several acceptable approaches to controlling the atmosphere. A definite conclusion concerning the cause of the explosion of the three very large tankers in the latter part of 1969 has not been reached, but a number of possible ignition sources have been eliminated. Although most of the test work to date has addressed itself to the possibility that the explosions could have been caused by an elecrostatic associated ignition, any examination of a vessel after an explosion can rarely lead to a definitive conclusion concerning its cause. A examination of other accidents, such as collisions, groundings, and personal injuries all too frequently reveal the cause of the accident to be from the failure of a human to follow the norms and standards established in safe operation. The possibility of human error cannot be completely eliminated as the cause of the 1969 explosions although the similarity of the incidents tend to discount this probability.

It is recommended that the tank cleaning practices outlined in paragraph IV.B.4. be used when washing tanks in an uncontrolled atmosphere.

Test work is to be continued both in shore facilities and on board ship to confirm that those tank washing procedures which have been historically safe in any atmosphere are, in fact, safe. If the current trend of the data continues, it may lead to the modification of the limitations on the number of portable machines that may be used, the use of hot water, the use of chemicals, and recirculation.

Certain of the methods of controlling tank atmosphere have been investigated thoroughly while work on others continues. This report is not intended to advise for or against the use of any particular method. This is the responsibility of the individual tanker operator. The safe use of systems to control the tank atmosphere is dependent on reliable monitoring of the atmosphere at all times during washing. Precautions should be taken to ensure that the monitoring systems, themselves, do not introduce an unacceptable hazard.

The most important factor in the operation of any tank washing system is the proper training and motivation of vessel personnel to reliably carry out the recommended procedures of the individual tanker operator.

STUDY OF POSSIBLE IGNITION SOURCES

Electrostatic Research

An electrically charged mist is created by the high velocity water jets of tank cleaning machines. The considerable data that have been obtained during the past 2 years both in the United States and abroad have shown one circumstance in which this charged mist might lead to a hazardous discharge. Namely, an electrically isolated object in contact with the mist could accumulate charge and might subsequently release it in a single spark to ground.

Discharges directly between the charged mist and some part of the ship structure (especially a long probe grounded to the ship) have been observed and studied extensively both on board ship and in shore tanks. The evidence to date suggests strongly that such discharges are not incendiary.

Basic Concepts

The electrical conditions associated with a charged mist can be described in terms of the space charge density (coulombs per cubic meter), the resulting potential (volts), or the field strength (volts per meter). All may vary from point to point. However, it has been found experimentally that the charge density is fairly uniform.

The potential and field strength vary considerably throughout the tank. The potential is zero at the walls of the tank and on any grounded projection. The potential rises with increasing separation from the walls reaching its maximum in the center. The field strength is low near the center of the tank and increases as the walls are approached. The greatest field strength occurs at the terminus of grounded projections from the tank wall. The greater the distance between the terminus and the wall or the smaller its radius of curvature, the greater the field strength. These high field strengths are confined to the vicinity of the projection.

Instrumentation

Most measurements on ships have been of field strength since field meters are well developed and readily portable.

However, a charge density meter has been used on two shipboard tests and in several land-based studies.

The most commonly used field meter is cylindrical in shape with a diameter of about 3 inches. It measures the average voltage gradient at its end in the axial direction. The field meter is normally grounded and lowered into the tank through a deck opening. Since the reading is greatly dependent on the depth to which the meter is lowered as well as the configuration of the tank structure and the size of the meter, readings taken under differing conditions are not directly comparable unless the differing geometry is taken into account.

It has been shown by calculation that field strength measured by the standard 3 inch diameter axial field meter located away from the tank structure can be directly related to the space potential. The potential (in volts) that would exist at the meter location if the meter were removed is approximately equal to the measured field strength (in volts per meter) multiplied by 0.08 to 0.1 meters.

A conventional field meter causes considerable increase of the local field by its presence. A specialized meter which is not grounded has been developed to measure the undistorted field strengths within the tank. It has been used both on board ship and in a fog chamber. As expected, the measured values were generally quite low compared with field meter measurements.

The average charge density in a tank can be estimated from field meter readings. However, the field meter readings alone are not adequate for determining the charge distribution in a tanker compartment due to the complicated effect of tank geometry. A charge density meter has been developed for this purpose. It functions by drawing air from the tank through a filter where the mist is trapped and the accumulating charge detected by an electrometer. The filter assembly can be lowered to any desired depth through a standard deck opening. For use in flammable vapors, various safety features are incorporated to ensure that the equipment and especially the filter will not rise to hazardous potential.

Electrical discharges from the mist have been induced and measured by lowering a long probe into the tank. The probe is connected through a resistor to ground. The charge flow between the probe and mist can be observed with an oscilloscope as a voltage across the resistor provided suitable precautions are taken to ensure uniform high freqeuncy response. The nature and intensity of the discharges can be evaluated from the oscillograph trace.

Radio receivers have also been used to detect discharges anywhere within the tank. However, the sensitivity is largely indeterminant, and consequently such data are of limited value.

Test Results to Date

Extensive tests have been carried out both on tankers and in shore facilities. Although these tests are continuing, sufficient data have already been accumulated to establish the general trends and to permit some tentative conclusions:

a. Field strengths recorded by field meters in tankers have seldom exceeded 250 kilovolts/meter. The estimated maximum space potential is thus usually under 25 kilovolts.

b. Charge densities inferred from these figures are of the order of 10^{-8} coulombs per cubic meter. Direct measurement by a charge density meter has given a maximum of $17 \cdot 10^{-9}$ on one ship and $35 \cdot 10^{-9}$ on another smaller ship. Comparable measurements in a shore tank have not exceeded $65 \cdot 10^{-9}$ coulombs per cubic meter.

c. Charge density is homogenously distributed except possibly in the immediate vicinity of the water jet or a tank structure when corona is incipient. It remains homogenous after washing has stopped.

d. There has been no evidence of cloud to cloud discharges and the observed uniformity of charge distribution virtually excludes this possibility.

e. Discharges of the corona type have been observed from the mist to grounded probes in tankers. These are incipient and choke themselves off by producing a local accumulation of space charge of opposite sign.

f. Under more severe condition ($300 \cdot 10^{-9}$ coulombs per cubic meter) produced in a fog chamber by artificial means, more fully developed corona in the form of 10 cm. long streamers has been observed. However, even here no sparks have occurred.

g. Ignition experiments with corona discharges from a metal probe above a flat metal plate did not produce ignition at currents which were several orders of magnitude larger than those observed during shipboard tests.

h. Experiments have shown that an electrically isolated object in contact with the mist may become charged. If this charge collector (or part of it) is more or less conductive, it could, when brought near a grounded part of the ship, dump its charge into a single spark. This situation can be hazardous in a flammable atmosphere because of the concentration of the energy in the spark. An isolated body could arise in a number of ways. For example:

(1) A man lowering a rope or gas sampling hose into the tank. If his footwear or the deck coating is a good insulator, he could be charged by contact with the mist via the line. It has been shown that the rope or hose can, under shipboard conditions, have sufficient conductivity to permit charging of the man in a few seconds.

(2) A portable cleaning machine left hanging in the tank on a dry rope but with the hose containing the bond wire disconnected.

(3) Possibly, an object falling in the tank which may accumulate charge during its fall.

Based on work concerning isolated objects, the following safety precautions are recommended:

a. A portable cleaning machine should be kept

grounded by leaving the hose connections intact while it is in the tank.

b. Nothing should be introduced into a tank during or for 5 hours after washing unless the item in question is reliably grounded. The 5-hour delay may be reduced to one hour if the tank is ventilated by a blower after washing.

c. Care should be taken to prevent anything from falling into a tank.

d. Careful inspection of the tanks should be made to insure the removal of foreign objects after shipyard work in tank.

Future Work

Experimental work is continuing and further clarification of the static electricity problem is anticipated. In particular, further tests regarding isolated objects will be conducted aboard ship. A review of many shipboard tests suggests that the influence of water temperature and cleaning chemicals are not as great as was believed on the basis of early data. The effect of these parameters on charge production and dissipation is being investigated in a shore facility where a wide variety of washing conditions can be studied. It is hoped that an upper limit on possible charge density can be established. Field strengths measured on many shipboard tests were relatively independent of tank size. The matter of tank size is still being studied. Further study of the discharges produced in the fog chamber is planned to confirm that direct mist to ground discharges more severe than those which occur in tankers are unable to produce ignition by discharges from grounded projections.

Other Ignition Sources

Autoignition

Autogenous ignition can be described as those initial exothermic reactions of a flammable gas-air mixture which are self-initiated by the temperature of the reactants. The minimum temperature at which these reactions occur, termed the minimum autoignition temperature (MAT), varies mainly according to the constituency of the gas. For example, tests have shown (NACA TN3276 Properties of Aircraft Fuels, Lewis Flight Propulsion Labs, Cleveland, Ohio, August 1956) the MAT to be as low as approximately 470° F. for certain jet-fuels (kerosene type) and as high as 900° F. for low-volatility aviation gasoline both at atmospheric pressure. It can be assumed that the lower MAT (470° F.) would be representative of the values for some crude oils. While autoignition is a possible ignition source, it is widely recognized as such and is not believed to represent a significant hazard as far as the cargo tanks are concerned if currently accepted safety precautions are followed.

