PROCEEDINGS

OF THE MERCHANT MARINE COUNCIL

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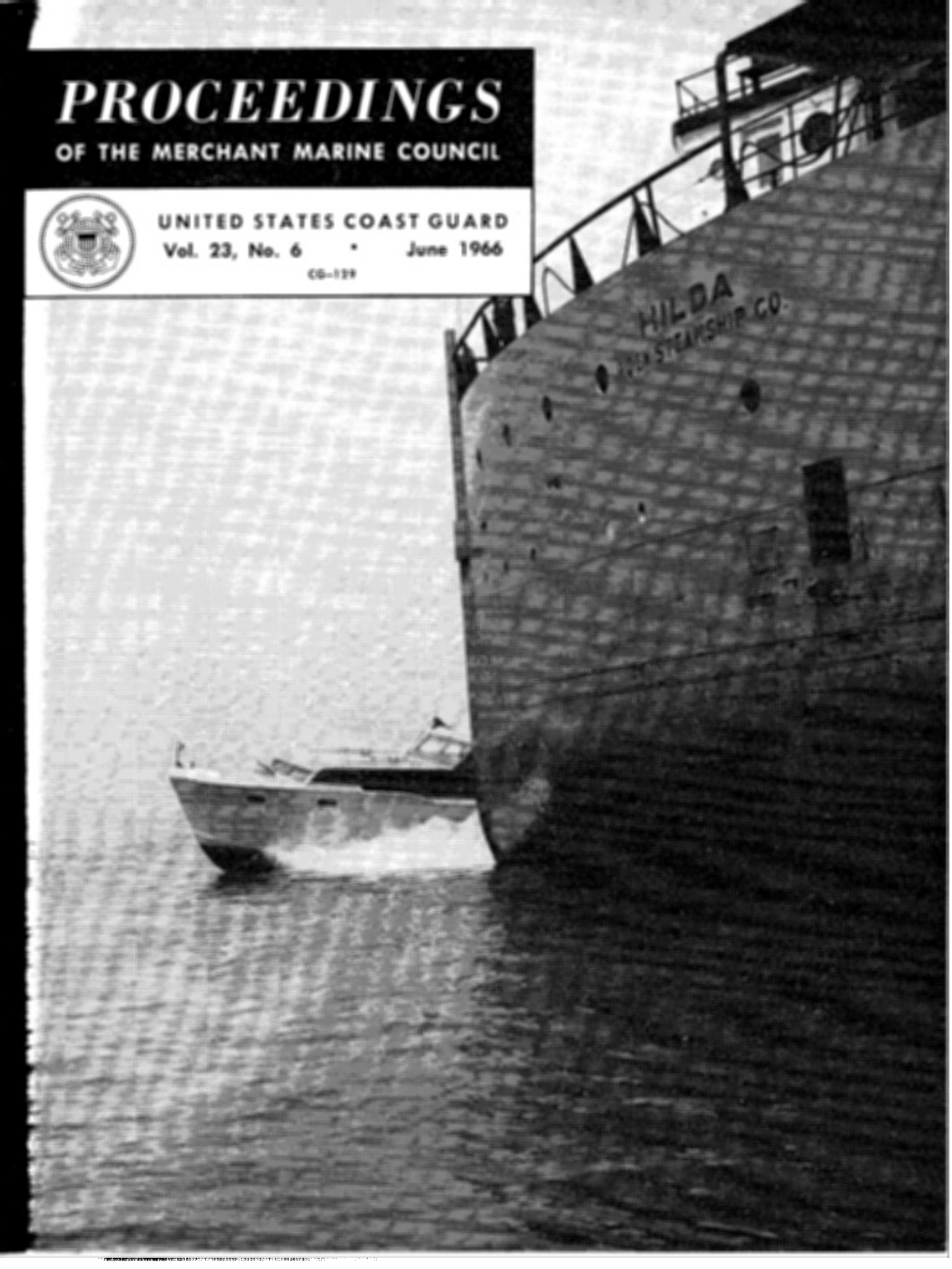

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PROCEEDINGS

OF THE

MERCHANT MARINE COUNCIL

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COVERS

FRONT: A pleasure boat sweeping closely around the bow of an anchored lakes carrier.

BACK: Small recreational boats anchored and berthed at Prospect Park near Philadelphia, Pa.

Lieutenant A. J. Arnett, USCG, *Editor*

T. A. DeNardo, *Assistant Editor*

DIST. (SDL NO. 82)
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F: None
List 141M
List 111

Pilothouse view of refrigerated anhydrous ammonia barges.

Safety grows with understanding

William E. McConnaughey

June 1966

IGNORANCE MAY BE BLISS but it certainly isn't safety, and especially in modern marine bulk dangerous cargo transportation. The rapid changes and increasing complexity of this dynamic field are making knowledge of safety and understanding of hazards take on new dimensions and importance. In fact, probably the most important job in dangerous cargo safety today is assuring that knowledge in the right form is in the right hands at the right time, knowledge which leads to understanding of hazards and to safety through proper designs and operating procedures.

