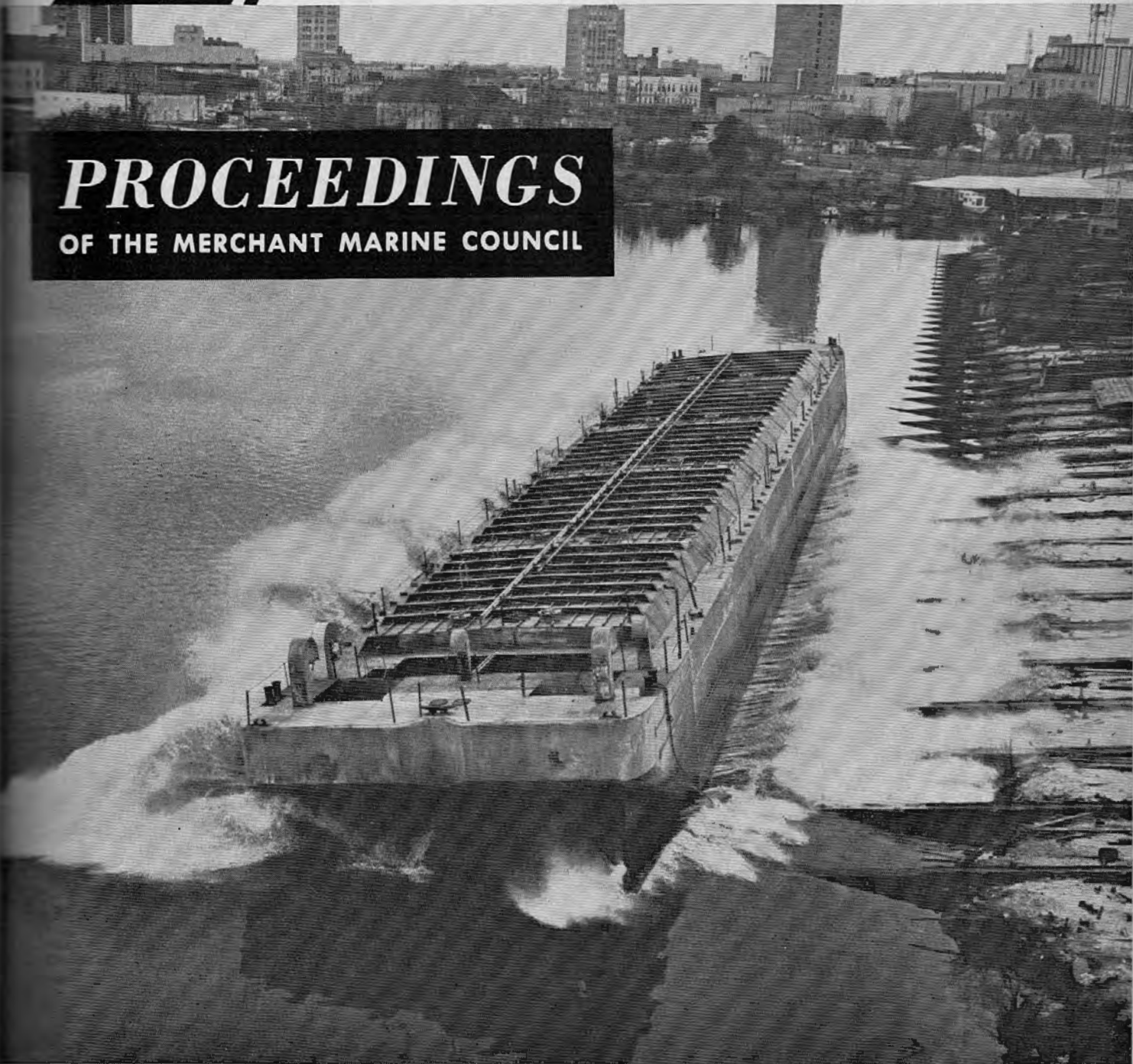




COAST GUARD

PROCEEDINGS OF THE MERCHANT MARINE COUNCIL



New Bulk Dangerous Cargo Regulations . . .

M/V *Southern Cities* Disappearance . . .

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COVERS

FRONT COVER: Launching of the chemical barge *Artemis* in March, one of the newest barges presently in service. She is designed to transport products requiring maximum purity control. *Courtesy Moran Towing and Transportation Co.*

BACK COVER: The towboat *National Gateway* pushes a big load of anhydrous ammonia on the Mississippi River. The tow consists of 8 barges carrying 20,100 tons of cargo. Length of the tow is 1,312 feet, width 100 feet, with a draft of 8'6". *Courtesy National Marine Service Inc.*

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PROCEEDINGS

OF THE MERCHANT MARINE COUNCIL

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August 1968

NEW BULK DANGEROUS CARGO REGULATIONS

Capt. E. G. Grundy, U.S.C.G., and Mr. W. E. McConnaughey

SAFETY IS A complex subject, and its achievement is greatly dependent on cooperation and mutual understanding of objectives by all concerned. Essential to understanding is an exchange of information and opinions. With this in mind, we wish to discuss some of the Coast Guard's current activities and ideas in the field of marine dangerous cargo safety.

It seems appropriate to begin by briefly reviewing the Coast Guard's responsibilities with respect to dangerous cargo transportation by water. These responsibilities are as follows:

1. Primary agency responsible for safety of life and property on navigable waters of U.S.
2. Administers Dangerous Cargo Act which regulates all hazardous commodities other than bulk flammable liquids.
3. Administers Tanker Act which regulates bulk flammable and combustible liquids.
4. Administers Espionage Act providing for port protection and security.
5. Administers and/or enforces several Acts and International Treaties relating to pollution (primarily oil) of U.S. and international waters.

As you can see, we have both general and specific responsibilities assigned to us. As the primary agency responsible for the safety of life and property on navigable waters of the U.S., we enforce not only our own regulations but all Federal laws in effect on the high seas, coastal waters,

From an address before the convention of the Greater New York Safety Council on February 27, 1968.

and inland waters. This leads to a broad and continuing concern with all aspects of safety on and around water. However, in the area of dangerous cargo transportation, we have additional specific statutory responsibilities assigned.

COAST GUARD STATUTORY RESPONSIBILITIES

I. *Dangerous Cargo Act*—The Dangerous Cargo Act (R.S. 4472) calls for the regulation of all dangerous cargoes other than bulk flammable liquids with the proviso, however, that Department of Transportation (DOT) classifications, containers, marking, labeling, etc., be used whenever they are adaptable to marine transportation. This is obviously desirable for the shipment of materials which may travel by several modes of transportation such as rail, truck, and ship, and it is normal practice for the Coast Guard to adopt DOT's procedures for packaged materials with additional requirements for stowage.

One thing that is not always appreciated about the Dangerous Cargo Act is that it is not confined to packaged commodities but also includes bulk shipments. It is the basis for Coast Guard regulations governing bulk transportation of nonflammable hazardous cargoes, such as anhydrous ammonia, sulfuric acid,

hydrochloric acid, molten phosphorous, chlorine, caustic soda, etc.

II. *Tanker Act*—The Tanker Act (R.S. 4417a) assigns responsibility to the Coast Guard for regulating the bulk transportation of flammable and combustible liquids. In contrast to the Dangerous Cargo Act, this Act makes no reference to DOT classifications, and commodities are classified in the implementing regulations primarily on the basis of flashpoint and Reid vapor pressure. This is a very logical and effective procedure for petroleum and petroleum distillates which have "conventional" fire and explosion as the primary hazards. However, as will be pointed out later, difficulties arise with bulk cargoes which have unconventional fire hazards or other hazardous properties in addition to flammability.

III. *Port Security*—Responsibilities for port security are assigned to the Coast Guard by the so-called Magnuson Espionage Act and Executive Order 10173 as amended. This Act includes the safety regulation of waterfront industrial and marine activities of any type which may jeopardize the normal functioning of a U.S. port. As a result, implementing regulations have been developed for the handling of dangerous cargoes on waterfront facilities and on board vessels and for vessel movements as necessary to assure the safety of ports, vessels, and waterfront facilities.