The technology with respect to autoignitions is well known and research directed specifically toward the tanker aspects of this source would add little to this basic knowledge. Therefore, specific work has not been undertaken. Temperatures at which autoignition occurs are not approached within the scope of normal tanker operations. However, it is important that the possible source continue to be recognized and the proper precautions continue to be exercised.

Pyrophoric Ignition

Pyrophoric ignition can be described as the initial rapid exothermic reactions which occur spontaneously when some materials come into contact with air. The material of concern relative to tanker operation is mainly pyrophoric iron sulphide. Records of tanker explosions do not indicate that pyrophoric ignition is a serious hazard under normal operating conditions although this source cannot be entirely eliminated from consideration. It is likely that sufficient oxygen is available in the tanks to prevent the pyrophoric materials from forming. Specific research directed toward pyrophoric ignition sources with respect to tankers is not being conducted but related work, mostly storage tank and refinery experience, is being followed closely.

Radio Induced Arcs

Under certain conditions it is possible for the radio transmitter to induce arcs on other parts of the ship above deck. The U.S. Navy has sponsored a number of studies of arcing during fueling of aircraft on board carriers. In one study aircraft were positioned within 20 feet of a radio antenna and were electrically bonded to the deck. The voltages between various parts of the aircraft and the deck were measured with an RF voltmeter. Voltages as high as 200 volts were observed when the antenna was radiating 500 watts at 11.8 MHz. Adding more bonding cables altered the voltage distribution but did not materially reduce the maximum voltage. Currents through the bonding wires were as high as one ampere.

The measured voltages never reached a level which could cause an incendiary spark to jump a fixed gap. However, it was demonstrated that a flammable vapor could be ignited by the arc formed on breaking contact. Ignition often occurred when the short circuit current exceeded 0.4 amperes and the steady open circuit voltage exceeded 120 volts.

It should be emphasized that these ignitions could be produced even though the aircraft was grounded at some other point. Radio frequency electromagnetic fields whose wave length is comparable to the dimensions of a grounded metal object can produce standing waves on the object. The voltage is zero where the object is grounded but can be sizable elsewhere.

In normal tanker operation the radio is not operated in port. Consequently, the risk of RF arcs should not arise during loading. When the ship is underway and tank cleaning, flammable vapors on deck and radio transmission may occur simultaneously.

At such times the rigging and other large structures should be grounded. In addition, they should be secured

so that intermittent contact cannot occur. Stays should be grounded at each end. In general, any structure whose length exceeds about one fifth of the wave length of the radio signal should be reviewed as a possible RF arcing hazard if not properly grounded and secured.

Smaller objects such as portable cleaning machines whose dimensions are substantially smaller than the wave length of the radio signal are not thought to present a significant RF arcing hazard. Washing machine hose could conceivably provide a length comparable to the radio wave length and thus be potentially hazardous if the RF equipment were operating. However, the close proximity of the hose to the deck makes RF pick up improbable. Radar gear, although it operates at short wave length, is aimed above deck level and is not a probable cause of RF arcs on deck.

ANNEX
ATTAINING A TOO LEAN ATMOSPHERE

General

The following supplements paragraphs IV.B.7 through IV.B.11 setting forth means to achieve a too lean atmosphere.

Yo-Yo Cleaning

Yo-Yo cleaning is the removal of liquid residues and displacement of hydrocarbon vapors by ballasting. The general procedures are as further set forth.

Flushing, Ballasting, Deballasting

To achieve a tank atmosphere where the hydrocarbon content has been reduced to a level that permits machine washing to be undertaken below the Lower Flammable Limit (LFL), one operator devised a method comprising repetitive bottom flushings combined with total ballasting and ventilating cargo tanks.

By this method, most of the crude oil remaining in the cargo tanks after stripping is removed to a slop collecting tank. The oil that still clings to the structure in the tanks will have been weathered sufficiently so that very little gas regeneration occurs when tank washing is started.

Basically, the operation involves the following steps:

a. Fill cargo tanks by gravitating from the sea to a depth of 4–5 feet to submerge bottom longitudinals.

b. Strip oily water from the cargo tank to slop tank, or to another cargo tank that has been designated to hold slops.

c. Repeat steps a and b, 6–10 times.

d. Ballast to the deckhead and hold the tank overnight to allow oil residues to surface.

e. Deballast, stripping the floating oil to the slop tank.

Occasionally, it may be necessary to repeat steps a through e, but experience has shown that to prepare a tank for machine tank washing, one cycle will suffice.

Ventilation

Following the flushing/ballasting/deballasting cycle, cargo tank atmosphere is usually found well below the LFL.

At that point, ventilation of the tank by either the central blower system or by individual deck blowers is advisable as some gas regeneration can occur if the tank is left standing for an extended period. The ventilation helps to prevent further regeneration.

Monitoring of Gas Concentrations

Throughout the tank washing operation, frequent monitoring of the tank atmosphere is important if it is desired to keep the atmosphere below a predetermined concentration level.

To that end, several companies have devised methods that would insure them that a fresh gas sample is always available at the deck level.

In principle, these consist of groups of three to four plastic hoses bundled together that terminate at various levels in tanks. On deck, the hoses are manifolded to an air-driven eductor that will provide a continuous flow through all the sampling hoses. Testing of the flow can then be done by either a portable or semi-fixed instrument depending on the operator's preference.

It has been found that with a continuous monitoring system, control of the tank atmosphere is more reliable and, therefore, the limits at which tank washing has to be interrupted and additional ventilation will be required can be set to a somewhat higher level. This will allow a faster operation.

Advantages and Disadvantages

The bottom flushing, ballasting, and ventilating method to prepare cargo tanks for machine tank washing provides good controls over tank atmospheres. After flushing and filling the tanks, the crude oil residue contains very few light end components. Thus, no sudden atmospheric changes take place during machine washing. Any increases in hydrocarbon vapor concentration can be monitored accurately over a period of time before they approach previously determined cutout limits.

The method is time consuming because large quantities of ballast water have to be handled. The time factor, however, is not deterrent to using the method when ballast voyages are long. But the heavy ballast handling puts additional load on the cargo pumps and associated components resulting in a faster wear down of the equipment.

Skim-Cleen Method of Cleaning

The Skim-Cleen method of cleaning is the removal of oil liquid residue and displacement of hydrocarbon vapors by ventilation. It is also used to produce a "too lean" atmosphere in a tank by removing the gas-producing oil

residue from the tank before washing. Skimming devices have been developed and are being improved for removing these residues from the ballast water.

The following three-step procedure is normally used:

a. Ballast water is pumped into the dirty tank and oil residues float to the surface.

b. The resultant layer of oil is skimed off and transferred to another compartment. Ventilation is continued throughout this operation.

c. The tank is deballasted with ventilation continuing throughout the operation.

A number of operators have been experimenting with the use of skimmers to evaluate their efficiency. Variations in test results can probably be explained by differences in weather conditions, types of crudes, previous tank cleaning history, and tank construction.

Caution

Operators experimenting with these systems are cautioned about the possible regeneration of gas when washing commences, and the need for intensive gas concentration monitoring. ⚓

Merchant Marine Safety Publications Revised/Published

In recent months several Coast Guard Merchant Marine Safety pamphlets have been revised, and a new one has been published. While these events are noted as they occur on the inside back cover of each issue of the *Proceedings*, it is felt that many readers might overlook the fact that a particular publication has been updated. Therefore it is pointed out that the following publications have recently been revised and are available from local Coast Guard Marine Inspection Offices around the country.

CG–108, Rules and Regulations for Military Explosives and Hazardous Munitions, revised through April 1, 1972.

CG–169, Rules of the Road, International—Inland, revised through August 1, 1972.

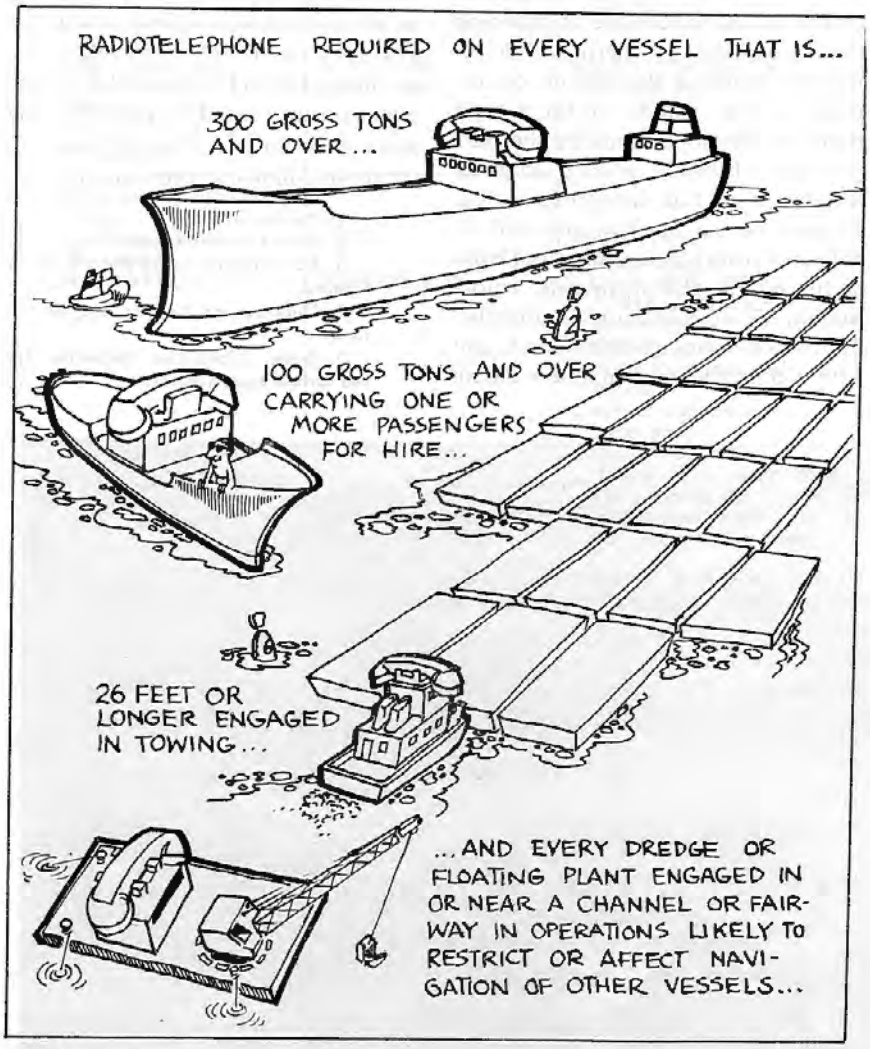
CG–172, Rules of the Road—Great Lakes, revised through July 1, 1972.