All of us are aware that this is a period of change although probably few can really comprehend the magnitude of the changes which undoubtedly lie ahead. We can make only very uncertain predictions of what marine transportation will be like after concepts such as nuclear power, hydrofoils, hovercraft, submarine tankers, automation, etc., have

One of the characteristics of the chemical industry which is of special interest to the Coast Guard is its water orientation. Almost without exception, new chemical plants are built on navigable waterways to obtain needed process and cooling water and to obtain the economic benefits of low-cost water transportation.

been thoroughly exploited. However, we can take a look at some of the changes already underway that affect safety in shipping bulk dangerous cargoes. One of the most important of these is the rapid growth in the amount of chemicals being shipped by water. The production of basic organic and inorganic chemicals has doubled in the last 10 years and, since 1958, it has grown at a rate which indicates a doubling in 7 years.

Growth of population in the United States is frequently referred to as "explosive"; the growth in production of petroleum products is even more so. We apparently are in only the early stages of a tremendous increase in the production and per capita use of chemicals. Since chemical manufacturing is now a major industry, expected percentage growth represents many tons of products, much of which will require transportation. Another observation is that chemicals can be expected to become an increasingly large percentage of all dangerous commodities transported in bulk since petroleum products comprise the largest single class at present.

However, from the standpoint of safety and the need for knowledge, variety of commodities is as important as volume. Growth and economic success in the highly competitive chemical industry are based on research aimed at finding new products and new processes to make large-scale production of laboratory chemicals economically feasible. Chemical producers spend more of their own money on R. & D. than any other industry and at a rate which is well over twice the general industrial average. The intensity of this drive to be first on the market with a new or cheaper product is indicated by the fact that over 500 new or improved chemicals are introduced each year and also by the fact that over half of the products sold today have been introduced since 1939. As a result, we can expect the great growth in volume of chemicals transported in the future to be accompanied by a great growth in variety, a situation which clearly indicates the need for a new scope of knowledge and understanding of hazards by all concerned with transportation.

In 1964 alone, some 426 industrial facilities were built, expanded or planned along inland navigation channels and, of these, 116 were chemical or petroleum plants. Thus, much of the expected increases in volume and variety of bulk dangerous cargoes can be expected to be seen in water transportation.

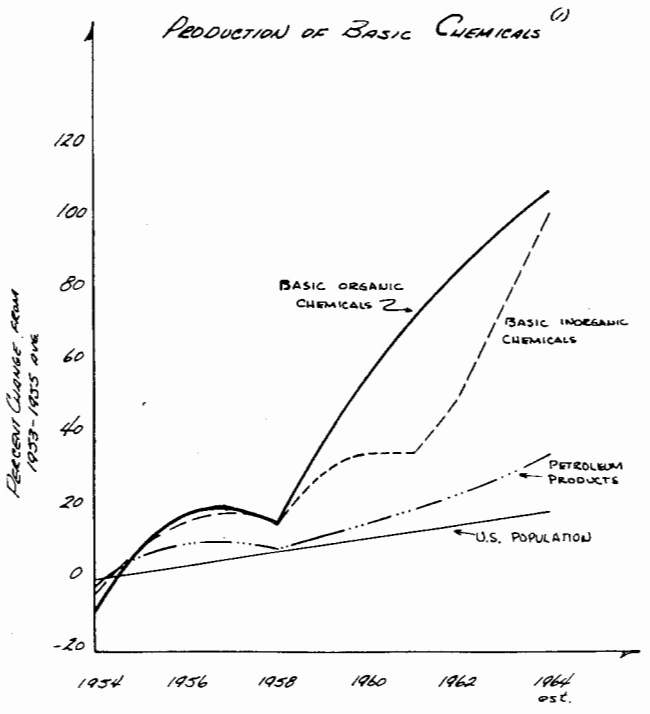
There is another possible development which could have a sizable effect on the amount of chemicals moved by ship in U.S. waters. This is the foreign trade subzone concept which appears to have a good chance of more widespread use. Under this system, designated chemical plants are operated in the United States using foreign feedstocks brought in by ship without import duty or restriction and the chemical products are then freely moved by ship without export restrictions. An essential element of this procedure is water transportation and, if this procedure becomes common, it will further accelerate the growth in bulk shipment of chemicals.