IV. *Water Pollution*—Another area of responsibility for the Coast Guard is the prevention of water pollution. To date, this has consisted primarily of enforcement activities relating to

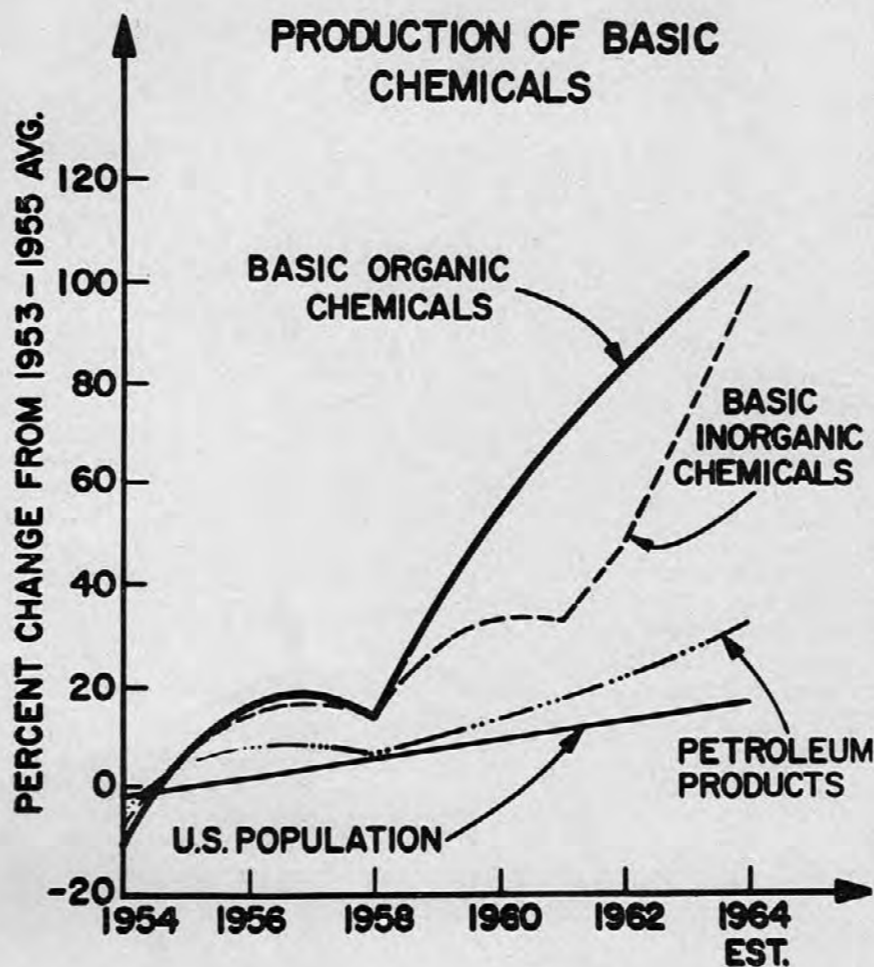


Figure 1.

oil pollution by ships and boats in the navigable waters of the United States and the offshore prohibited zones. However, there is a great national concern over all types of water pollution. As a result of this concern—and in spite of present uncertainty about the scope of our future role in this area—we are recognizing the hazard of pollution in the development of new vessel regulations and import safety contingency planning. Until directed otherwise, we view pollution control as a logical corollary to our other duties relating to dangerous cargo safety.

FOREIGN VESSELS HANDLING DANGEROUS CARGOES IN U.S. PORTS

So far as U.S. flag vessels carrying dangerous cargo are concerned, the Coast Guard carries out plan approvals and periodic inspections, establishes manning requirements, licenses merchant marine personnel, prescribes special operating requirements and cargo stowage, etc. In the case of most foreign flag vessels, we accept international certificates whenever they are available and formally agreed to. However, for vessels of unusual design or those carrying unusually

hazardous cargoes which might jeopardize U.S. lives and property, we require approval of cargo containment and handling plans prior to entry into a U.S. port. On its initial visit, an inspection of the vessel is made to assure conformity to plans and adequacy of the cargo handling and fire protection systems. The standards in this case are the same as for U.S. flag ships, with the main overall difference being that we do not have statutory responsibility for the comfort and safety of the foreign personnel aboard or for the ship's structure while operating on the high seas. Some of the types of cargo presently considered to be unusually hazardous are cryogenic materials such as liquid methane, compressed gases such as LPG and ammonia, highly toxic materials such as acetone cyanohydrin, and extremely reactive materials such as ethylene oxide. Details of this policy are given in a Navigation and Vessel Inspection Circular.¹

REGULATORY PHILOSOPHY

Basically, there are two approaches to safety—"correction" and "anticipation". For a regulatory agency, by far the technically simplest is correction, in which problems define themselves in terms of casualties and actions are based entirely on accident history. The more difficult approach is to anticipate hazards and prevent or minimize them on the basis of advance knowledge. Probably the most common question is, "Why are you concerned? There haven't been any casualties—at least, any serious ones—have there?" The answer is that we feel we are dealing with potential casualties whose severity

¹ "Foreign Vessels Carrying Bulk Liquid Cargoes Which Involve Potential Unusual Operating Risks; Requirements for Plan Review and Inspection", Navigation and Vessel Inspection Circular No. 13-65, Commandant U.S. Coast Guard (MHM), Washington, D.C.

can be so great that we can't afford the luxury of developing accident statistics. For instance, we feel it is impractical to attempt to learn the maritime transportation hazards of ethylene oxide from tanker explosions or of chlorine from barge casualties which may annihilate a town, or of ammonia, phenol and tetraethyl lead from catastrophic releases which may contaminate city water systems or cause major fish kills. Furthermore, because of the dynamic nature of the chemical industry and the ever-shortening time from test tube to bulk shipment, there is little opportunity to acquire statistically significant experience. To anticipate a question at this point, marine dangerous cargo transportation has a *good* safety record. However, this record is largely based on the transportation of conventional petroleum cargoes and very careful regulation. Frankly, we're afraid to run an experiment to determine the effect of having no regulations or of using present conventional cargo regulations for unconventional materials.

The net result of this line of thought is that the Coast Guard approaches its regulatory duties in the area of dangerous cargoes on the basis of "anticipation" rather than "correction", although, of course, the experience aspect is not ignored. We attempt to identify problems and anticipate hazards under conditions of changing cargo types and shipping technology. This obviously is a difficult job for the limited number of Coast Guard personnel available. However, we make no attempt to "go it alone" and we draw on many sources of information. Part of our regulatory philosophy is that the Coast Guard should be in a position somewhat analogous to the hub of a wheel with information pipelines extending in many directions, similar to spokes. Information, advice, and assistance should flow in to the Commandant whose staff directs and digests this flow into regulations properly reflecting economic and scientific aspects and overall Federal

government policies. It is obviously impossible to have a staff expert in all facets of a subject as complex as dangerous cargo transportation. However, it is quite practical to develop an organization which can effectively utilize outside help.

CHANGING CONDITIONS AFFECTING WATER TRANSPORTATION

As you know, regulation of marine transportation is not new although the Coast Guard did not assume its responsibilities until 1942 when they