CG–184, Rules of the Road—Western Rivers, revised through August 1, 1972.

CG–191, Rules and Regulations for Licensing and Certification of Merchant Marine Personnel, revised through June 1, 1972.

CG–239, Security of Vessels and Waterfront Facilities, revised through March 1, 1972.

CG–320, Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf, revised through July 1, 1972.



Pictured above is one example of the illustrations contained in the new Merchant Marine Safety Publication, "Bridge-to-Bridge Radiotelephone Communications," CG–439.

In addition, a new publication numbered CG–439 and entitled Bridge - to - Bridge Radiotelephone Communication, Law and Regulations has recently been published. It includes the Bridge-to-Bridge Radiotelephone Act and regulations promulgated under that law by the Coast Guard and by the Federal Communications Commission.

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INTERNATIONAL ICE PATROL 1973

IN FEBRUARY or March 1973, depending upon iceberg conditions, the International Ice Patrol will commence its annual service of guarding the southeastern, southern, and southwestern limits of the regions of icebergs in the vicinity of the Grand Banks of Newfoundland for the purpose of informiog passing ships of the extent of this dangerous region. Reports of ice in this area will be collected from passing ships and from flights by Ice Patrol aircraft. Information on ice conditions is provided by the Ice Patrol at 0000 G.m.t. and 1200 G.m.t. each day in an Ice Patrol Bulletin which is sent out by radio and landline circuits. (See *Table 1.*)

All shipping is requested to assist in the operation of International Ice Patrol by reporting all sighting of ice at once to COMINTICEPAT via the radio stations listed in the following section. When reporting ice please include the following information:

1. Position of ice.
2. Size of ice (for icebergs).
3. Concentration of ice (for sea ice, in eighths).
4. Thickness of ice (for sea ice, in feet).
5. Other information requested for sea surface temperatures.

Silent but deadly, this iceberg will be marked and its drift plotted by computer as it enters areas of shipping.

In addition to ice reports, sea surface temperature and weather reports are of importance to the Ice Patrol in predicting the drift and deterioration of ice and in planning aerial patrols. Shipping is urged to make sea surface temperature and weather reports to the Ice Patrol every 6 hours when within latitudes 40° to 50° N. and longitudes 42° to 60° W. Ships with but one radio operator should prepare the reports every 6 hours as requested and hold them for transmission when the radio operator is on watch. When reporting, please include the following:

1. Ship position.
2. Course and speed.
3. Visibility.
4. Air and sea surface temperature.
5. Wind direction and speed.

It is not necessary to make the above report if the ship is making routine weather reports to METEO WASHINGTON.

Radio Stations

Ice sightings, weather, and sea surface temperature should be reported to COMINTICEPAT through Coast Guard Ocean Station vessels, Coast Guard Stations, and, if unable to work U.S. Coast Guard Stations, Canadian Coastal Radio St. Johns/VON on the frequencies indicated on *Table 2.* Merchant ships calling to transmit Ice Patrol traffic are requested to use the regularly assigned international call sign of the station being called; however, Coast Guard stations will be alert to answer NIK, NIDK, or NJN calls if used.

Gulf of St. Lawrence Information

Ice information services for the Gulf of St. Lawrence, as well as the approaches and coastal waters of

Newfoundland and Labrador, are provided by the Canadian Department of the Environment during the approximate period December to late June. Ships may obtain ice information by contacting Ice Operations Officer, Sydney, Nova Scotia via Sydney Marine Radio (VCO) or Halifax Marine Radio (VCS). Details of the service are available in "Guidance to Merchant Shipping Navigating in Ice in Canadian Waters," published by the Marine Operations Branch, Ministry of Transport, Ottawa, Canada.

Warnings

1. Shipping is reminded that in spite of the best efforts of the Ice Patrol to prevent such occurrences, icebergs have and will drift unnoticed into the usual shipping routes in the area of the Grand Banks. The positions of icebergs in the Ice Bulletin are updated for drift at 12 hour intervals. However, it is stressed that after about 5 days the positions estimated by drifting are very unreliable. Date of an iceberg sighting is indicated in the Ice Bulletin.

2. In general, only icebergs south of about 48° N. are included in the Ice Bulletin. In the event there are large numbers of icebergs south of 48° N., the Ice Bulletin will carry the positions of only those icebergs near the limits of ice and isolated icebergs or iceberg groups.

3. Carefully conducted tests by the Ice Patrol have proven that radar cannot provide positive assurance of iceberg detection. Since sea water is a better reflector of radar signals than ice, an iceberg or growler inside the area of sea return on the radar scope may not be detected. The *average* range of radar detection of a dangerous growler, if detected at all, is only 4 miles. While radar remains a valuable aid for ice detection, its use cannot replace the traditional caution exercised in a passage across the Grand Banks during the ice season.

BROADCASTS OF THE ICE PATROL BULLETIN

RADIO STATION	TIME OF BROADCAST (GMT)	FREQUENCIES (kHz)
CW Broadcasts		
Coast Guard Radio Boston/NIK	0018 1218	5320, 8502 8502, 12750
Coastal Radio St. Johns/VON	0000 and 1330	478
Maritime Command Radio Mill Cove/CFH	0130 and 1330	4356.5, 6449.5, 12984, 17218.4, 22587.
Naval Radio Washington/NSS	0430 and 1700	88.0 (0430 only), 185.0, 5870, 8090, 12135, 16180.
Voice Broadcasts		
Coast Guard Radio Boston/NMF (Western North Atlantic High Seas Broadcast)	0130, 1330 0200, 1400	8765.4 (8764.0) USB 8764.0 DSB
Radiofacsimile Broadcasts		
Coast Guard Radio Boston/NIK	1600	8502, 12750 (drum speed 120)
CANMARCOM/CFH	0300 and 1500	133.15, 4271, 9890, 13510, 17560 (drum speed 120). (Primarily sea ice in Gulf of St. Lawrence and North. Limits of icebergs sometimes given.)
Radio Bracknell/GFE	1400	4782, 9203, 14436, or 18261 (drum speed 120) (N. Atlantic Ice Obs.)
Radio Quickborn/DGC	0905 (Repeated at at 2145) (Weekdays only)	3695.8 (drum speed 120) (W. Atlantic Ice Chart)
Radio Quickborn/DGN	0905 (Repeated at 2145) (Weekdays only)	13627.1 (drum speed 120) (W. Atlantic Ice Chart)
Special Broadcasts		
Coastal Radio St. Johns/VON	As required when icebergs are sighted outside the limits of ice between regularly scheduled broadcasts.	Preceded by International Safety Signal (TTT) on 500 kHz.

Table 1

1972 International Ice Patrol

Last year an estimated 1587 icebergs drifted south of 48° latitude, forcing trans-Atlantic shipping south of normal trade routes. The ice season, which ended on September 4, was the longest on record and was only the fifth year since 1900 that more than 1,000 icebergs have entered the North Atlantic Ocean below the 48th parallel.

Extremely cold winter temperatures over the coastal waters of Newfoundland and Labrador coupled with strong westerly and northwesterly winds contributed to the record season. Heavy sea ice that developed during the severe winter weather also lengthened the season by protecting the bergs from erosion by waves.

Sea water temperatures were also well below normal. Until mid-June the sea water temperature at the southern tip of the Grand Banks was only a few degrees above freezing, allowing large icebergs to survive several weeks along the normal shipping tracks before melting.

The southernmost iceberg is estimated to have drifted to the approximate latitude of Philadelphia before melting, while the easternmost iceberg was tracked to 700 miles east of Newfoundland. During mid-May, when icebergs were most widely dispersed to the south and east, the region of icebergs south of 48° N. latitude (the northern boundary of North Atlantic shipping routes) covered over 150,000 square miles of ocean.

During late April icebergs began to drift south of 42° N. latitude, causing the Commander, International Ice Patrol to initiate a surface patrol in the vicinity of the southernmost bergs. The Coast Guard Cutters "riding herd" on the drifting bergs broadcast warnings to shipping in the area, especially at night and during the frequent periods of fog. Though the surface patrol ended in July, the Ice Patrol continued surveillance with C–130 aircraft as had been done through the entire season.