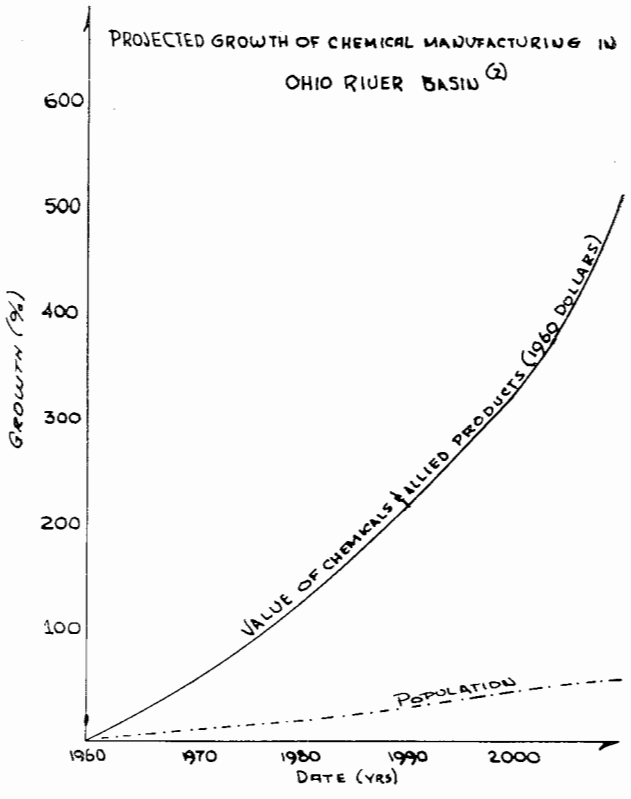
Thus, for several reasons we can look forward to sizable increases in the amount and variety of chemicals shipped in bulk in the future. The significance, of course, is that a much broader knowledge of commodity properties and hazards will be necessary in the marine industry than has been the case in the past.

Actually, these remarks are not referring to some abrupt occurrence in the future; bulk chemical transportation is already increasingly evident on the water. Ships carrying several chemicals at once are no longer rare, although they may escape notice because they look like conventional petroleum tankers. These are the so-called drug store tankers whose function is to carry a wide variety of cargoes and whose keyword is "flexibility." You may have noticed the advertisements by a foreign flag operator that say "we carry any cargo—so long as it is liquid". One company alone has increased the number of such ships in its fleet from 5 to 16 in the last 3 years. United States coastal tankers carrying diverse cargoes such as caustic soda, styrene, carbon tetrachloride, and ethylene glycol are typical. Their facilities include such features as ventilation air dryers, nickel clad tanks and pumps, vent line desicators, and insulated and heated tanks.

Obviously, safe design and operation of this type of ship requires a more extensive understanding of commodity properties and hazards than does a conventional petroleum tanker. Liquefied gases at low temperatures, as well as a variety of true liquids, are carried in integral and deck tanks. Facilities include inert gas generators, vapor compression and indirect cargo cooling equipment, centralized cargo transfer controls, etc. The initial proposal called for carrying ethylene oxide, propane, anhydrous ammonia, and styrene but already at least 22 other chemicals have been proposed. The breadth of knowledge required to understand the cargo hazards involved in operating this ship is truly impressive and it includes comprehension of such things as thermal stability, cargo compatibility, toxicity, catalysis, and polymeric reactions.

Bulk chemical transportation is increasingly evident on the rivers, too. A molten sulfur tow over 1,000 feet long and containing 9,200 tons of cargo is no longer rare. Each barge has its own unmanned boilerroom for heating and circulating heat transfer fluid to maintain the cargo at 260–270° F. Undoubtedly, the fastest growing chemical on the river these days is anhydrous ammonia. This commodity is carried as a refrigerated, liquefied gas. Cooling is provided by vapor compression refrigeration equipment. These examples really only indicate things to come. We can expect the present trend toward converting solids and gases into liquids for transportation and storage to grow and cargo temperatures will range farther and farther from ambient. On the high side, molten aluminum at over 1,200° F. appears to be a possible future cargo and, on the low side, liquid hydrogen at —423° F. is making its debut on the water in barges. There are many economic advantages in handling gases as low temperature liquids and there is rapid





growth of interest in this practice. Cryogenic gases are the extremely cold ones which boil below —135° F. but there is equal interest in the somewhat warmer gases which are still cold enough to create new problems in containment and casualty control.

One of the important elements of changing conditions is population. Projected increases in the number of people in the United States and the world are truly awe-inspiring, almost impossible to comprehend. Effects will be felt in all areas and this will include water transportation. Obviously, more people means more congestion on and around waterways which, in turn, increases the possibility of accidents involving dangerous cargoes and the potential seriousness of their effects. Less obviously, however, more people means much greater concern with the conservation of our water and air resources. Each type of user—sportsman, marine transporter, industrial consumer, etc.—will have to consider more and more the interests of others and to understand the technical nature of these interests. Pollution to the marine industry has traditionally meant oil but, in the future, it will be necessary to understand the consequences of introducing any material into the air or water. One example of the growing concern over water pollution, is evidenced by the deployment of a State of West Virginia surveillance boat which monitors water quality in the Kanawha River near Charleston, W. Va. While this activity is not directed primarily at transportation as a source of contamination, it is certainly included. Air is also being increasingly monitored for pollution levels and sources and there is little doubt that release of cargo vapors in water transportation by venting, gas-freeing, spills, etc. will attract closer attention in the future. A new type of knowledge will be necessary both in the design and the operation of vessels engaged in the transportation of bulk quantities by water if these pollution aspects are to be approached intelligently.