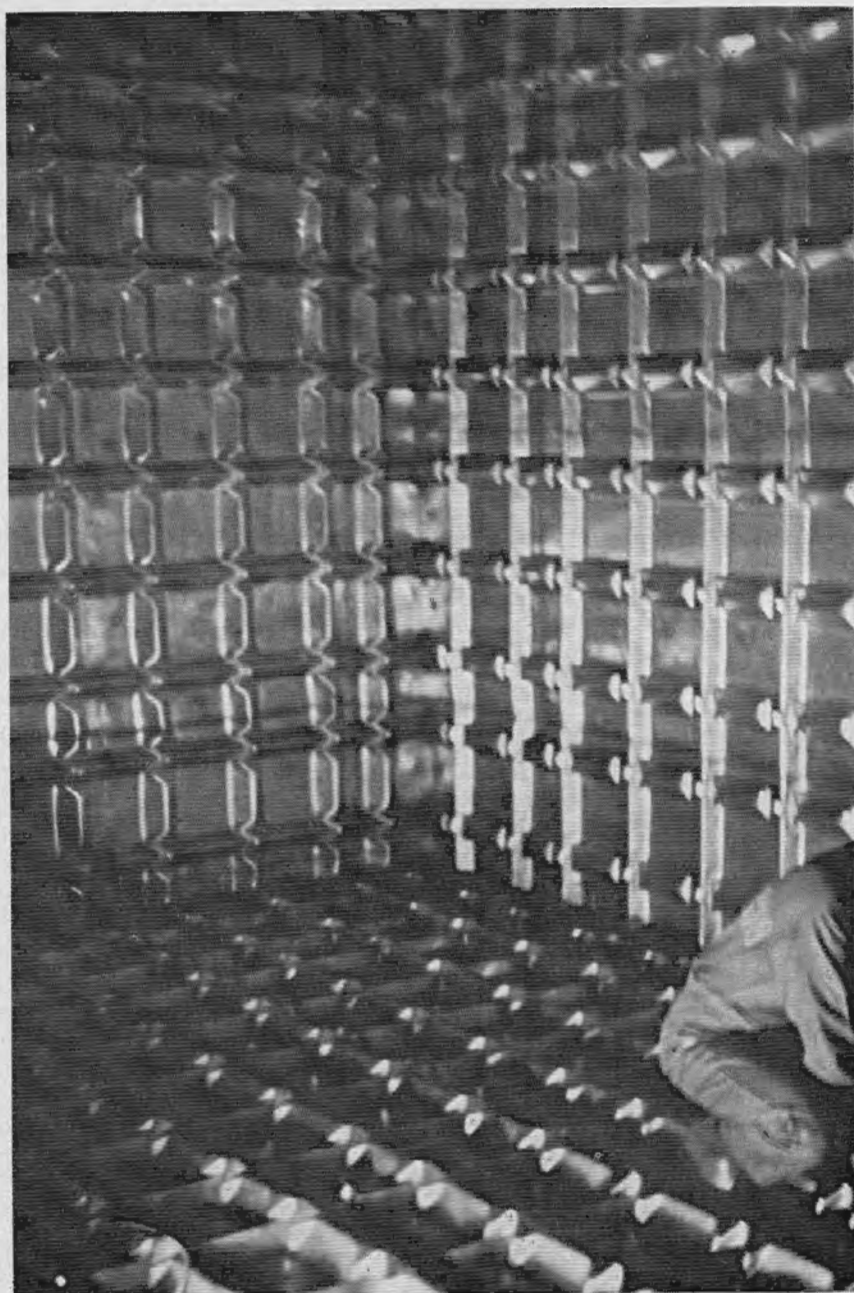


Figure 2. Membrane Tanks in Liquid Ethylene Tanker.



Figure 3. Ethylene Oxide Tanker.

were transferred from the former Bureau of Marine Inspection and Navigation. Therefore, you might ask, "Why is there a current problem? Why hasn't everything been worked out already?" The answer is that conditions are changing and standards are changing. The biggest factor in changing conditions is the phenomenal growth of the chemical industry. Figure 1 shows this growth quite dramatically.² This figure plots percent growth as a function of time from 1954 to 1964. You will notice that the so-called "population explosion" is far overshadowed in this period by the growth in chemical production and that the contrast is steadily becoming greater. While this plot is now nearly four years old, the trends certainly have not changed. This is shown by some recent statistics on oceangoing chemical tankers.³ In 1958, there were 4 chemical tanker owners with a total of 9 ships having a combined capacity of 43,000 tons.

² "Ten Year Growth Patterns in the Chemical Processing Industries", Putnam Publishing Company (1965).

In 1968 this has grown to 7 chemical tanker owners with a total of 58 ships having a combined capacity of 700,000 tons. Liquefied gases have shown an even more dramatic growth—from 1 LPG ship holding 6,000 cubic meters to 216 ships holding more than a million cubic meters in the same ten-year period.

Another element of changing conditions is the rapid advance in cargo carrying technology in the last few years. This is illustrated by Figure 2 which shows tanks only $\frac{1}{25}$ of an inch thick on a vessel which carries refrigerated ethylene at -155° F. It is also illustrated by Figure 3, showing a tanker carrying extremely hazardous ethylene oxide—a material which has demonstrated its disaster potential by completely destroying a chemical plant with only 6,500 gallons in a storage tank. The technology which permits these types of

³ "Chemical Ocean-Going Tankers: A Sixteen-Fold Tonnage Growth Within Period of Last Ten Years", Oil, Paint and Drug Reporter, Vol. 193, No. 7, 12 February 1968.

cargoes to be moved by water is very new and is in stark contrast with that required for conventional petroleum product shipments by water.

Yet another element of changing conditions is the rapid growth in population. This has a number of effects on water transportation safety such as greatly increased exposure of the public to marine dangerous cargo hazards. It is no longer possible to rely on isolation to protect the public from major casualties, especially those which may release large amounts of toxic materials. Figure 4 shows the area jeopardized by one chlorine barge if its cargo were suddenly released. Picture the consequences in port areas like New Orleans or Houston! Another effect of population growth is the rapidly increasing congestion on the waterways and in ports, with greatly increased collision probabilities. Yet another effect is the development of new types of public concern—notably air and water pollution. Figure 5 shows the water quality monitoring network along just one section of one of our inland waterways (between Paducah

and Pittsburgh on the Ohio River).⁴ There are more than 40 stations here monitoring the chemical and biological quality of the water and evaluating the results in terms of drinking water standards and the well-being of aquatic life. This goes well beyond the historical concern with oil pollution alone and indicates that water pollution must be seriously considered in dangerous cargo safety. And there is similar concern with air pollution which may come from marine activities such as cargo venting, gas-freeing, etc.

THE NEED FOR NEW REGULATIONS

From our observations so far, regarding the Coast Guard's assigned responsibilities and the rapidly changing conditions affecting marine dangerous cargo transportation, it is evident that our regulations must be dynamic and attuned to the needs of the times. We rather immodestly feel that the Coast Guard has led the world in maritime safety and dangerous cargo regulations with the happy result that the U.S. maritime safety record is excellent. Let me hasten to add that this has been possible only because of the warm cooperation of industry. However, in these fast changing times, none of us can rest on his laurels and we must run fast just to stay where we are in achieving safety—let alone make desirable progress. Regulations are by no means the only method of saving lives and property—other methods such as training and education at all levels, development of new knowledge and understanding of hazards, stimulation of interest in safety, are equally important. The Coast Guard is active along all of these lines.

Several years ago a Coast Guard Special Task Group reviewed our present regulations for bulk transportation of dangerous cargoes to identify specific problems and recommend suitable corrective measures.

⁴ "Nineteenth Yearbook (1967) of the Ohio River Valley Water Sanitation Commission".

The general conclusions of this group were:

(1) that existing regulations are not adequate for the new types of cargoes which are being proposed in rapidly increasing numbers and

(2) that "patching them up" was not the answer—a new approach was necessary.

On the basis of this task group's work and related studies by Headquarters technical staff personnel, a new concept for bulk dangerous cargo regulation was developed which included the following features:

(1) A new subchapter would be developed to provide for all commodities having hazards other than or in addition to conventional flammability (e.g. toxic, reactive, unstable, etc.). This would incorporate appropriate parts of Subchapters D (Tank Vessel Regulations), I (Cargo Vessels Regulations) and N (Dangerous Cargo Regulations) but these subchapters would remain largely unaltered except for the deletions.

(2) All bulk cargoes approved for water transportation would be identified by name, and classifications would not be referred to in the new Subchapter. A hazard evaluation system would be developed to provide a consistent and comprehensive basis for establishing structural and operating requirements for individual commodities. This system would be developed by the National Academy of Sciences' advisory committee to the Coast Guard on hazardous materials and would be used as a guide in development of regulations but would not become part of the regulations.

(3) The new subchapter would include solid, liquid and gas cargoes in barges, ships and portable tanks. However, initial efforts would be devoted to liquids and liquefied gases in unmanned barges.

(4) Only cargo carrying requirements would be included in the new subchapter. General vessel construction and operation requirements (e.g.,

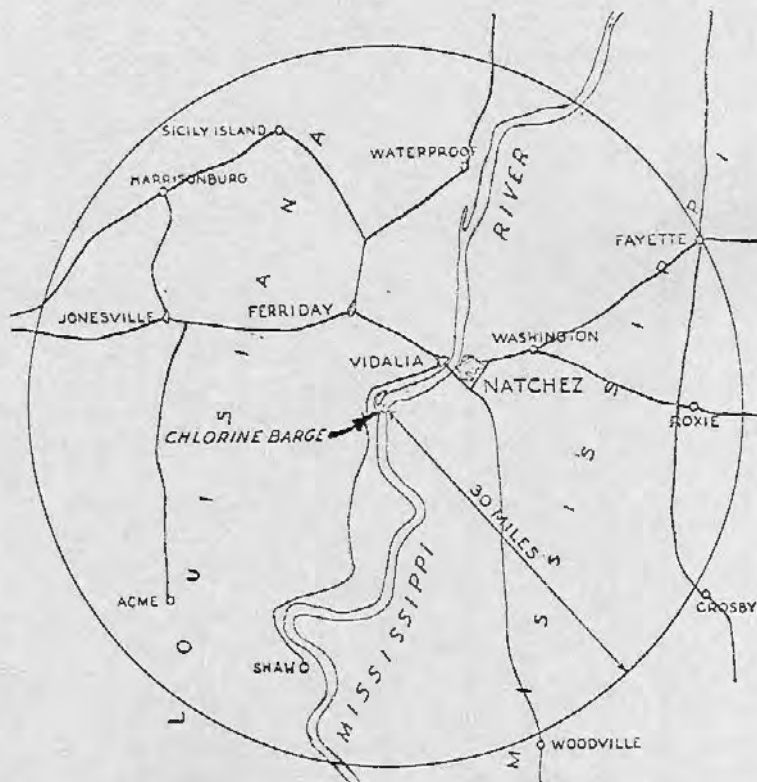


Figure 4. Potential Danger Zone from Chlorine on Sunken Barge.

lifesaving equipment, propulsion, manning, etc.) would not be repeated and vessel certification would be as tank vessels or cargo vessels through Subchapters D or I.