Ice reports from merchant vessels, relayed through the Coast Guard Radio Stations, or Canadian Coastal Radio Station St. John's are received at the offices of the International Ice Patrol in New York. There the reports are recorded and entered into a computer which calculates the iceberg drift rate based on the predicted surface winds and the estimated surface current. This computer is the same one that Automated Mutual-assistance Vessel Rescue System (AMVER) uses for its automated plot.

Comments concerning operation of the Ice Patrol, particularly concerning the effectiveness of the times and frequencies of radio transmissions, are of much interest to the Ice Patrol and are earnestly solicited. Comments may be directed to Commander, International Ice Patrol, Building 110, Governors Island, New York, N.Y. 10004.

CALLING AND TRANSMISSION OF TRAFFIC

Purpose	Frequencies which should be used
Calling	500 kHz (If 500 kHz is being used for distress traffic then 512 kHz may be used as supplementary calling frequency). 2182 kHz (voice). Assigned HF (CW) calling frequencies.
Working Frequencies *Station*	
Ocean Station Vessels 4YB, 4YC, 4YD, 4YE	466 kHz (CW), 2760 kHz (voice)
Ocean Weather Station Hotel (4YH)	466 kHz (CW), 2670 kHz (voice)
Coast Guard Radio Stations	
Boston—NMF	472, 8465, 22487.5 kHz (CW)
New York—NMY	486 kHz (CW), 2670 kHz (voice)
Norfolk—NMN	466, 8465, 12718.5, 17002.4 kHz (CW) 2670 kHz (voice)
Canadian Coastal Station	
St. Johns—VON	478 kHz (CW)

Table 2

ICEBERG IDENTIFICATION

SIZE	HEIGHT		LENGTH	
	Feet	Meters	Feet	Meters
Growler	Less than 4	Less than 1	Less than 20	Less than 6
Bergy Bit	4–20	1–6	20–50	6–15
Small Iceberg	20–50	6–15	50–200	15–61
Medium Iceberg	50–150	15–46	200–400	61–122
Large Iceberg	150–250	46–76	400–700	122–213
Very Large Iceberg	More than 250	More than 76	More than 700	More than 213

Shape	Description
Blocky	Steep sides with flat top. Very solid. Length-Height ratio less than 5–1.
Drydock	Eroded such that a Large U-shaped slot is formed with twin columns. Slot extends into or near waterline.
Dome	Large round smooth top. Solid type iceberg.
Pinnacled	Large central spire(s) or pyramid(s) dominating shape.
Tilted-Blocky	Blocky iceberg which has tilted to present a triangular shape from the side.
Tabular	Flat topped iceberg with length-height ratio greater than 5–1.

Table 3

COAST GUARD PROMULGATES NEW POLLUTION REGULATIONS

New regulations published by the Coast Guard in the Federal Register of December 21, 1972, will have a significant impact on the men, equipment, vessels, and facilities involved to any great degree with the storage, use, or transfer of oil. The new rules, issued as two documents under the authority of the Federal Water Pollution Control Act (as amended), are designed to reduce the accidental oil spills which occur during normal vessel operations.

Though it is the "high-energy" spill through collision or grounding which garners the headlines and causes locally severe environmental damage, significant and continuous harm is worked on the environment by the minor spills that occur during routine transfer operations. Summary statistics for 1971 show that 8,736 discharges of oil or other polluting substances were reported to or detected by the Coast Guard, and that 7,912 of these occurred in coastal waters under the Coast Guard's responsibility. Most of these spills and discharges were due to faulty eqnipment, improper procedures, or personnel error.

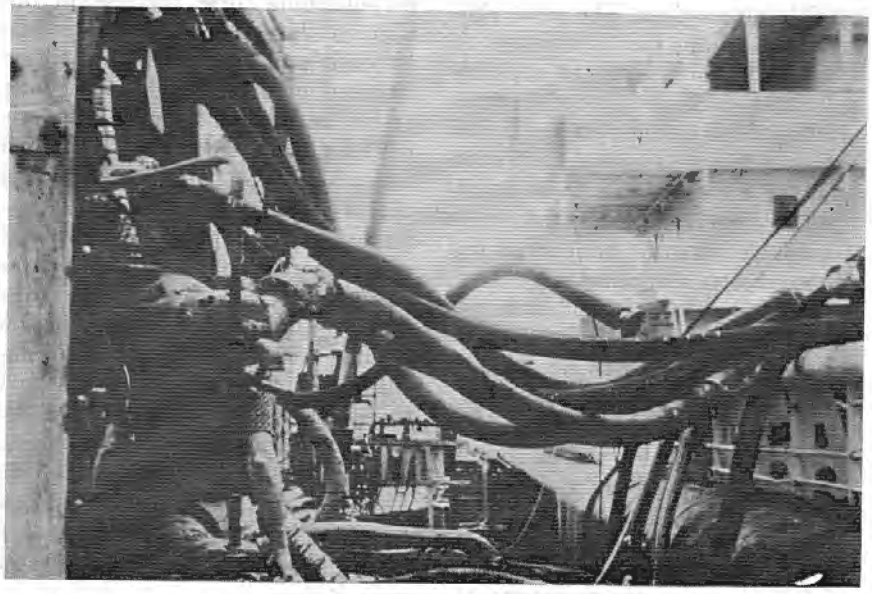
The new regulations were written to combat these "low energy" discharges on many fronts. Merchant marine officers and seamen are required to have additional knowledge of oil pollution and of laws, regulations, and procedures to prevent oil pollution; and the vessels they man will be equipped or designed to minimize oil pollution. More frequent dry-docking of tank barges in fresh water service is also required by the regulations. Shoreside operators of oil transfer facilities are going to have to meet certain new requirements in the design, equipment, and operation of their plants.

Final publication of the rules followed 3 months of public evaluation and subsequent Coast Guard revision of the requirements as they were proposed in December 1971. Over 200 written comments were received from the general public, State and local governments, and Coast Guard personnel during the course of the rulemaking process. In light of those comments and testimony heard at a public hearing held on February 15, 1972, major changes have been made.

SHORESIDE OPERATIONS

Elimination of the "permit system" outlined in the proposed rules is perhaps the greatest change to be found in the final regulations. Under the "permit system", operators of oil transfer facilities would have been required to obtain permission to conduct operations. As a result of the comments received on this issue, the regulations have been changed to require each facility to file a "letter of intent" to operate, which would include the name of the operator, facility, and its location. For mobile facilities, such as tank trucks, the captain of the port must be advised of specific transfer location at least 4 hours before each transfer. Initial filing of letters for existing facilities must be completed by July 1, 1973.

Coupled with the letter of intent to operate is the requirement for facility operators to permit the Coast Guard to inspect their facilities, to maintain a record of all inspections conducted by the Coast Guard, and to conduct any tests which the Coast Guard deems necessary to determine the facility's compliance with the regulations. If a captain of the port determines that conditions found at a facility constitute an undue threat to the



This tangle of loading hoses indicates the complexities in the transfer of oil.

environment, he may order the suspension of the oil transfer operations.

VESSELS

Vessels, too, may be required to suspend operations if the captain of the port determines that continuation of oil transfer would be hazardous to the environment. It is important to note that the pollution prevention regulations for vessels are now applicable to 12 miles offshore, in accordance with the provisions of the Federal Water Pollution Control Act.

Because of many problems which existing vessels would have in complying with the proposed provision concerning fuel oil discharge containment, it has been changed to allow small portable spill containment systems on existing vessels. All newly constructed vessels are required to have an installed deck spill containment system to retain small spills and overflows that occur during vessel fueling operations.

As a result of the comments received during the rulemaking process concerning requirements for double wall construction, the proposed provisions are being held in abeyance. The Coast Guard has, in cooperation with the Maritime Administration, begun an 18-month study of the need for double hull construction, its costs and possible alternatives. The new regulations also limit the "prohibited oil spaces" provision only to self-propelled vessels. Since many of the technical details of defining the prohibited spaces on a barge are dependent upon much of the same data to be developed by the Coast Guard-Maritime Administration study, adoption of this proposed section is being delayed.

Inspection of vessels and examination of personnel are also affected by the new rules. Comments on the wording of the proposed regulations concerning drydocking resulted in a change to clarify that vessels regardless of service need not be routinely docked more frequently than every 24 months. It is also emphasized in the preamble to the document that the effective date of July 1, 1974, for the section means that by that date all tank vessels in fresh water service must be on the 3-year cycle for drydocking. Thus, on July 1, 1974, all U.S. tank vessels, except those double hulled vessels meeting the internal inspection exemption, must have been drydocked since June 30, 1971.

A POLLUTION REGULATION TIMETABLE

June 1, 1973—By this date, all letters of intent must be filed by operators of shoreside oil transfer facilities. The letter must include:

1. The name, address, and telephone number of the operator.
2. The name, address, and telephone number of the facility, or, in the case of a mobile facility, the dispatching office.
3. Except for mobile facility operations, the geographical location of the facility with respect to the associated body of navigable waters.

June 30, 1973—All hose assemblies and loading arms manufactured after 30 June 1973 must meet the requirements of § 154.500 and § 154.510 respectively in order to be used after June 30, 1974.

July 30, 1973—After this date, an examination in pollution abatement will be required for an original, raise of grade, or first renewal of a merchant mariner's license.

July 1, 1974—By this date, all the remaining provisions are to be considered effective. All tank vessels in fresh water service must be on the 3-year cycle for drydocking. With the exception of double hulled vessels meeting the internal inspection exemption, all U.S. tank vessels must have been drydocked since June 30, 1971.