From this, it is evident that the Coast Guard feels that the transportation of bulk dangerous cargoes is in the early stages of a period of rapid change and that we are convinced that a broader understanding of hazards will be essential in all phases of marine transportation in the future. The logical question then is what are we doing to promote safety through understanding and to keep our regulations in step with changing times? Before answering this with a discussion of some of our current and recent activities, let me say a word about a couple of elements of our regulatory philosophy. First, we believe very strongly in a preventive approach rather than a corrective approach and we expend considerable effort in predicting hazards without waiting for them to become casualty statistics. Of course, we study the past for its lessons, too, but constantly changing cargoes and conditions as well as the potential magnitude of casualties involving modern chemicals make statistical studies only one of the tools to be applied. We can't afford even one more Texas City disaster or *Sulphur Queen* disappearance or chlorine barge sinking if advance thinking and analysis can prevent it. Of course, it's extremely difficult to anticipate all the casualties which might occur with widely varying chemical cargoes but we believe much can be done by developing principles and fundamentals which can be used to evaluate and compare the hazards of commodities as they are proposed for bulk shipment.

Another element of our philosophy is that we should draw on many outside sources for assistance but should also maintain a competent staff to evaluate the advice which thus becomes available. In other words, we

Ullage measurement on a tanker.

must avoid the extremes of being either an isolated, "know-it-all" organization or of being merely a rubber stamp for vested interests. So far as staffing is concerned, I will only say that we feel we have a good, well rounded team and, as a chemical engineer, I, personally, am proud to be a member of it. However, perhaps a few words are in order about our methods of getting outside assistance in the complex business of dangerous cargo regulation. Regulations flow in the form of proposals to a public hearing and then in final form to the Federal Register and finally to industry for compliance. Of course, public hearings are an important source of advice but a great deal of knowledge and advice is obtained before that stage. Four groups constitute our formal, continuing advisory groups which fall into two main categories. The NAS–USCG Advisory Committee on Hazardous Materials and the Advisory Center on Toxicology may be classed as scientific and their function is to provide assistance on technical problems arising in connection with regulation development. However, they do not deal directly with regulations. Members of these groups are selected by the National Academy of Sciences on the basis of personal qualifications and each serves as an individual rather than as a representative of an organization or industry. The other two groups, the Chemical Transportation Advisory Panel and the Western Rivers Panel may be classed as industry. They provide a vital service by advising the Coast Guard on commercial practices and problems and by assisting in the detailed preparation of regulations which are economically feasible. Members are appointed by the Commandant on the basis of industry recommendations with the objective of obtaining broad representation for the chemical, petroleum and marine industries. Such representation is essential in the development of sound regulations and these two groups have made major contributions to all of our recent bulk dangerous cargo regulations, for example, the drafting of ethylene oxide regulations by the Chemical Transportation Advisory Panel. Thus, "scientific" and "industry" advisory groups complement and supplement each other in their assistance to the Coast Guard. And there are other sources of information. A large number of organizations and individuals assist the Coast Guard on an intermittent, limited scope basis. These include safety and trade organizations, individual companies, Government agencies, professional societies, academic organizations. These are all very important to the Coast Guard and our personnel actively participate in or closely associate with many such groups. However, they differ from our four advisory groups and serve a different although complementary purpose.

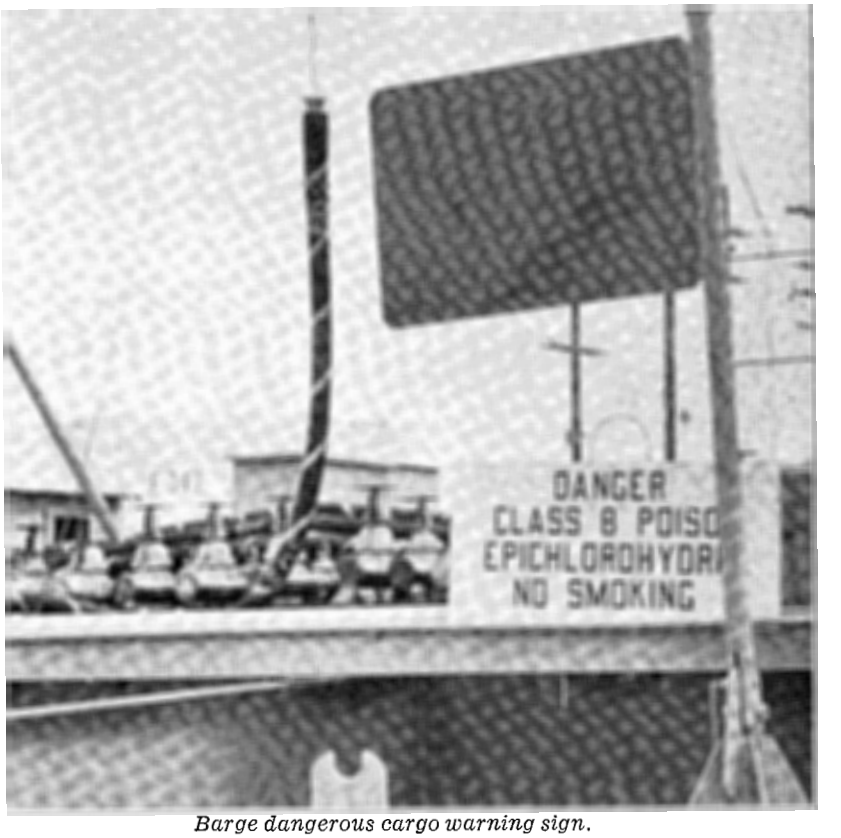
After this somewhat philosophical digression, let's return to the question of what the Coast Guard is doing to promote safety through understanding and to keep our regulations in step with changing times.