PROPOSED NEW REGULATIONS

To implement these concepts and draft proposed regulations, a joint Coast Guard-industry task group was

established in 1965 under the Merchant Marine Council's Chemical Transportation Advisory Panel. Because of the complexity of the task, progress has been slow but now, after seventeen meetings totalling 45 days plus much "homework" a draft has been submitted to the Coast Guard by the Chemical Transportation Advisory Panel. Present plans call for holding a public hearing early next

year in conformity with regular Coast Guard procedures. However, much groundwork has been laid by means of what might be called an "industry hearing" in which four major trade associations, Manufacturing Chemists' Association, American Petroleum Institute, Chlorine Institute, and Compressed Gas Association have made detailed reviews of a draft. As a result of their valuable comments and recommendations, the final proposed regulations are not expected to create controversy at the public hearing. It is planned for the task group to proceed in the near future to the development of similar regulations for ships. Some changes in task group membership are expected, to provide a deep draft vessel orientation, but progress should be much faster since many of the principles will be the same.

So much for the generalities. What are these new regulations and how will they affect industry? The heart of the regulations is a chart of minimum requirements, representative parts of which are shown in Figure 6. As you can see, a building block approach has been used in which cargo carrying aspects of a barge have been divided into elements. These elements are shown as column headings across the top of the chart. Terms used for each element are shown at the bottom of the columns (these will not appear in this manner in the actual chart). For each element, there is corresponding text which provides details. This format was developed and adopted for several reasons. First, it is believed to be the best way to conveniently answer two kinds of questions:

(1) what are the requirements for a specific cargo?

(2) what cargoes can be carried by a specific barge? The second reason is that it minimizes the amount of repetition in the text. Independent treatment of each cargo, as is now done in parts 40 and 98, would greatly increase the mass of regulations and would increase the probability of inconsistencies.

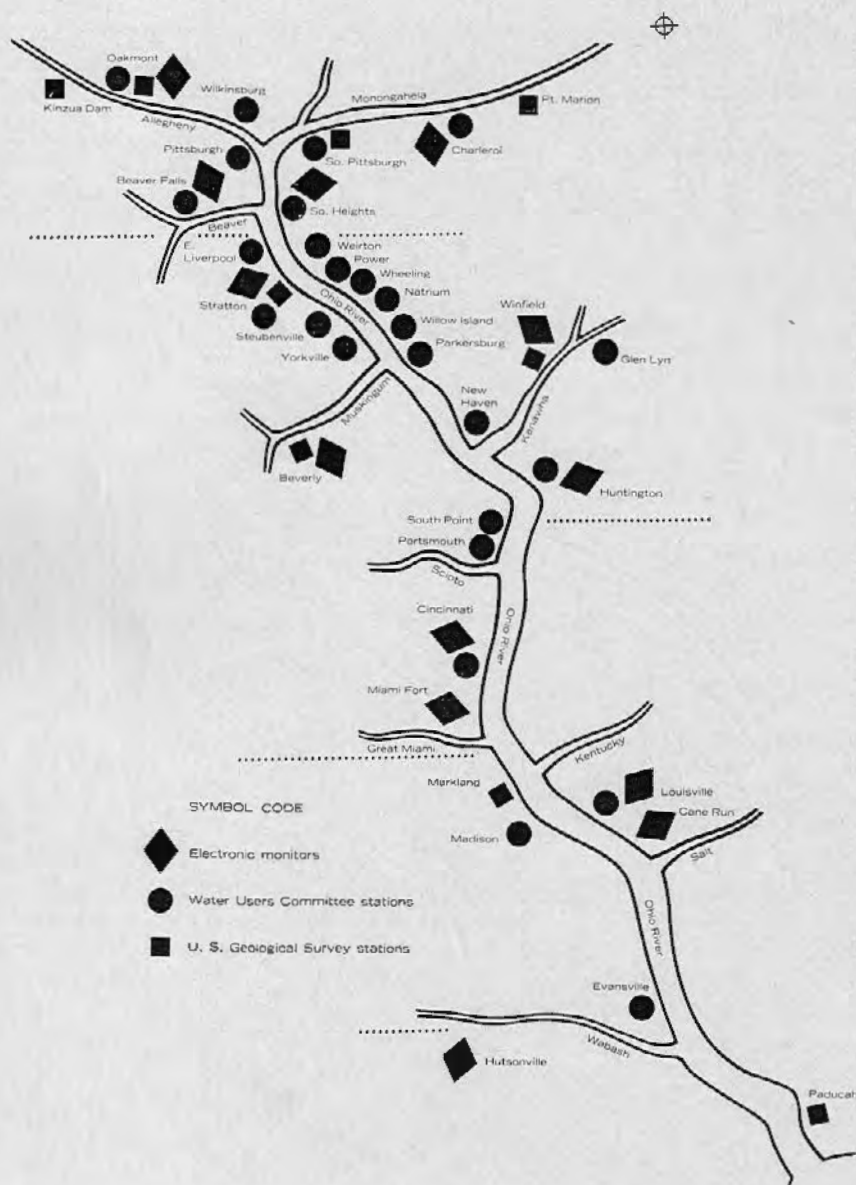


Figure 5. Ohio River Valley Water Sanitation Commission (ORSANCO) network of monitor stations on the Ohio River and some major tributaries provides means for continuous checking of water-quality conditions.

SUBCHAPTER 0 FOR BARGES

Cargo identification			Hull type	Cargo segregation		Type	Tank		Special requirement
Chemical name	Pressure	Temperature		Tank	Piping venting		Vent	Gaging device	
Acrylonitrile	Atmospheric	Ambient	II	1. ii 2. i* 3. ii	B	Integral gravity.	Pressure vacuum.	Closed	151. 55-8
Ammonia (anhydrous).	Pressurized	Ambient	II	1. N.A. 2. i* 3. ii	B	Independent pressure.	Safety relief, 250 psi.	Restricted	151. 50-30 151. 50-32
Ammonia (anhydrous).	Atmospheric	Low	II	1. N.A. 2. i* 3. ii	B	Independent gravity.	Pressure-vacuum.	Restricted	151. 50-30 151. 50-32
Caustic soda solution.	Atmospheric	Ambient elevated.	III	1. i 2. ii 3. i	A	Integral gravity.	Open	Open	No
Ethylene oxide	Pressurized	Ambient	I	1. N.A. 2. i* 3. ii	A	Independent pressure.	Safety relief	Restricted	151. 50-10 151. 50-12
Sulphur, Liquid	Atmospheric	Elevated	III	1. i 2. i* 3. ii	B	Integral gravity.	Open	Open	151. 50-55
Chemical name	Pressurized	Ambient	I	From water	A	Gravity	Open	Open	Special materials.
	Atmospheric	Low	II	From cargo	B	Pressure	Pressure-vacuum.	Restricted	Protective equipment.
		Elevated	III	From spaces	C	Integral Independent	Safety relief	Closed Isolated indirect.	Compatibility. Etc.

Figure 6. Abbreviated chart.

Probably the best way to explain this chart (and hence the regulations) is to discuss each element—not only those shown in this abbreviated version but also the others which have been left off for clarity.

(1) *Cargo Identification.* This element identifies each cargo by common chemical name and the general pressure and temperature conditions during transport. This is particularly necessary when a product can be shipped utilizing a number of transportation techniques. For example, anhydrous ammonia may be shipped in a pressurized state at ambient temperatures; in a nonpressurized state at low temperatures (at its boiling point), and in a semipressurized state at a reduced temperature. The method of containment varies with the transport conditions and proper identification allows this change in containment standards to be recognized.

(2) *Hull Type.* This element

deals with the stability and collision protection required for a barge. The requirements vary with the nature of the product, allowing adequate measures to be taken to prevent uncontrolled release of a cargo due to a barge's grounding or collision.

(3) *Cargo Segregation/Tank.* This element prescribes any necessary structural requirements to isolate the cargo from other cargoes, from the waterway, and from machinery spaces on the basis of reactivity and flammability hazards.

(4) *Cargo Segregation/Piping, Venting.* This element indicates the required separation of piping and venting used for the cargo from piping and venting for other cargoes.

(5) *Tank/Type.* This element describes tank design criteria and the method in which tanks are placed inside the hull of the vessel. Graduated containment standards are used so that the hazards of a particular product are properly controlled.