PERSONNEL

Because of the unanticipated delays in publishing these regulations, the effective date after which an examination in pollution abatement will be required for an original, raise of grade or first renewal of a merchant mariner's license is now July 30, 1973. The Coast Guard will publish examination preparation material and sample examination questions at least 120 days prior to instituting a pollution examination for license renewal. That portion of the renewal examination dealing with statutes and their implementing rules will be "open book". Publications covering these will be available in all license examination offices for use by the applicants. The examination subjects concerning pollution will initially be basic and will be continued and expanded as experience dictates.

Numerous comments, both pro and con, were received in response to the proposed increases in scope of merchant seamen examinations to include additional knowledge of marine pollution and its prevention. It is emphasized that the pollution abatement examination for license renewal is *only for the first renewal* after publication of the regulations and is intended to insure that all licensed personnel are knowledgeable on the subject. The tests will be scaled to suit the license and are designed to familiarize every seaman with the pollution problem, the penalities that may be imposed for violating the law, what constitutes a violation of the law, and a knowledge of good practices to prevent pollution.

This is only a summary of the major provisions of the new rules; for complete information on these new regulations and personnel requirements, consult the Federal Register of December 21, 1972. Copies can be obtained on request from the local Coast Guard Captain of the Port, Marine Inspection Office, or U.S. Coast Guard (GWEP), 400 Seventh Street, SW., Washington, D.C. 20590.

COAST GUARD RULEMAKING

(Complete as of 1 January 1973)

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
1971 PUBLIC HEARING							
PH 9–71 Fibrous glass-reinforced plastic construction of small passenger vessels	2–24–71	3–29–71	5–15–71				
(Second Notice of Proposed Rulemaking due to revisions of original proposal)	4–6–72	None	5–8–72			12–8–72	1–11–72
1972 PUBLIC HEARING							
Tailshaft inspection and drawing (67–71, 4–71)	3–1–72	3–27–72	4–3–72	X			
Stability-wind heel criteria for cargo and miscellaneous vessels (43–71)	3–1–72	3–27–72	4–3–72	X			
Definition of international voyage (12–70)	3–1–72	3–27–72	4–3–72	X			
Portable foam firefighting equipment—tank vessels (17–71)	3–1–72	3–27–72	4–3–72	X			
Visual acuity requirements, original licenses (23–71)	3–1–72	3–27–72	4–3–72	X			
Visual acuity supplement	12–8–72	On request	1–12–73	X			
ANCHORAGE REGULATIONS							
Casco Bay, Maine	6–16–72		7–19–72	X			
Henderson Harbor, N.Y.	6–28–72		8–1–72	X			
St. John's River, Fla. (CGFR 71–162)	12–22–71		1–31–72	X			
San Francisco Bay Area (CGD 72–78)	4–28–72	5–24–72 San Francisco	5–27–72			12–1–72	1–1–73
San Juan Harbor, P.R. (CGFR 72–12)	2–1–72		3–4–72	X			
Willington River, Ga. (CGFR 71–153)	11–25–71		12–27–71	X			
San Diego Harbor (CGD 72–228)	12–5–72	None	1–8–73	X			
Hampton Roads, VA (CGD 72–232)	12–5–72		1–9–73	X			
Juan De Fuca, Wash. (CGD 72–233)	12–5–72		1–9–73	X			
Hampton Roads, VA (CGD 72–239)	12–10–72		1–11–73	X			
BOATING SAFETY (GENERAL)							
Numbering and casualty reporting (CGD 72–54) corrected; F.R. of 11–17–72	4–19–72	5–17–72	5–31–72			10–7–72	7–1–73
Revocation of Parts 171, 172, and 173 of Subchapter S of Title 46 (CGD 72–176)						10–7–72	1–1–73
Personal Flotation Devices (CGD 72–172, 120, 163)	10–6–72	11–20–72					
BRIDGE REGULATIONS							
Bear Creek, Md. (CGFR 72–17)	2–2–72		3–7–72	X			
Chattahoochee River (CGFR 71–166)	12–29–71	1–26–72 Florida	1–27–72	X			
Idaho State Memorial Bridge, Clearwater River, Lewiston, Idaho (CGFR 71–169)	12–29–71	2–1–72	2–1–72	X			
Interstate I–90 at Lake Washington (CGFR 71–168)	12–21–71	1–27–72 Washington	1–27–72	X			
Three Mile Creek (CGD 72–217)						11–4–72	11–15–72 through 1–13–72
Humble Canal, La. (CGD 72–227)						11–28–72	1–29–73 through 3–11–73

Coast Guard Rulemaking—Continued

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
North Fork, Mokelumne R., Calif. (CGD 72–218)	11–8–72		12–12–72	X			
Raritan R., N.J. (CGD 72–219)	11–8–72	12–14–72	12–29–72	X			
Nansemond R., Va (CGD 72–244)	11–11–72		12–15–72	X			
Biscayne Bay, Fla. (CGD 72–230)	11–28–72		1–2–73	X			
John Day R., Blind Slough, Clatskanie R., Oregon (CGD 72–231)	11–28–72		1–2–73	X			
Oakland Inner Harbor Tidal Canal, Calif., (CGD 72–225)	11–17–72		12–22–72	X			
Nanticoke, Del. (CGFR 71–142)	11–24–71		12–24–71	X			
Ogden Slip, Chicago, Ill. (CGFR 72–16)	2–2–72		3–7–72	X			
Sacramento River, Cal. (CGFR 71–165)	12–29–71		2–7–72	X			
Union Pacific RR Co., Columbia River (CGFR 71–167)	12–29–71	2–23–72 Washington	1–27–72	X			
Mare Island, Cal	6–30–72		8–7–72	X			
Ohio River at Huntington	6–10–72	7–13–72	7–27–72	X			
Ortega River, Fla	6–21–72		7–25–72	X			
Alabama River, Ala. (CGD 72–159P)	8–22–72		9–26–72	X			
Clear Creek, Tex. (CGD 72–165P)	8–26–72		10–3–72	X			
New River, Fla. (CGD 72–170P)	8–30–72		10–3–72	X			
Pompano Beach, Fla. (CGD 72–158P)	8–22–72		9–26–72	X			
St. Lucie River, Fla. (CGD 72–168P)	8–26–72		10–3–72	X			
West Palm Beach, Fla. (CGD 72–167P)	8–26–72		10–3–72	X			
Back Bay of Biloxi, Miss. (CG 72–173R)						9–7–72	10–2–72 through 3–3–73
Great Canal, Satellite Beach, Brevard County, Fla. (CGD 72–175PH)	9–13–72	10–30–72	11–13–72	X			
Debbies Creek, Manasquan, N.J. (CGD 72–138R)	9–14–72		10–24–72	X			
Drawbridge Operations:							
AIWW, Mile 342, Fla.; Drawbridge Operations (CGD 72–190P)	9–30–72		11–1–72	X			
Barnegat Bay, N.J. (CGD 72–211)	10–31–72		12–5–72				
Middle Branch, Patapsco River, Md. (CGD 72–212)	10–31–72		12–5–72				
Alabama River, Ala. (CGD 72–203)	10–14–72		11–20–72	X			
Ewing Narrows, Harpswell, Me. (CGD 72–205)	10–17–72	11–21–72	12–6–72				
White River, Ark. (CGD 71–149R)						12–2–72	1–2–73
Richardson Bay, Ca. (CGD 72–30)						12–2–72	2–14–73 through 10–6–73
San Joaquin, Ca. (CGD 72–94)						12–2–72	Extend previous rule to 12–31–72
Hudson R., NY (CGD 72–204R)						12–13–72	On Pub
St. Croix R., Minn. (CGD 72–246)						12–22–72	4–15–73
Doctors Pass, Naples, Fla. (CGD 72–242)	12–16–72	1–25–73	2–15–73	X			
Wabash R., Ill. (CGD 72–241)	12–16–72	None	1–23–73	X			
HAZARDOUS MATERIALS							
Etiologic agents (CGFR 71–170)	1–7–72	3–28–72	4–4–72			12–13–72	3–31–73
Radioactive materials (CGFR 71–136)	11–20–71	2–22–72	2–29–72	X			
Radioactive materials packages (CGD 72–91)	5–24–72	6–20–72	6–27–72	X			
Compressed Gas Cylinders (CGD 72–115PH)	8–31–72	9–28–72	10–2–72	X			
Dangerous Cargoes—Dichlorobutene (CGD 72–162PH)	8–30–72	10–24–72	10–31–72	X			
Dichlorobutene, Corrected, F.R. 9–20–72, Hazardous Cargoes (CGD 72–162PH)	8–30–72	10–24–72	10–31–72	X			
Etiologic Agents—Supplemental Notice (CGD 72–148PH)	8–9–72	9–5–72	9–12–72	X			