In the area of increased understanding, we feel that the new requirement that warning signs, information cards and specially qualified personnel be used with certain bulk dangerous cargoes is an important step forward. Barges carrying any of 19 specific bulk commodities must follow these special handling procedures. The purpose of these new requirements is to provide personnel moving and handling commodities which have significant hazards other than or in addition to fire with information—and, hopefully, an adequate understanding—about these hazards. This, of course, is an example of trying to "get the right information in the right form in the right hands at the right time." The main problems have been in deciding what the right information and the right form are. The right information in this case is certainly not everything that is known about the commodity and the right form is not a technical treatise written for professional chemists and engineers. In this case, emphasis should be more on the "what" than the "why" what to do in case of exposure to acetone cyanohydrin but not why amyl nitrite vapor is an effective antidote. Although a relatively low level of understanding is adequate for users of information cards, a much higher level is necessary for their preparation and the conversion problem can be difficult. Although our regulations do not prescribe wording or require detailed approval of individual information cards and warning signs, we have worked closely with several companies and trade associations in developing wording which meets the intent of the regulations. This has been very helpful to us in increasing our understanding of the problem of interpreting and communicating technical information to nontechnical personnel.

There are no firm plans about the future of this program but, in spite

of very limited experience to date, several observations can be made. One of these is that the rigid requirement for giving commodity classification on the warning sign is probably of questionable value. It does not appear logical to *warn* people that chlorine and anhydrous ammonia are nonflammable gases, especially since this is not strictly true in the latter case. Another observation is that commodity coverage probably should be extended in the future. If safety does indeed grow with understanding, the program to put information on hazards, properties and emergency procedures in the hands of transportation personnel probably should be enlarged beyond the presently specified groups to include any dangerous commodity. Furthermore, such information undoubtedly should be in the hands of seagoing personnel too although their conditions are different and the safety knowledge they need would not necessarily be the same as for barge operations.

Another of our actions in the area of increased understanding has been preparation of a book entitled "Chemical Data Guide for Bulk Shipment by Water." In this case, the intended users, or "right hands," are our own Coast Guard field personnel who face a broad spectrum of questions on chemical hazards in coordinating rescue operations, reviewing vessel plans, inspecting vessels and carrying out port security operations. The "right information" is broader and more technical than for information cards and it must satisfy needs which range from a convenient compilation of physical, chemical and toxicological properties for use in barge and ship design considerations to terse information on recommended emergency procedures for use in the event of casualties. Developing an answer in the "right form" for these needs, and others which may not have been recognized, is a difficult task. Our approach has been to prepare a very limited first edition which has been sent to our field personnel and to a limited number of outside individuals for constructive criticism of format and content. It is planned to prepare a revised and improved edition in the near future which will have widespread availability—for outside organizations, this will probably be by purchase from the Superintendent of Documents. The target date is March 1966. The flood of requests for copies of the first edition and the enthusiastic cooperation received in making improvements indicates that there is a great need in the marine industry for such a publication. We view it as a living document which will remain flexible and grow and change to meet changing needs. One of its useful functions may be to identify holes in our knowledge and to stimulate efforts to fill them. For instance, preparation of the first edition has revealed that there is a general lack of information on what concentration of cargo vapors are safe for humans to breathe for short periods of time, such as when entering tanks or taking ullage readings or in public exposures resulting from accidental release of volatile cargo. The need for such knowledge to permit predictions and assessments of hazards is evident and the Data Guide may be the means of getting the missing information developed or uncovered from unpublished files.