(6) *Tank/Vent.* This element refers to arrangements for preventing excess pressure or vacuum within the cargo tank and the release of hazardous vapors under normal conditions.

(7) *Tank/Gaging Device.* This element is concerned with control of hazardous cargo vapors and padding and inerting gases in connection with determining the amount of cargo in the tank.

(8) *Cargo Transfer.* This dual element prescribes piping quality and valving for the cargo piping system based on the nature and degree of hazard of the cargo.

(9) *Environmental Control/Cargo Tank.* This element refers to control of the composition of the environment within cargo tanks to control flammability and instability hazards.

(10) *Environmental Control/Cargo Handling Space.* This element refers to control of the atmosphere in



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Captain Grundy's marine inspection service began in 1943 at Portland, Oregon as a Hull Inspector. In 1949 he was assigned to Headquarters in Merchant Vessel Inspection Division and Port Security and Law Enforcement Division. In 1957 he was assigned to the Marine Inspection Office in St. Louis as Senior Inspector of Personnel and Senior Inspector of Materiel, and in 1958 he was a hull inspector in the Marine Inspection Office, New York. He returned to Headquarters in 1962 as Chief, Chemical Engineering Branch. In 1966 he was Commanding Officer of the CGC Cook Inlet where he served until his present position.

cargo handling spaces to control toxicity and flammability hazards.

(11) *Fire Protection Required.* This element specifies whether the cargo is considered to have a fire hazard and, hence, whether protection facilities are required. Extinguishing agents must be suitable for the particular cargo.

(12) *Special Requirements.* General standards recognize only certain aspects of a product. It may be necessary, in order to completely define containment standards for a particular product, to prescribe

special requirements based upon the product's individual peculiarities. This column references applicable sections of the text.

(13) *Electrical Installation.* This element identifies the acceptable electrical installation for the vessel. Should explosion-proof devices be required, the correct class and group rating is stated.

(14) *Temperature Control Installation.* This element describes standards for maintaining control of the state of the cargo, if necessary for safety reasons.

(15) *Tank Internal Inspection Period (Years).* An important aspect of cargo containment safety is periodic inspection of equipment. This column prescribes the maximum permissible period of time between internal examinations of the tank.

We believe that when all of these elements are put together, they effectively describe the cargo safety aspects of an unmanned barge carrying dangerous liquids and liquefied gases in bulk. Two other features of the new regulations that do not appear on the chart are worthy of note. One of these deals with the question of knowing which cargoes are regulated by the new subchapter and which will continue to be regulated by Subchapter D on the basis of having only conventional fire hazards. The solution to this problem is to include two lists of cargoes—one prescribing cargoes regulated under the new subchapter and one prescribing those regulated under Subchapter D. Cargoes not appearing on either list cannot be shipped in bulk until a determination has been made by the Coast Guard. No rigid rules are applied but, as in developing requirements in the chart, the hazard evaluation system developed for the Coast Guard by the National Academy of Sciences⁵ is used as a guide.

⁵ "Evaluation of the Hazard of Bulk Water Transportation of Industrial Chemicals", NAS Publication 1465, National Academy of Sciences, Washington, D.C.



William E. McConnaughey, the technical advisor in the Hazardous Materials Division, U.S. Coast Guard Headquarters, is a chemical engineering graduate of the University of Nebraska. Following a period of active duty as a Naval Reserve Officer during World War II, he joined the staff of the Naval Research Laboratory where he carried out research and development in the areas of aluminum anodization cathodic protection, underwater jet propulsion, and submarine atmosphere control. Subsequently he was a R&D group leader with the Electric Boat Division of General Dynamics, a staff assistant in the Bureau of Ships, and head of the Chemistry Division at the Navy Marine Engineering Laboratory. He is a registered professional engineer in the District of Columbia, a member of the American Institute of Chemical Engineers, the American Chemical Society, American Conference of Governmental Industrial Hygienists, and is a Captain in the Naval Reserve.

The other feature of note in the new regulations is the general requirement that information on cargo identity, properties and hazards must be provided for transportation, and personnel in charge of cargo transfer operations must be specially qualified for specific cargoes. As a result, barges carrying any of the cargoes in the new subchapter will display warning signs that identify the cargoes and their locations and Water Information Cards will be in the hands of any persons in charge of the barges. We feel that this is an important (Continued on page 162)

M/V SOUTHERN CITIES DISAPPEARANCE

The National Transportation Safety Board and the Commandant have announced their Actions on the Marine Board of Investigation convened to inquire into the circumstances surrounding the disappearance of the M/V *Southern Cities* in the Gulf of Mexico on or about 1 November 1966 with loss of life.

NATIONAL TRANSPORTATION SAFETY BOARD'S ACTION

This accident was investigated by the U.S. Coast Guard under the authority of R. S. 4450 (46 USC 239) and the regulations prescribed by 46 CFR 136. The Marine Board of Investigation was conducted in a public proceeding in Houston, Texas, beginning November 14, 1966. The Coast Guard report¹ of that investigation and the Commandant's action thereon is included in and made a part of this report.

The National Transportation Safety Board has considered those facts in the Coast Guard report of this accident investigation pertinent to the Board's statutory responsibility to make a determination of cause. By publication of this report the Board does not adopt those portions of the Coast Guard report which are concerned with activities within the exclusive jurisdiction of the Department of Transportation and the Coast Guard.

The National Transportation Safety Board finds that the basic cause of the accident with attendant loss of life was the unseaworthiness of the vessel for its employment. Vessels of this type, designed for service on inland waters, are extremely vulnerable to the perils of the sea when operating on unsheltered waters and distant from a harbor of safe refuge.

REMARKS

Based on the experiences of the tug *Southern Cities* on

¹ Due to space limitations the Coast Guard report of the Marine Board of Investigation is not printed herein.

four previous voyages from Freeport, Texas, to Tuxpan, Mexico, and characteristics of this vessel adduced by the Marine Board of Investigation, the NTSB concurs in the remarks of the Commandant who stated:

"The evidence indicates that the most likely cause was sinking after putting to sea on a voyage for which the vessel was unsuitable. In view of her design as a harbor tug, her size, her low freeboard, and her past performance, it is evident that the vessel was inadequate for ocean towing."

The Board also noted that diesel tugs under 300 gross tons are not presently subject to Coast Guard inspection, and no regulatory authority now exists to prevent similar accidents. Proposed legislation (H.R. 11216 introduced at the First Session of the 90th Congress by Congressman Garmatz) would require licensing of the person in charge of certain uninspected towing vessels but does not cover inspection. The NTSB supports H.R. 11216, but feels that as drafted this legislation would not prevent accidents similar to that experienced by the M/V *Southern Cities*. In comparing the fatality and injury experience of towing vessels with other industries (based on the Department of Labor and National Safety Council statistics), it is noted that the rates on towboats are much higher. While recognizing that these statistics are only as reliable as their source and comparisons may be misleading, the fatalities on towing vessels appear to be over three times that of U.S. industry as a whole.

Previous legislative proposals to bring these vessels under inspection have not been successful. The Safety Board recognizes the practical and economic problems of

inspection of presently uninspected towing vessels, but based on this accident, and the relatively high accident rates prevailing in the towing industry, feels preventive action is necessary.

RECOMMENDATIONS

The Safety Board recommends that the Department of Transportation and the Coast Guard give consideration to proposing legislation which would require some form of certification or rating of seaworthiness for towboats operating outside of the inland waterway system. One possible method of control is requiring a certification of seaworthiness as a condition of documentation of towing vessels for the coastwise trade.

By the National Transportation Safety Board:
27 May 1968

/s/ JOSEPH J. O'CONNELL, Jr.,
Chairman.
/s/ OSCAR M. LAUREL,
Member.
/s/ JOHN H. REED,
Member.
/s/ LOUIS M. THAYER,
Member.
/s/ FRANCIS H. McADAMS,
Member.

COMMANDANT'S ACTION

The record of the Marine Board of Investigation convened to investigate subject casualty has been reviewed and the record, including the findings of fact, conclusions, and recommendations, is approved subject to the following comments and the final determination of the cause of the casualty by the National Transportation Safety Board.