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
Dangerous Cargoes—Phosphorus Pentasulfide (CGD 72–171PH)	9–6–72	10–24–72	10–31–72	X			
Dangerous Cargoes; Nitrogen Tetroxide (CGD 72–34)						11–11–72	2–16–73
Certification of Cargo Containers for Transport under Customs Seal (CGD 72–139)	11–17–72		12–19–72	X			
Transportation of Corrosive Liquid Cargo (CGD 71–53)	6–11–71	9–21–71 and 5–25–72	5–31–72			12–2–72	6–30–72
Metal Borings, Shavings, Turnings & Cuttings (CGD 72–229)	12–5–72	1–11–73	1–15–73	X			
Exemption to Etiologic Agents Requirements (CGD 72–226)	12–13–72	1–23–73	1–30–73	X			
MARINE ENVIRONMENT AND SYSTEMS (GENERAL)							
Oil pollution prevention (CGFR 71–160, 161)	12–24–71	2–15–72	4–21–72	X		12–21–72	7–1–74
Atlantic Intracoastal Waterway, Vero Beach, Fla. (CGD 72–155P)	8–16–72		9–19–72	X			
Passing Midchannel Buoys (CGD 72–160)						12–2–72	12–31–72
MERCHANT MARINE SAFETY (GENERAL)							
Buoyant devices, special purpose water safety (CGFR 72–5)	1–29–72		3–15–72	X			
Documentation ports (CGFR 72–19)	2–4–72		4–4–72			12–14–72	1–15–73
Fire extinguishers, marine type portable (CGFR 72–36)	3–9–72	4–18–72	4–24–72	X			
Incombustible materials (CGFR 72–47)	3–9–72	4–18–72	4–24–72	X			
Oceanographic vessels, fire main systems (CGFR 72–20)	2–4–72		3–19–72	X			
Washroom and toilet facilities (CGFR 72–4)	1–15–72		3–20–72	X			
Water lights, floating electric (CGFR 72–48)	3–9–72	4–18–72	4–24–72	X			
Great Lakes Maritime Academy, List as a Nautical School-Ship (CGD 72–92P)	8–9–72		9–15–72	X			
Revocation of Fernandina Beach as a Port of Documentation (CGD 72–75P)	8–9–72		9–12–72			12–14–72	1–15–73
Ship's Maneuvering Characteristics Data (CGD 72–132PH)	8–22–72	9–28–72	10–13–72	X			
Disclosure of safety standards (CGD 72–187)	10–31–72		12–4–72	X			
Unmanned Barges; hull construction (CGD 72–130)	10–31–72	12–19–72	12–29–72	X			
Great Lakes Bridge-to-Bridge Exemption (CGD 72–223)	11–11–72	12–4–72	12–15–72	X			
Marine Engineering Systems and Components (CGD 72–206)	11–17–72	12–12–72	12–20–72	X			
Remote Valve Controls (CGD 72–57)	11–17–72		12–19–72	X			
Update of Examination Requirements for Second and Third Mate (CGD 72–151)	11–16–72		1–1–73	X			
Bridge-to-Bridge Exemption, Great Lakes (CGD 72–223)	11–11–72	12–4–72	12–15–72			12–28–72	1–1–73
Towboat Operator Licensing (CGO 72–132PH)	8–11–72	9–13, 20, 26, 27–72	10–17–72	X			

NOTE: This table which will be continued in future issues of the Proceedings is designed to provide the maritime public with better information on the status of changes to the Code of Federal Regulations made under authority granted the Coast Guard. Only those proposals which have appeared in the Federal Register as Notices of Proposed Rulemaking, and as rules will be recorded. Proposed changes which have not been placed formally before the public will not be included.

SAFETY AS OTHERS SEE IT

Unsafe Habits Endanger All Who Work at Sea

What causes the most common shipboard accidents?

Unsafe working habits, for the most part. Try this checklist of possible causes for accidents, and see if any of them apply to you:

Do you fail to look where you walk on ship, when on and off duty?

Do you let your hands and feet remain in unsafe positions, such as door frames or open hatch covers?

Do you lift or handle material with poor body posture, certain in time to pull a muscle or produce hernia?

When you climb or descend steps on board, do you forget to use hand rails? Do you also neglect to watch to see if grease or water has made the treads slippery?

Do you use defective tools? Wrenches with spread jams, pliers with worn teeth, chipped ends of screwdrivers and loose hammerheads are examples of defective tools that can fail in use and cause injuries to the user.

Do you use your hands instead of hand tools, thinking to save time and effort?

Do you use the wrong tool for a job, hoping to make do or cut corners?

Do you work too fast for safety, under the prevailing conditions of the job?

Do you forget to wear personal protective equipment—gloves, goggles, helmet, supporters, safety shoes?

Do you wear improper clothes while working, such as scarves, ties or long sleeves that could become caught in machinery? If you have to work in a hot, constricted area, do you wear too little to protect you in case of an accident? ⚓

—Courtesy Safety Valve *of District 2 MEBA*

Improvising

One dictionary defines the word improvise to mean "unprepared"; "to make, provide, or do with the tools and materials at hand, usually to fill an unforeseen and immediate need."

Many old sea stories have been written on how seamen had improvised in emergency situations, such as a ship coming into port with a "jury mast" or "jury rudder."

When proper precautions are not followed, a lot of things can happen, oftentimes they are bad. For example, the deck force was chipping and painting booms and had rigged two pieces of 1" dunnage from a winch to the top of deck cargo, a span of about 6 feet. They used this improvised walkway most of the morning until knocking off for lunch when one of the boards gave way and a seaman fell to the deck several feet. He was seriously injured.

Occasionally, seamen are observed improvising on the job by using a screwdriver in place of a chisel, a wrench instead of a hammer, a box or drum to stand on in lieu of a well-secured ladder. This kind of improvising is dangerous and unnecessary. When we start to work with insufficient or incorrect tools or equipment, we are only asking for trouble. Instead of leaving the job to get the proper tools, we attempt to pick up what is handy, and the next thing we have is an accident. Incorrect and unsafe tools are equally bad.

When we recognize the dangers of improvising, then we must put this knowledge to work. Don't take chances, whether it be yourself or a shipmate, as soon as we see improvising on the job it is our duty to stop it at once.

Any form of improvising has no place on a ship where safety and good seamanship are the watchword. Planning ahead will prevent improvising, and remember that no job is so urgent that it can't be performed safely.

Let's leave the "jury rig" for emergencies where a seaman's knowhow to improvise may be necessary. ⚓

Safety Bulletin Lykes Lines

Deck Plates—Manhole Covers

1. If you remove a deck plate or manhole cover anywhere on board ship, warn other personnel that it is off.

2. If you must leave the "opening" try to place a guard over it; perhaps a saw-horse or a step-stool, etc. If possible, rope off the area.

3. Never leave such covers off longer than necessary.

4. When lifting these covers take a good stance, a firm grip, and lift with your leg muscles, rather than with your back. Once it is off, be careful where you set it aside; don't make it a tripping hazard for another person.

5. If a deck plate or manhole cover is out of position at time of changing watch, be sure to warn the new watch.

6. If a deck plate or manhole cover is removed, it is often for some job being done under deck. In this situation a standby man must be positioned at the opening at all times; he will warn others of the danger and keep in contact with the man under deck for his safety. ⚓

Courtesy National Safety Council

Electrical Hazards Can Be Minimized With Care, Maintenance

The major hazards on shipboard from electricity come from improperly grounded electric tools. Any electric device, whether portable or stationary, which is not metallically bonded to the ship's structure may transmit a shock to a man who touches it. This risk becomes greater as more hand electric tools come into use, and as wiring deteriorates on older ships.

Many tools come equipped with three wire conductors, one of which is connected to the frame of the tool. When this third or ground wire is firmly attached to an unpainted portion of the ship, the shock hazard is removed.

On Mariner Class ships, electrical receptacles are built for three-pronged plugs. On many other present-day ships, the receptacles are only two-pronged. This requires an independent ground with a battery clamp at one end in order to complete the grounding. If the tool has a three-conductor the third or ground wire protrudes from the cord just before the cord enters the two-pronged plug. The battery clamp should be made fast to this wire.

If a three-conductor cord is not available on the tool, a single strand of #14 ga. copper wire should be connected to the frame of the tool, wound around or lashed to the cord, and fitted with a battery clamp at the other end.

In all cases where a three-pronged plug and receptacle are not in use, the ground wire should be clamped onto the grounding point of the ship before the tool is plugged in, and not removed until the plug has been pulled.

The ground wire must make a firm contact with steel that is in metallic contact with the ship. Merely wrapping a bare wire around a painted stanchion is of little value, since the resistance may be so high as to cause the current to take the alternative path through the man's body. The #14 ga. copper wire is recommended for the same reason—to present an easy or low resistance path to grounding.

Each tool or appliance should be checked as soon as it is brought aboard ship, after any repairs are made on it, and particularly after a fuse blows on a circuit where it is being used. Resistance between the frame and ground wire should be zero. Between the frame and each of the power conductors, the resistance should be well above 100,000 ohms. The cause of a lower reading should be determined, and repairs made before the tool is used again.

Water, oil, and dirt are the major causes of installation breakdowns in tools. Keep all tools dry and clean, and do not oil them excessively.

The cord or cable on electric tools should be of an approved type only. If damaged, it should be replaced—not spliced. Electric hand tools should never be suspended by cord. Cords or cables should not be allowed on floor plates where they might become damaged or offer a tripping hazard. The cords should be inspected regularly for damaged plugs, receptacles and cable connections.

The makeshift portable lamp, or trouble light, as it is often called, is another major source of shock injury. Such lamps usually are little more than metal-encased sockets to which metal guards are clamped or screwed. Moisture, very prevalent on ships, may reduce the insulating properties of the socket and permit the current to leak to the metal case.

The lamp cord is usually any piece of available two-conductor wire. It is invariably fabric covered, and prone to shredding. A heavy-duty rubber-coated cord is available. As safe as this might be, it's still a good idea to use a ground wire between the metal socket of the makeshift lamp and the ship's structure.