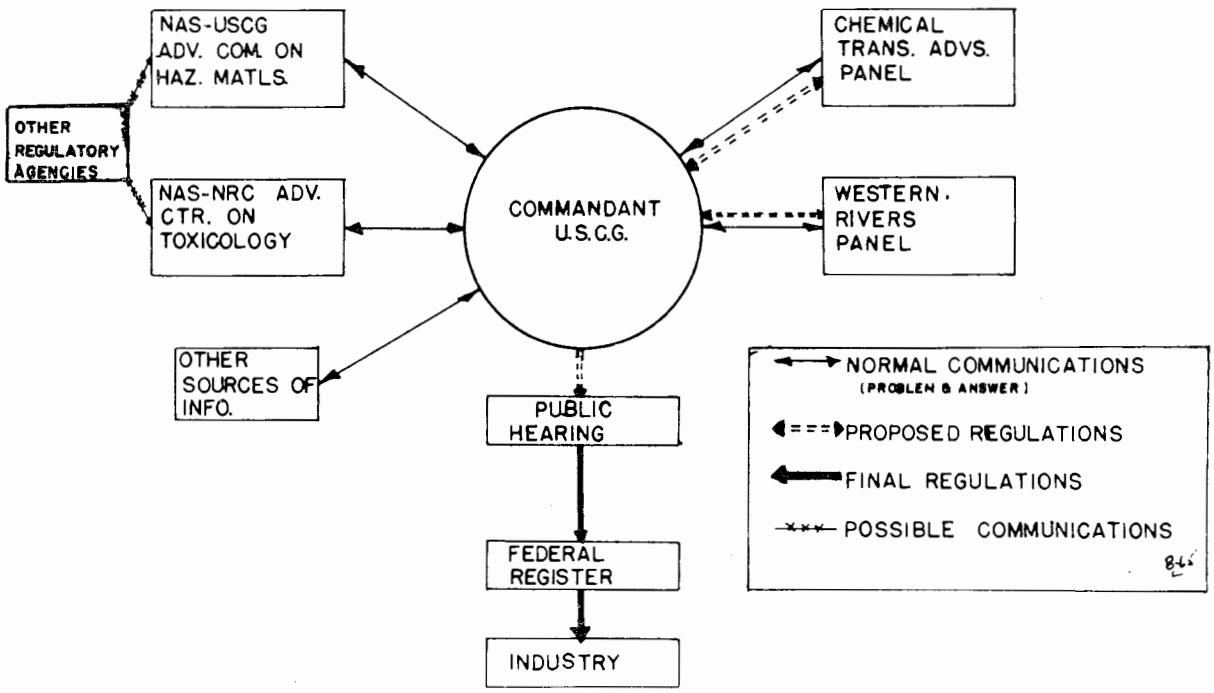
Barge dangerous cargo warning sign.

One of our sources of information which will become more important in the future is a questionnaire with the self-explanatory title, "Characteristics of Liquid Chemicals Proposed for Bulk Shipment". This is used to request fairly extensive information from the manufacturer on flammability, reactivity, compatibility, toxicity, production and use, and proposed cargo handling methods for any commodity which is new to bulk water transportation and which may present significant hazards differing from those of normal petroleum products. Although such a questionnaire is not new, it has been revised recently and will be used more extensively in the future. While there is no doubt that this is an important source of information, its value in developing an understanding of hazards depends on asking the right questions and on the availability of answers.

We feel that the proper approach to safety with widely varying bulk cargoes is to develop principles and orderly hazard evaluation procedures. Much of our effort along these lines is centered in our two scientific advisory groups, the NAS–USCG Advisory Committee on Hazardous Materials and the Advisory Center on Toxicology. Comments on the approach to safe handling of one commodity should be illustrative.

Although molten sulfur transportation by ship and barge has become quite common in the last few years, the loss of the *Marine Sulphur Queen* raised some question about the adequacy of our knowledge of the commercial product. As a result, the Committee on Hazardous Materials was asked to review existing knowledge about hazards associated with

U. S. COAST GUARD ADVISORY GROUPS FOR DANGEROUS CARGOES



commercial molten sulfur, determine if there are any "holes" in our understanding of the hazards and, if so, make recommendations on any research necessary to fill the gaps in our knowledge. A task group of industry, Government and academic personnel was formed under the Committee and it has now completed the review phase and has identified the following needs:

(a) A method of predicting the rate of explosive gas generation as a function of temperature, agitation, and composition. This is important in setting minimum cargo ventilation rates.

(b) Resolution of the controversy about the presence of carbon disulfide in the evolved gases. This is important because CS_2 has an extremely low ignition temperature and ignition energy.

(c) Determination of flammable limits of mixtures of carbon disulfide and hydrogen sulfide, if both are present.

(d) Development of a standardized test for determining the compatibility of organic heat transfer fluids with commercial molten sulfur.

Answers to these questions will give the Coast Guard a sound basis for generalizing sulfur transportation requirements and eliminate the present uncertainties about the effects of changing conditions and cargoes. Typically, close and enthusiastic cooperation is being received from industry technical personnel and the necessary experimental work is underway in laboratories and on sulfur carrying vessels.