The M/V *Southern Cities* bound on a voyage to Tuxpan, Mexico was lost at sea in the Gulf of Mexico with six crewmembers on board after having departed Freeport, Texas on the evening of 29 October 1966 towing loaded barge B-1800 on a hawser. Other vessels in the Gulf of Mexico reported winds from the Northwest at 30 to 40 knots with seas 9½ to 13 feet. The last communication was received from the M/V *Southern Cities* at approximately 0630 (+6 zone time) on 1 November 1966 when, in the morning report to the owner she indicated her position to be latitude 24°30' north, longitude 96°40' west. The M/V *Southern Cities* failed to make her scheduled daily report on the morning of 2 November 1966. Although not yet overdue, when no position report was received from the *Southern Cities* on the morning of 3 November 1966, the owner reported to the U.S. Coast Guard rescue coordination center New Orleans, Louisiana

that there had been no communication from the vessel in the previous forty-eight hours and requested Coast Guard assistance in locating and establishing communication with the M/V *Southern Cities*. A search was made along the probable route of the tow by a Coast Guard aircraft with negative results. When no report was received from M/V *Southern Cities* on 4 November 1966 an intensive search by Coast Guard aircraft and a Coast Guard vessel was commenced at the request of the vessel's owner. The search, covering 84,600 square miles, continued until 8 November 1966. During this search, barge B-1800 was located at 0833 on 5 November 1966 drifting approximately 105 miles north of Tuxpan, Mexico. The barge was undamaged with her cargo intact and the tow line was still made fast. A life preserver, a broken section of the name board, and a ring life buoy from *Southern Cities* were later found at various positions. No other debris or equipment of the M/V *Southern Cities* was located. None of the crew of six persons on board the M/V *Southern Cities* have ever been found.

The M/V *Southern Cities*, Official Number 241635, of New Orleans, Louisiana, was a welded steel, single screw, diesel propelled towing vessel built in 1942. She was 85 gross tons, 67 feet in length, 19.1 feet in breadth, and 7.7 feet in depth. The M/V *Southern Cities*, being under 300 gross tons, was not subject to inspection by the U.S. Coast Guard. The vessel had never been in class with a recognized classification society. The persons serving as crewmembers on board the M/V *Southern Cities* were not required by law to be licensed or certificated by the Coast Guard. The M/V *Southern Cities* was equipped with a 20 man lifefloat, five thirty-inch ring life buoys and twelve life preservers. The vessel had last been drydocked at Houston, Texas on or about 13 September 1966.

Barge B-1800, Official Number 293266, of Houston, Texas is a 1,013 gross ton seagoing, bulk dry cargo barge built in 1944, with a registered length of 210 feet, a breadth of 40 feet, and a depth of 13.5 feet. The B-1800 was last inspected prior to the casualty on 14 March 1966 at Houston, Texas and a new certificate of inspection was issued. With calm wind and sea conditions the tow was normally able to make 5 to 6 knots with the engine of the *Southern Cities* turning at a full speed of 300 RPM. An eight inch polypropylene towing hawser 600 feet in length was normally used.

There is no evidence that the M/V *Southern Cities* had ever been employed in other than inland service until after 25 July 1966 when a contract was made to tow barge B-1800 between Freeport, Texas and Tuxpan Mexico. The vessel was lost on her fifth voyage, in that service, after having experienced difficulties on three of her four prior voyages.

On the first voyage of the M/V *Southern Cities* to Tuxpan, Mexico her automatic direction finder became

inoperative and the master, uncertain of his position while in sight of land, requested Coast Guard assistance. The tug and tow were located by aircraft approximately fifty miles north of Tampico, Mexico, a considerable distance from their estimated position. The direction finder was repaired upon completion of the voyage.

On her second voyage the M/V *Southern Cities* experienced generator trouble and her tow line became caught in the propeller.

On her fourth voyage, commencing on 8 October 1966 at Freeport, Texas, heavy weather was encountered and the master reported Northwest winds of 40 knots and 50 foot seas. Although rubber gasket material and additional hinges and dogs had been installed on the weather deck doors just prior to this trip, they proved not to be weather-tight and admitted great quantities of water to the engine room. Attempts to replace the half-doors fitted on the vessel with solid steel doors had also been made prior to this trip but were unsuccessful due to the insufficient clearance between the deckhouse and the bulwarks. Sea water also leaked into the engine room through faulty electrical fixtures on the main deck near the stern where the freeboard was only about three inches. At times both the engine driven bilge pump and the electric bilge pump were incapable of removing the volume of water entering the engine room.

The master requested that the Coast Guard fix the vessel's position and have a unit stand by the tug and tow as they were in danger due to heavy seas and high winds. The master reported to the Coast Guard vessel and aircraft arriving on scene that he might lose communications as he had lost main electrical power and his mast was in danger of being carried away. The master was

fearful of losing his tow and capsizing. It is reported that the amount of superstructure coupled with the light draft of the vessel complicated his problem in handling the tow, especially while turning in a heavy sea without fear of capsizing. Main electrical power was later restored and after the seas moderated the tow was able to proceed to its destination.

REMARKS

Concurring in the Conclusions of the Board, it appears that the M/V *Southern Cities* and her crew were lost in the Gulf of Mexico on a voyage between Freeport, Texas and Tuxpan, Mexico on 1 or 2 November 1966. Although the exact cause of the loss of the M/V *Southern Cities* could not be determined, the evidence indicates that the most likely cause was sinking after putting to sea on a voyage for which the vessel was unsuitable. In view of her design as a harbor tug, her size, her low freeboard, and her past performance, it is evident that the vessel was inadequate for ocean towing.

The unregulated operation of vessels such as the M/V *Southern Cities* has been a concern of the Coast Guard for many years and the problem has remained under continuous study. Recommendations for legislation have been proposed. In addition, it appears that the master of the M/V *Southern Cities* was unqualified for offshore navigation. Remedial legislation concerning this problem is now under consideration by Congress.

W. J. SMITH,
Admiral U.S. Coast Guard,
Commandant.

17 January 1968

Eye Injuries

A twinge in the eye while hammering on a chisel should be enough to send anyone to his eye doctor on

the double, even if the injury does not feel serious.

Dr. Clive B. Mortimer, ophthalmologist and staff member of the University of Toronto and the Toronto General Hospital, told a meeting of the university's post graduate medical education division, that 70 percent of persons who get metal fragments in the eye lose the sight of that eye.

He said, if fragments are left in, blindness always results. Even when removed, the success rate is only about 30 percent, but many patients come late—sometimes weeks or months after the accident. If they came immediately, chances of saving the eye are greater.

Dr. Mortimer said that 90 percent of the cases he sees result from industrial accidents, which could have

been avoided by wearing safety glasses. Often the victim is not the man actually performing the task, who may be wearing the safety glasses, but a man who walks through the shop while the job is going on.

Metal fragments, if left, destroy an eye because they leave microscopic

deposits which set up a reaction. Iron, copper, and steel are especially dangerous, but even some alloys leave deposits. Ferrous metals are removed by a giant magnet after an incision is made into the eye.

A major complication of the injury is infection. The fragment itself may

carry bacteria or a workman may rub his damaged eye with a dirty hand.

Even antibiotics can rarely clear infection in the interior of an eye, partly because parts of the eye have little direct blood supply, he said. ‡

Imperial Oil Limited Safety Bulletin

from Marine Office of America

CARGO DEEP TANKS

For liquid cargoes, cleanliness and tightness of tanks is essential.

To clean and prepare these tanks men must go into them and certain basic precautions must be observed.

The first and most obvious is to ventilate the tank and then test it. If the tank has carried a volatile liquid whose residue can give off explosive fumes, check with an explosive gas indicator if one is aboard. In its absence, take special pains in ventilating, even washing out if in doubt. For normal cargoes, testing with a flame safety lamp is a positive indication that there is sufficient oxygen to support life.

Cleaning of tanks is a messy, dirty, and slippery job. More and more, companies are turning to chemicals in an effort to speed up this operation and to minimize the exposure period. These chemicals when used as directed can be safely handled. However, they can be abused. Recently we ran across a number of eye

cases involving the use of a water wash detergent which was sprayed on the bulkheads with special equipment. Instead of using this special equipment, ships were applying the detergent with paint spray equipment that atomized the chemical so finely it floated in the air, entered into seamen's eyes and caused a great deal of temporary discomfort. When you receive a new type cleaner for such a job, read the instructions and follow them. Makeshift devices always cause trouble.

Many of the liquid chemicals carried as cargo are toxic and if spilled must be cleaned up. If a small leak develops, it may be necessary to use the oxygen breathing equipment or special respiratory equipment, and protective clothing.

The U.S. Coast Guard has recently published a revised edition of its chemical booklet entitled, "Chemical Data Guide for Bulk Shipment by Water," publication CG-388, edition of 1966. This booklet is available for \$1.25 through the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, and in general will list the precautions necessary in handling the large majority of bulk chemicals commonly carried by water. It makes a handy shipboard reference.