A far superior alternative would be the modern commercial portable lamp, which has the triple safety of a hard rubber covered socket and guard, a neoprene covered cord which is moisture and oil proof and vulcanized into the socket, and a third conductor to ground the lamp should the rubber coating peel.

Other shipboard shock hazards can be minimized by following common sense rules.

Before working on a radar antenna, disconnect main supply switch, turn the radar off, turn the scanner off, and leave a sign on the radar reading, "Do not turn on, man aloft." As a final precaution, remove the scanner fuse and fuse holder and keep them in your pocket.

Keep hands off all electrical circuits unless your duties require it.

Treat all circuits as though they were "hot" until you personally make sure they are dead.

When working on a circuit or motor, remove the fuse, or if possible, lock the switch open. Place a sign on the switch to warn others that you are working on the line.

Stand on a dry rubber mat on board when working on electrical equipment.

When removing fuses, use only approved-type fuse tongs. Be sure all fuses used are of the correct rating for their load. Never bridge a fuse.

When a victim suffers a severe, prolonged shock, most of the harm is done because rescuers are afraid to come near him. The following steps should be taken at once: the current should be cut, or if that cannot be done, the victim can be dragged from the raw wire by a broomstick, belt, coat or other non-conductor of electricity.

Everyone on shipboard should know how to remove a victim from a "hot" line in perfect safety, and how to administer mouth-to-mouth or mouth-to-nose artificial respiration. Closed chest cardiac massage can also be useful to know. In electric shock cases, massage and respiration may have to be administered for hours, by a relay of qualified persons.

Courtesy Safety Valve *of District 2 MEBA.*

AMENDMENTS TO REGULATIONS

Title 46—SHIPPING

Chapter I—Coast Guard, Department of Transportation

SUBCHAPTER T—SMALL PASSENGER VESSELS (UNDER 100 GROSS TONS)

[CGD 72–68R]

PART 177—CONSTRUCTION AND ARRANGEMENT

Fire Protection

The purpose of these amendments to small passenger vessels regulations is to achieve uniformity in approval of materials for fibrous glass reinforced plastic (FRP) construction. The Coast Guard has found that vessels of fibrous glass reinforced plastic that are constructed with resins that are not fire retardant (F/R) do not have sufficient protection against fires. The amendments in this document are made to minimize such hazards on small passenger-carrying vessels constructed of fibrous glass reinforced plastic.

These amendments were proposed in a notice of proposed rulemaking published in the February 24, 1971, issue of the Federal Register (36 F.R. 3425) and in the Merchant Marine Council Hearing agenda (CG–249) dated March 29, 1971. The proposed amendments in this document were identified as item PH 9–71. A public hearing was held on March 29, 1971, in Washington, D.C., on the amendments proposed in the notice. Interested persons were given the opportunity to submit comments both before and at the public hearing and to make oral comments concerning all the proposed amendments at the public hearing. Extension of time to submit written comments on the proposals was granted by a notice published in the April 10, 1971, issue of the Federal Register (36 F.R. 6902).

Eleven written comments were received on item PH 9–71. In general, the comments evidenced confusion regarding the implementation and application of the proposed amendment. In order to eliminate possible sources of confusion, the original proposal was withdrawn, and a new amendment was published in the April 6, 1972, issue of the Federal Register (37 F.R. 6947). Interested persons were requested to participate in this proposed rulemaking by submitting written comments by May 8, 1972.

The Coast Guard received 38 comments as a result of the April 6, 1972, notice of proposed rulemaking to require fire retardant resin in the construction of small commercial vessels as described by 46 CFR Subchapter T, Part 177 (CGD 72–68P, 37 F.R. 6947).

1. Seven vessel operators expressed a fear that the Coast Guard was putting them out of business. They are carrying six (6) passengers or less, therefore, 46 CFR Subchapter T does not apply.

2. Nine commenters agreed with the proposal. These were from: A retired CWO, U.S. Navy; a Boating Safety Advisory Council member; boat manufacturers; a naval architect-marine engineering firm; and resin manufacturers.

3. Twenty-two commenters opposed the proposal for one or more reasons. They were from: Resin manufacturers, boat manufacturers, lawyer representing industry association and fibrous glass producers. The Coast Guard found no justification in any of their statements for the reasons discussed below:

a. The rule will put party boat operators out of business. The rule does not affect boatowners whose boats are under 65 feet in length and are under 100 gross tons and are only carrying six passengers or less for hire. The present wording of the rule allows an owner or operator 6 months after publication of this rule to have his vessel certificated. Existing vessels that are certificated prior to this time may continue in service.

b. The use of F/R resins: Increases the overall cost of the boat; delays mold time; are harder to wet out; suffers a loss of physical properties; will limit construction systems; and increases the overall weight of the boat.

Fire retardant resins are more expensive than standard resins; however, the total cost of a boat would not increase over 1–2 percent due to the use of resins specified under MIL–R–21607. In our opinion, a 2 percent higher boat price is not unreasonable in order to gain a significant improvement in fire safety. These resins have all of the handling characteristics of general purpose resins such as cure time, glass wet out, viscosity, specific gravity, laminate strength and the same laminating techniques. With today's materials and know-how when using the various polyester catalysts and promoter systems that are available, mold time can be controlled. The fire retardant resin is a little heavier due to the fire retardant properties. The weight of the F/R

resin is approximately 1.25 pounds per cubic foot while the G/P resin is approximately 1.10 pounds per cubic foot. Since there is no need for additional glass, the weight increase is considered negligible.

c. There is a limited source of F/R resins and it is unfair to require 1 year outdoor weathering for these resins.

The chemical industry has more than enough production capacity to convert the boating industry to fire retardant resins in all of their large boats. There are five suppliers of 24 different accepted types of MIL–R–21607 F/R resins now on file. The test for fire retardancy after 1 year outdoor weathering is a necessity since it is known that some fire retardant additives leech out after weathering. The presently accepted resins have the fire retardant properties inherently bonded into the resin at the time of manufacture.

d. MIL–R–21607 does not represent the advance technology that is available today nor is it necessarily well suited for marine application.

MIL–R21607 is in need of a slight revision to include the outdoor weathering requirement contained in proposal CGD 72–68P. It is presently being revised by the U.S. Navy with the cooperation of industry. To say that F/R resins are not necessarily well suited for marine use is questionable since the U.S. Navy, U.S. Coast Guard, and two major boat manufacturers use F/R resins in the fabrication of their boats, also it is known that four or five other major pleasure boat manufacturers use F/R resins in the fabrication of their fuel tanks for safety reasons.

e. F/R resins will not prevent fires caused by gasoline engines, poor ventilation, improper wiring, or galley stoves. Prohibit the use of gasoline engines and require diesel engines.

No claim is made that F/R resins will stop fires from galley stoves, gasoline engines, poor ventilation, improper wiring; however, these are not the only sources of fires. Fire can also start with a child playing with matches, a cigarette, etc. Whatever the source, F/R resins will be slower to ignite, and in some cases will not ignite at all. All in all, its use will allow more time to extinguish the fire since it will be contained in one area by not spreading as a fire will using G/P resins. The use of diesel engines in lieu of gasoline engines is one step in the right direction for removing the source of fire.

f. Fire retardant resin doesn't offer much protection against fire for the cost. Burns like wood; why is wood accepted? Wood and aluminum burn and melt, are you going to require F/R wood and aluminum?

Fire retardant resins add a great measure of safety in the event of a fire regardless of its source for the small added cost involved which is approximately 1–2 percent for the overall cost of the finished boat. The fact that general purpose resin laminates burn two to four times as fast as ordinary wooden construction and are easier to ignite and are also subject to early structural collapse is sufficient reason to consider G/P resin systems dangerous. At the present time F/R FRP laminate construction is not included in Subchapter T regulations. The main purpose of this proposal is safety and to bring the FRP construction up to the level of wood used in a similar construction.

g. The handling of F/R resins makes people ill. Excess smoke and toxic products will be generated.

The Navy and the Coast Guard for their boats, and the Coast Guard Office of Merchant Marine Safety, for lifeboats have required the use of fire retardant resins for over 15 years. In handling resins, polyesters or epoxy, general purpose of fire retardant, there is always the possiblity that it may affect some people. Some people cannot handle the glass material without breaking out in a rash. The infection of dermatitis is more likely to be due to the unusual degree of exposure to solvents under extreme weather conditions. Skin tests done on rabbits showed no skin irritation, using seven types of polyester fire retardant resin. Products of combustion, chemical, and toxicological tests using rats indicated that the laminates being tested were no more toxic than those of plywood. Chemical analysis of the volatile products of combustion showed no hazardous accumulation of gases. (These reports are available.) Regardless of what the material is, anything that burns will emit toxic gas.

h. There should be other ways to achieve this fire retardant requirement other than the use of F/R resins: such as intumescent paints. The regulations should be on a performance basis to permit reduction of fire hazards by several means.

Other means of obtaining equal fire retardancy without using fire retardant resins will be given special consideration. The use of intumescent paint over FRP fuel tanks has been tried. There is no doubt that the use of intumescent paint retards fire for a short time. However, from the inquiries made to paint manufacturers this type of paint cannot stand weathering. The fire retardant properties leech out. This in essence means that it is no good on an open boat or in the bilges unless the bilges can be kept dry at all times or the boat can be kept out of the weather which in most cases is an impossible task.

i. Why not selective placement of retardant system? Selective placement could be possible if one could determine the source of fire and location. Selective placement would be of benefit, but could not insure the degree of protection desired.

j. The widespread and necessary use of other combustibles such as wood would support combustion. Why F/R resins for hull, why not a fire standard for all materials used?