Part of the effort to develop and understand underlying chemical safety principles is the holding of periodic symposia on subjects of direct interest to water transportation. Two meetings of this nature have been held by the NAS–USCG Advisory Committee on Hazardous Materials, the first at Warrenton, Va. in July 1964 and the second at Charleston, W. Va. in July 1965. Subjects covered have included stability and compatibility of substances, sources of chemical safety information, barging of chemical cargoes, chemical plant safety, and water pollution. These meetings have been of great value to the Coast Guard and to invited attendees in developing a better understanding of chemical safety in water transportation.

The Coast Guard is quite active in promoting safety through understanding and this activity is stimulated by our belief that bulk dangerous cargo transportation is in the early stages of a period of rapid change. What, then, are we doing with our regulations to keep them in step with the times? In the last

couple of years a number of additions and changes have been developed and promulgated, such as those for open hopper barge special operating requirements, ethylene oxide, barge hull types, information cards and warning signs, etc. All of these are concerned with the general problem of safety in bulk transportation of dangerous cargoes other than conventional petroleum products. However, for some time, we have felt that a more comprehensive approach is needed. A Coast Guard Special Task Group established to study the problem concluded that a new subchapter should be developed to properly recognize all types of hazard which may be created by such commodities in water transportation and to consolidate pertinent regulations presently scattered in three other subchapters. Further development of the Task Group's concepts and the actual drafting of proposed regulations is now underway as a special project in the Merchant Marine Technical Division at Coast Guard Headquarters, with the close cooperation of a Chemical Transportation Advisory Panel task group. A great deal of work still lies ahead but the task now has been pretty well defined and the underlying concepts developed.

Perhaps a summary of our present thought will be of interest. The objective of the new regulations is to prescribe, in a single subchapter, the cargo carrying requirements for bulk water transportation of all hazardous commodities other than those liquids whose only significant hazard is flammability or combustibility i.e., requiring oxygen and an ignition source. The scope will be such that, on a commodity basis, all dangerous and hazardous cargoes will be included except the following which are provided for in Subchapter D (Tank Vessel Regulations):

(1) Flammable and combustible liquids which have no other significant hazard.

(2) Liquefied flammable gases which have no other significant hazard.

(3) Solids carried in molten form at elevated temperatures which have no significant hazard other than flammability or combustibility.

On a vessel and containment basis, the new subchapter will include barges, tankers, cargo ships, and portable tanks. The tentative title of these regulations is "Subchapter O—Rules and Regulations for Bulk Dangerous Cargoes."

William E. McConnaughey, a technical assistant in the Chemical Engineering Branch of the Coast Guard's Merchant Marine Technical Division, 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, and is Commanding Officer of a Naval Reserve Research Company.

The following principles are being used in developing Subchapter O:

(1) Only cargo carrying requirements will be included. General vessel construction and standard operating requirements already contained in other subchapters will not be repeated.

(2) Commodities will be listed by name and will not be classified by hazards.

(3) All commodities having significant hazardous properties other than flammability or combustibility (requiring oxygen and a source of ignition) will be included even though requirements may not differ from those due to flammability alone. When available, a hazard rating system will be used as a guide for determining which hazards are significant.

(4) Primary assistance will be obtained from the Chemical Transportation Advisory Panel, the NAS–USCG Advisory Group on Hazardous Materials and the NAS–NRC Advisory Center on toxicology.

(5) Requirements presently given in subchapters D, I, and N governing bulk transportation of commodities having significant hazardous properties other than flammability or combustibility will be deleted and incorporated in subchapter O.

(6) Commodities governed by subchapter D will all be chemically compatible and need not be identified in transportation other than by present flammability or combustibility classifications.

As presently envisioned, subchapter O will consist of four parts—general provisions, unmanned vessels, manned vessels, and portable tanks. Initial efforts will be confined to unmanned vessels (inland and seagoing barges) and the carriage of liquids and liquefied gases. Elements of containment and handling will be arranged in separate subparts to provide gradations of requirements based on potential hazards to operating personnel and the public. A chart will be used in each part to list requirements applicable to specific commodities. A table will be incorporated in both subchapter O and subchapter D listing all regulated bulk commodities that are permitted to be carried by water and specifying which subchapter is applicable.

One of the fundamentals of safety is understanding of hazards and that, in the face of changes underway and envisioned for bulk dangerous cargo transportation, we all face a challenging job in developing this understanding and in getting the right information in the right form in the right hands at the right time. Along with its statutory responsibilities for safety of lives and property on the water, the Coast Guard feels a duty to provide leadership and inspiration wherever possible and not to function merely as a police force. ⚓

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Excessive

Reprinted below is a most interesting article on the findings of a British court regarding the actions of a master who collided in a fog after "pressing on to save the afternoon's work." Reprinted by permission Merchant Navy Journal *of the Mercantile Marine Service Association, London.*

A formal investigation into the collision between M.V. *Gannet* and the German M.V. *Katharina Kolkmann* in fog in the Strait of Dover on March 29 found that it was caused in part by the wrongful act or default of the master of the *Gannet*. The court censured the master and ordered him to pay £250 towards the cost of the inquiry. It was stated that there would be no point in suspending or taking away his certificate as he had now retired from the sea.