The operations or traffic department is usually able to contact the

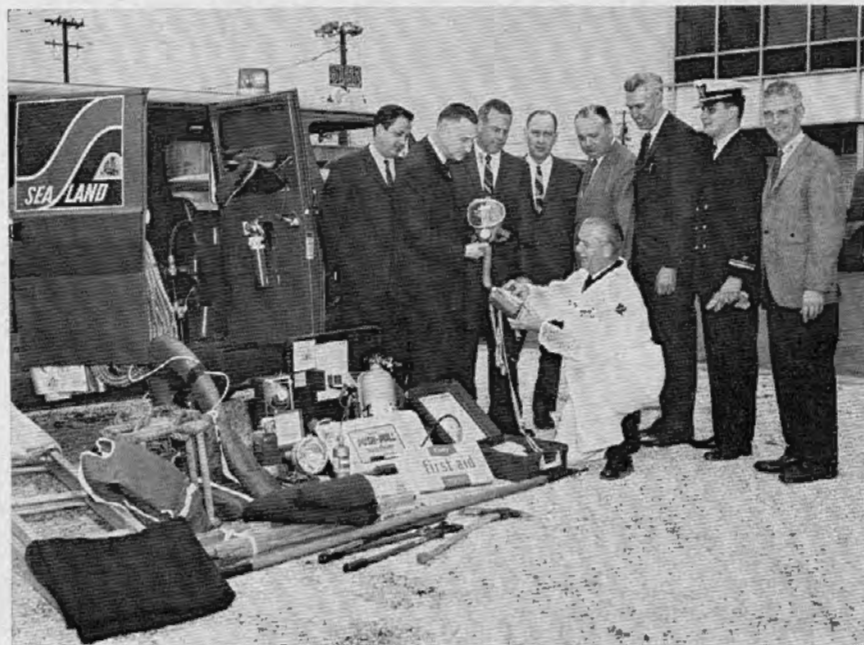
shipper or manufacturer where trade names are used or special instructions in handling are required. This information is invaluable for the Master or Mate in case anything goes wrong during the voyage. Also if specific firefighting or protective equipment is needed it can be secured and the vessel's personnel briefed on the special procedures to be followed.

When carrying general cargo in deep tanks, use of lift trucks should be avoided if possible, due to the carbon monoxide fumes emitted in the very confined space in which these machines must operate. Try to put cargo of a type which can be handled in the deeps; it is preferable to cargo which will tempt a stevedore to employ a machine. If a machine must be put in the deep tank, forced ventilation is essential and in far greater volume than in the normal 'tween deck, because a heavy concentration of exhaust fumes builds up very rapidly and is difficult to dissipate.

One final point, a wire bridle which can handle pontoons and hatch beams safely is very likely to be inadequate and unsafe for deep tank covers. It is far better to have special chain slings specifically for this use. ‡

Robert H. Smith, U.S.P. & I. Agency.

EMERGENCY VEHICLE DEMONSTRATED



George Stueber, chief of guards, Sea-Land Service, Inc., examines a gas mask, part of what has been called by shipping and labor officials as the most outstanding example of emergency aid equipment provided by a steamship operator in the Port of New York. The demonstration is observed by (left to right) Sea-Land's J. L. Clark, marine manager; C. E. Spitz, director, Loss Prevention and Claims; K. G. Younger, executive vice president; and W. O'Brien, manager, safety engineering. Also looking on are Captain G. D. Barlow of the New York Shipping Association; G. Armstrong, Sea-Land safety engineer; LTJG R. F. Prandl of the U.S. Coast Guard; and Joseph Leonard, safety director of the International Longshoremen's Association.

Weather Warning Changes

On March 1, 1968, the Weather Bureau altered its terminology for designation of coastal weather warnings. The changes are listed below.

"Whole Gale Warnings" will now be called "Storm Warnings," and the

"Whole Gale Warning Flag" will be known as the "Storm Warning Flag." Whenever winds are expected of 48 knots or more, "Storm Warnings" will be issued and "Storm Warning Flags" flown.

"Hurricane Warnings" will be issued only when a tropical cyclone that is expected to develop wind velocities of 64 or more knots is observed. "Hurricane Warning Flags" will be flown in anticipation of such a cyclone.

If an extratropical storm is observed, it will be designated simply as a "storm," even if it generates winds in excess of 64 knots. ⚓

Merchant Service Ribbons

In recognition of the important contribution American merchant seamen have made to the U.S. effort in Southeast Asia, the issuance of Vietnam service ribbons has been authorized by Acting Maritime Administrator J. W. Gulick, U.S. Department of Commerce. Seamen who have served at any time since July 4, 1965, in Vietnam waters aboard U.S. flag ships in the supply effort for the Vietnam conflict will be eligible for the service ribbon.

Mr. Gulick, in making the authorization, called attention to the patriotism of the seamen of the American Merchant Marine who voluntarily answered their country's call for men to serve the ships upon which our armed forces in Southeast Asia depend. "Many," said Mr. Gulick, "came out of retirement, or left shoreside jobs, to serve in the area where their skills were needed most. It is appropriate that their country should recognize the devotion and competence of these men who have served and continue to serve their country so well in so vital a mission."

Applications for the Vietnam Service Bar should be made to the Office of Maritime Manpower, Maritime Administration, Washington, D.C. 20235, giving complete name, Book or "Z" Number, name of vessel, and period of service. ⚓

nautical queries

DECK

Q. On a vessel at sea it is desired to check the metacentric height by employing the empirical formula:

$$T = \frac{.44 B}{\sqrt{GM}}$$

... where B is the vessel's beam of 50 feet and T is the full period of the vessel's roll which was carefully timed and an average value of 15 seconds obtained.

Required: The GM as given by using the formula.

NOTE: Full period means starboard to port then back to starboard (all included).

$$A. \sqrt{GM} = \frac{.44 \times 50}{15} = \frac{22}{15}$$

$$GM = \left(\frac{22}{15}\right)^2 = 2.15 \text{ feet}$$

Q. You are steaming up a river, with a six knot tide behind you; how would you bring the ship around head to the tide before docking?

A. Stop the engines and get the way off the ship, then drop the anchor on the bottom, letting her dredge around head to tide, then slack away the cable and bring her up.

Q. How would you turn a steamer with a right-handed propeller short round?

A. Hard right and full speed ahead. As soon as she has gathered headway, stop her. Full speed astern and when she gathers sternway helm hard left. When far enough astern, stop her, reverse the engines and helm, and repeat until the vessel is turned around.

Q. (a) What is the duty of the Master of a vessel with respect to sanitation?

(b) What penalties is the Master of a vessel liable to for failure to maintain his vessel in a sanitary condition?

A. (a) It shall be the duty of the master to see that the vessel, and, in particular, the quarters are in a clean and sanitary condition. The Chief Engineer shall be responsible only for the sanitary condition of the engineering department.

(b) In addition to the provisions of RS 4450 pertaining to Revocation and Suspension hearings for Masters negligent in their duties, a penalty of not more than \$500 may be levied on the Master or other licensed officer responsible for failure to maintain the vessel in a sanitary condition. The Coast Guard may also withdraw the Certificate of Inspection from the vessel.

ENGINE

Q. How should hose used for filling potable watertanks be stowed, and what care should be taken in handling such hose?

A. A separate hose should be kept on each vessel and used only for loading potable water. Under no circumstances should nonpotable liquids pass through it. If there is a hose at the pier where potable water is loaded, none need be kept on the vessel. If the specific needs of the vessel are not known, at least two 50-foot sections of hose should be provided for this purpose. The hose should be durable, with a smooth, impervious lining, and should be equipped with the fittings necessary to permit connection to the source hydrant and filling line. The hose should be handled so that the ends are not dragged through or accidentally dropped into contaminated water, or otherwise contaminated.

It is desirable to have the potable water filling hose stowed near the vessel's filling line, preferably in a closed cabinet so that it will be easily accessible at all times. This will minimize the possibility of crewmembers using another hose, one which might be contaminated. The hose cabinet or stowage space should be clearly labeled with a sign reading "Potable Water Hose Only." The words "Drinking" or "Culinary" are acceptable on signs already in place. When new signs or labels are necessary the words "Potable Water Hose Only" should be used. The word "fresh" is not considered satisfactory.

If the hose is not stowed in a closed cabinet, the ends should be plugged or capped with threaded metal fittings to minimize contamination of the inside surface. The hose should be stowed high enough above the deck to prevent submergence in deck washwater.

Q. What is the effect of having a very light loading in one compartment when the ship is otherwise loaded as to be at or near her maximum draft?



A. The hydrostatic pressure on the bottom of the light loaded compartment, having no counteracting weight, creates higher local stresses in the bottom structure.