It is agreed that the widespread use of combustibles for interior finishes and decor can surely add to the intensity of a fire and also to the rapidity which it spreads. The fact remains, however, that in cases where general purpose resins are used, they burn more fiercely and spread more rapidly than common wooden materials used in construction. The gen-

eral intent of this regulation is to minimize fire hazards insofar as reasonable and practicable.

k. A joint industry/Coast Guard committee should be established to study the issue. Through various meetings with industry the point in question, i.e., the use of fire retardant resins has been settled, therefore, it is not planned to establish another joint industry/Coast Guard study group on this issue.

l. We are concerned that we cannot meet OSHA (Occupational Safety and Health Act) Standards for our employees if this resin is used extensively in our plant. OSHA requirements allow 100 parts of styrene in the air per million parts. This condition could prevail regardless of the resins used, i.e., general purpose or fire retardant resins. Therefore, it is a question of proper ventilation.

One minor nonsubstantive change has been made to the original proposal which clarifies that an existing vessel must continue in service as a small passenger vessel carrying 150 passengers or less to remain certificated.

In consideration of the foregoing, Subchapter T of Title 46 of the Code of Federal Regulations is amended as follows:

1. By amending § 177.10–5 and adding paragraphs (a–1) and (a–2) to read as follows:

§ 177.10–5 Fire protection.

* * * * *

(a–1) Except for a vessel complying with the requirements contained in paragraph (a–2) of this section, each hull, structural bulkhead, deck, or deckhouse made of fibrous glass reinforced plastic on each vessel that carries 150 passengers or less must be constructed with fire retardant resins, laminates of which have been demonstrated to meet military specification MIL–R–21607 after a 1-year exposure to weather. Military specification MIL–R–21607 may be obtained from the Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, PA 19120.

(a–2) Each hull, structural bulkhead, deck, or deckhouse, made of fibrous reinforced plastic on a vessel that carries 150 passengers or less, that was certificated on July 11, 1973, and remains certificated may continue in service. Any repairs must be as follows:

(1) Minor repairs and alterations must be made to the same standard as the original construction or a higher standard; and

(2) Major alterations and conversions must comply with the requirements of this subpart.

* * * * *

(R.S. 4405, as amended (46 U.S.C. 375), sec. 3, 70 Stat. 152 (46 U.S.C. 390b), R.S. 4462, as amended (46 U.S.C. 416), sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1); 49 CFR 1.46(b))

Effective date. These amendments shall become effective on January 11, 1973.

Dated: December 1, 1972.

C. R. BENDER,
Admiral, U.S. Coast Guard,
Commandant.

[FR Doc.72–2110 Filed 12–7–72;8:52 am]
(FEDERAL REGISTER of December 8, 1972.)

AFFIDAVITS

The following affidavits have recently been accepted:

*U. S. Bellows Corporation**, Post Office Box D, 9484 Mission Park Place, Santee, Calif. 92071, FITTINGS. *Bellows expansion joints, 15 p.s.i. maximum.

Mid-Atlantic Flange Co., Inc., 140 Adams Street, Royersford, PA. 19468, FLANGES.

Tylok International, Inc., 25700 Lakeland Blvd., Euclid, Ohio 44132, FITTINGS.

Kemper Valve & Fittings Corp., Post Office Box 0, Wauconda, Ill. 60084, FITTINGS.

American-Darling Valve & Mfg., Division of American Cast Iron Pipe Co., Post Office Box 2727, Birmingham, Ala. 35202, VALVES.

Seco Mfg., Inc., West Linfoot Street, Post Office Box 378, Wauseon, Ohio 43567, VALVES.

Chicago Fittings Corp., 18th Avenue & 21st Street, Broadview, Ill. 60153, FITTINGS.

The following affidavited company has a new address as follows:

C. A. Norgren Co., 5400 South Delaware Street, Littleton, Colo. 80120.

ACCEPTABLE HYDRAULIC COMPONENTS

Manufacturer	Valve type	Identity	Maximum allowable working pressure
DeLaval, Barksdale Control Division, 5125 Alcoa Avenue, Los Angeles, Calif. 90058.	4-way(Al)	8141R1H*3-N	2,000
Do	4-way(Al)	8142R1H*3-N	2,000
Do	4-way(Al)	8143R1H*3-N	2,000
Do	4-way(Al)	8144R1H*3-N	2,000
Do	4-way(Al)	8162M1H*3-N	2,000
Do	4-way(Al)	8164M1H*3-N	2,000
Do	4-way(Al)	8181S1H*3-N	2,000
Do	4-way(Al)	8182S1H*3-N	2,000
Do	4way(Al)	8183S1H*3-N	2,000
Do	4-way(Al)	8184S1H*3-N	2,000
Parker-Hannifin Corp., Mantrol Division, 200 Perry Court, Elyria, Ohio 44035.	¾" 4-way	Series 101–C	3,000
Do	½" 4-way	Series 102–A	3,000
Parker-Hannifin Corp., Mobile Power and Control Division, 17325 Euclid Avenue, Cleveland, Ohio 44112.	Control valve	VDP 12D 10	2,000
Do	Control valve	VDP 12DD 10	2,000
Webster Electric Co., Inc., 1900 Clark Street, Racine, Wis. 53403.	Control valve	***AV2***	1,800

The following address change has been made to the Acceptable Hydraulic Component list:

Rivett Division, Applied Power Industries, Inc., 770 Capital Drive, Pewaukee, Wis. 53072.

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 applicable Federal Registers. (Official changes to all Federal rules and regulations are published in the Federal Register, printed daily except Saturday, Sunday, and 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 will be furnished by mail to subscribers, free of postage, for $2.50 per month or $25 per year, payable in advance. The charge for individual copies is 20 cents for each issue, or 20 cents for each group of pages as actually bound. Remit check or money order, made payable to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Regulations for Dangerous Cargoes, 46 CFR 146 and 147 (Subchapter N), dated October 1, 1972 are now available from the Superintendent of Documents price: $3.75.

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 (4–1–72). F.R. 7–21–72.
115	Marine Engineering Regulations (7–1–70) FR. 12–30–70, 3–25–72, 7–18–72.
123	Rules and Regulations for Tank Vessels (5–1–69) F.R. 10–29–69, 2–25–70, 6–17–70, 10–31–70, 12–30–70, 3–8–72, 3–9–72, 6–14–72, 7–18–72, 10–4–72, 10–14–72, 12–21–72.
129	Proceedings of the Marine Safety Council (Monthly).
169	Rules of the Road—International—Inland (8–1–72). F.R. 9–12–72.
172	Rules of the Road—Great Lakes (7–1–72). F.R. 10–6–72, 11–4–72.
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 (2–1–71) F.R. 10–1–71.
182	Specimen Examinations for Merchant Marine Engineer Licenses (7–1–63).
184	Rules of the Road—Western Rivers (8–1–72). F.R. 9–12–72.
190	Equipment Lists (8–1–72). F.R. 8–9–72, 8–11–72, 8–31–72, 9–14–72, 10–19–72, 11–8–72, 12–5–72.
191	Rules and Regulations for Licensing and Certification of Merchant Marine Personnel (6–1–72). F.R. 12–21–72.
200	Marine Investigation Regulations and Suspension and Revocation Proceedings (5–1–67). F.R. 3–30–68, 4–30–70, 10–20–70, 7–18–72.
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 (3–1–72). F.R. 11–3–72.
249	Marine Safety Council Public Hearing Agenda (Annually).
256	Rules and Regulations for Passenger Vessels (5–1–69). F.R. 10–29–69, 2–25–70, 4–30–70, 6–17–70, 10–31–70, 12–30–70, 3–9–72, 7–18–72, 10–4–72, 10–14–72, 12–21–72.
257	Rules and Regulations for Cargo and Miscellaneous Vessels (8–1–69). F.R. 10–29–69, 2–25–70, 4–22–70, 4–30–70, 6–17–70, 10–31–70, 12–30–70, 9–30–71, 3–9–72, 7–18–72, 10–4–72, 10–14–72, 12–21–72.
258	Rules and Regulations for Uninspected Vessels (5–1–70).
259	Electrical Engineering Regulations (6–1–71). F.R. 3–8–72, 3–9–72, 8–16–72.
266	Rules and Regulations for Bulk Grain Cargoes (5–1–68). F.R. 12–4–69.
268	Rules and Regulations for Manning of Vessels (10–1–71). F.R. 1–13–72.
293	Miscellaneous Electrical Equipment List (9–3–68).
320	Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf (7–1–72). F.R. 7–8–72.
323	Rules and Regulations for Small Passenger Vessels (Under 100 Gross Tons) (12–1–71). F.R. 3–8–72, 3–25–72, 6–24–72, 7–18–72, 12–8–72, 12–21–72.
329	Fire Fighting Manual for Tank Vessels (7–1–68).
439	Bridge-to-Bridge Radio Telephone Communication (12–1–72).

CHANGES PUBLISHED DURING DECEMBER 1972

The following have been modified by Federal Registers:

CG–190, Federal Register of December 5, 1972.

CG–123, CG–191, CG–256, CG–257, Federal Register of December 21, 1972.

CG–323, Federal Registers of December 8 and 21, 1972.