AMENDMENTS TO REGULATIONS

Title 46 Changes

DRYDOCK AND TAILSHAFT EXAMINATIONS

Ocean and Coastwise Cargo and Tank Vessels

The purpose of the amendments in this document is to revise the requirements regarding drydock and tailshaft examinations of ocean and coastwise cargo and tank vessels by providing that such vessels may be drydocked every 24 months rather than every 18 months, and by providing for their tailshaft drawing every 48 months rather than 36 months. Pursuant to 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 proposed changes included changes in the drydock and tailshaft examination requirements, which were identified as Item PH 7-68 (CG-249, pages 245-248, inclusive). All comments received were favorable to these proposals. As recommended by the Merchant Marine Council, these proposals are approved.

By virtue of the authority vested in me as Commandant, U.S. Coast Guard, by section 632 of Title 14, United States Code, and the delegation of authority of the Secretary of Transportation in 49 CFR 1.4(a)(2) to promulgate regulations in accordance with the laws cited with the regulations, the following amendments in this document are prescribed and shall be effective on and after July 1, 1968: *Provided*, That the regulatory amendments in this document may be complied with during the interim period prior to the effective date specified in lieu of existing require-

ments at the option of the owners of cargo and tank vessels.

The complete text of these amendments is published in the Federal Register of June 1, 1968.

SUBCHAPTER N—DANGEROUS CARGOES

PART 146—TRANSPORTATION OR STOWAGE OF EXPLOSIVES OR OTHER DANGEROUS ARTICLES OR SUBSTANCES, AND COM- BUSTIBLE LIQUIDS ON BOARD VESSELS

Miscellaneous Amendments

Pursuant to 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 2-68 contained the proposals regarding dangerous cargoes (CG-249, pages 121 to 182, inclusive). This document contains miscellaneous amendments to the dangerous cargo regulations, which were identified as Item PH 2c-68 (CG-249, pages 124 to 143, inclusive) (33 F.R. 3566). The miscellaneous proposals regarding radioactive material in this Item are not included but will be set forth in a separate document containing the revised requirements governing radioactive materials.

The written comments received were considered and changes based thereon have been made. In the commodity list in 46 CFR 146.04-5 the listing for "empty portable tanks" was changed to show that the tank may or may not come within the classification shown, which is similar to the arrangement for empty tank cars and tank trucks. The comment regarding 46 CFR 146.27-100 governing empty portable tanks was accepted and the change provides

that no excess residue of a previous lading adhering to any exterior part of the tank is permitted. The comment regarding tween deck stowage of empty portable tanks was not accepted. The various sections amended containing references to "ICC" or "Interstate Commerce Commission" were editorially changed to reflect the changes made by the Department of Transportation Act. The proposals in 46 CFR 146.29-15(a) were revised to agree with regulations in 33 CFR 126.16. The proposal designated 46 CFR 146.29-35(g), regarding control of weapons of security guards, was not adopted.

The provisions of R.S. 4472, as amended (46 U.S.C. 170), require that the land and water regulations governing the transportation of dangerous articles or substances shall be as nearly parallel as practicable. The provisions in 46 CFR 146.02-18 and 146.02-19 make the Dangerous Cargo Regulations applicable to all shipments of dangerous cargoes by vessels. The Department of Transportation, through the Hazardous Materials Regulations Board, prescribes the implementing regulations for "Hazardous Materials" under the statutory authority in sections 831-835, Title 18, United States Code. These regulations are published in 49 CFR Parts 171-190 (formerly ICC regulations published in 49 CFR Parts 70 to 90). Miscellaneous changes have been made in the regulations in 49 CFR Parts 171-190, which are now in effect for land transportation. Various amendments to the Dangerous Cargo Regulations in 46 CFR Part 146 have been included in this document in order that these regulations governing water transportation of certain dangerous cargoes will be as nearly parallel as practicable with the regulations which govern the land transportation of the same commodities.

The amendments to 46 CFR Part 146, which were not described in the Federal Register notice of proposed rule making published on Febru-

ary 29, 1968 (33 F.R. 3566, 3567), are considered to be interpretations of laws, or revised requirement to agree with existing regulations, or editorial in nature, and it is hereby found that compliance with the Administrative Procedure Act (5 U.S.C. 551-559) (respecting notice of proposed rule making, public rule-making procedure thereon, and effective date requirements thereof) is unnecessary with respect of such changes.

By virtue of the authority vested in me as Commandant, U.S. Coast Guard, by section 632 of Title 14, United States Code, and the delegation of authority by the Secretary of Transportation in 49 CFR 1.4(a) (2) (32 F.R. 5606), to promulgate regulations in accordance with the laws cited with the regulations, the following amendments are prescribed and shall be effective July 1, 1968; however, the regulations in this document may be complied with in lieu of existing requirements prior to that date.

The complete text of these amendments is published in the Federal Register of June 7, 1968.

Title 33 Changes

SUBCHAPTER D—NAVIGATION REQUIREMENTS FOR CERTAIN INLAND WATERS

PART 82—BOUNDARY LINES OF INLAND WATERS

Atlantic Coast; New York Harbor

The purpose of the amendment to 33 CFR 82.20 in this document is to move the northern end of the demarcation line from the Rockaway Point Coast Guard Station to East Rockaway Inlet Breakwater Light and to change the terminology of reference points to conform with what is presently used. Pursuant to 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 proposed changes included the change in the boundary line for New York Harbor, which was identified as Item PH 5-68 (CG-249, page 209). One favorable comment was received concerning this proposal. As recommended by the Merchant Marine Council, this proposal is approved.

By virtue of the authority vested in me as Commandant, U.S. Coast Guard, by section 632 of Title 14, United States Code, and the delegation of authority of the Secretary of Transportation in 49 CFR 1.4(a) (2) to promulgate regulations and amendments in accordance with the laws cited with the regulations, the following amendments in this document are prescribed and shall be effective on the 31st day after the date of publication of this document in the Federal Register.

The complete text of these amendments is published in the Federal Register of June 4, 1968.

STORES AND SUPPLIES

Articles of ships' stores and supplies certificated and canceled from June 1 to June 30, 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

Oil Technology Corp., 99 East Hawthorne Ave., Valley Stream, N.Y. 11580; Certificate No. 814, dated June 11, 1968, TECHNOL.

Dewitt Chemical Co., P.O. Box 343, Atlanta, Ga. 30301; Certificate No. 815 dated June 4, 1968, DEWITT FORMULA 155 Solvent Degreaser & Cold Cleaning Solvent.

CANCELED

Bull & Roberts, Inc., 785 Central Ave., Murray Hill, N.J., 07971; Certificate No. 814 dated May 27, 1968, BROMAR Tank and Bilge Cleaner.

AFFIDAVITS

The following affidavits were accepted during the period from May 15, 1968, to June 15, 1968:

Hydrasearch Co., Annapolis Science Center, Annapolis, Md. 21401, FITTINGS.¹

Kerotest Manufacturing Corp., 2525 Liberty Ave., Pittsburgh, Pa. 15222, FITTINGS.²

Essex Wire Corp., 303 N. Jackson St., Andrews, Ind. 46702, FITTINGS.

Posi-Seal International, Inc., Routes 49 & U.S. 95, Westerly, R.I. 02891, VALVES.³

John W. Moon, Inc., 220 Cherry St., Philadelphia, Pa. 19105, VALVES, FITTINGS & FLANGES.

Flowmatics, Division of Crane Co., P.O. Box 548, Folsom, Calif. 95630, VALVES & FITTINGS.

REGULATIONS

(Continued from page 154)

step in assuring that operating people are properly informed about potential hazards of their cargoes and that effective measures can be taken in the event of casualties.

This, then, is our latest thinking and plans for bulk dangerous cargoes regulations. While the regulations described here apply only to barges carrying liquids and liquefied gases, we feel they have pioneered a new approach which will influence all types of bulk dangerous cargoes regulations not only in the United States, but internationally. ‡

¹ Acceptance applies to 6" Universal Flange Couplings and 6" Safe-T-Caps blank flanges limited to Class II piping and a maximum pressure of 150 psi.

² Acceptance applies to 6, 8, 10 & 12" Doc Dapter Universal Flange Couplings for use at a maximum operating pressure of 275 psi and operating temperature of 450° F.

³ Resilient Seat Butterfly valves suitable for Category "B" Valve applications.

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, are now available from the Superintendent of Documents, price: \$2.50.

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.
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 Certifying of Merchant Marine Personnel (2-1-65). F.R. 2-13-65, 8-21-65, 3-17-66, 10-22-66, 12-6-66, 12-13-66, 6-1-67, 11-16-67, 4-12-68.
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 (11-1-66). F.R. 4-12-68.
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, 4-10-62, 4-24-63, 10-27-64, 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 JUNE 1968

The following have been modified by Federal Registers:

CG-115, CG-123 and CG-257 Federal Register June 1, 1968.

CG-169, Federal Register June 4, 1968.

Dangerous Cargoes Regulations, Federal Register June 7, 1968.