Giving the findings of the court, Mr. J. Roland Adams, Q.C., the Wreck Commissioner, said that the maritime community must start thinking about other sanctions, possessing more bite than suspension of certificates, when masters and officers were found guilty of proceeding at excessive speed in fog.

M.V. *Gannet*, on a voyage from Oporto to London, encountered fog at about 0820 hours on March 28 and from then until the time of the collision at 0343 on March 29 the master was on the bridge in charge of navigation. He was doubtless rather tired, stated the court, but no more than is the common experience of shipmasters engaged in trade in much frequented waters. The ship was fitted with an automatic pilot, which was in use at the time. The master appeared to have remained "virtually glued to the radar screen."

Development of the collision was "tragically and specifically simple." The *Gannet* was proceeding along one of the most frequented shipping lanes in the world at her full speed of 11 knots. Her master was relying on the radar set at 6 miles range and identified another ship at a distance of about 6 miles. He watched the mutual approach of the ships until the meeting vessel was about half a mile away, having been broadening sufficiently to lead the master to think that the ships would pass each other with about half a mile of clear water between them.

"An important cause of this disastrous collision was excessive speed on the part of the *Gannet* and her master must be adjudged to have contributed to it by his wrongful acts or defaults in navigating his vessel at such a speed. Each new case of this kind, as they are distressingly frequent, tends to show that the fear of suspension is of no great deterrent effect."

Something must be done by the whole maritime community to make it clear that breaches of rule 16 of the Regulations for Preventing Collisions at Sea would not be tolerated, stated the court. There was no need to wait for a casualty before disciplinary action was taken. There were many ways in which shipowners could maintain a check on the practice of their masters.

"In the opinion of the court, owners in their own long-term interests, as well as in the interests of seafarers at large, ought to be encouraged by the board of trade to announce that mariners who proceed at immoderate speed in fog will be dismissed from the service of those owners.

"Mariners are only human and if they think they can 'get a good mark' by not losing a tide or 'saving the afternoon's work,' they will be encouraged to take risks however many 'Standing Orders' or 'Instructions to Masters and Officers' enjoin obedience to rule 16. Something more is needed."

Speed

The court continued: "Of course, commercial considerations must be given their due weight, but first things must be the paramount consideration of all who make their living by seafaring."

As the master of the *Gannet* by his recklessness had put the community to considerable expense in exposing his errors, so he should be made to contribute to the expenditure he had brought about, hence the order for payment of £250.

Referring to the advisability of stopping engines and navigating with caution when another ship was detected by radar in fog, the court stated that the law had been changed since this was suggested in the *Canopic* inquiry, but the importance of observing it should be brought to the notice of mariners, so as to correct the tendency of some to wait until they heard the whistle signals of another ship before stopping the engines.

During the hearing, counsel for the board of trade said: "Collisions in fog continue to occur and seem to show that experienced masters continue to disregard the elementary rules for preventing collisions at sea.

"They imperil the lives of their own crew, and the valuable ship placed under them. They also put in hazard valuable ships belonging to other owners.

"The board of trade is anxious that it should be widely appreciated that shipmasters who behave in this way also place in peril their certificates of competency and possibly their reputations."

The marine superintendent of the General Steam Navigation Co., Ltd., stated that the master had 37 years' continuous service with the company and had commanded ships for 25 years. He was one of the finest masters they had. He had now retired through ill health.

Masters in the company knew that they were not expected to navigate at speed in fog if this was dangerous even if this meant delay. He said that findings of several other inquiries of this nature had been made available to the masters.

Giving evidence the master said: "There is no doubt in my own mind that I was proceeding at speed in such weather. I was pressing on to save the afternoon's work." He stated that he had not been ordered to hurry and was free to advise the company by radio telephone that he would be late, and would not expect any disciplinary measures to result.

The wreck commissioner, referring to owners in general and the problem of high speed navigation in fog, said: "We have had enough of these cases now for the owners to have reached the position where they say to their masters—'It doesn't matter what the Board of Trade is going to do, it doesn't matter what the wreck commissioners are going to do, we are going to sack you if you do this.'"

Referring to rule 16, the commissioner added: "What you have got to do is to make these people more frightened of breaking rule 16 than anything else. More frightened of breaking the rule than of missing the tide, or missing a day's work."

Owners should make it clear that their masters would be sacked for disregarding the rules in respect of speed and fog. The court should make it clear that cancellations and not suspension of certificates would be the consequence in future.

The German ship sank after the collision and one of her crew was lost. The *Gannet* launched her lifeboat and a helicopter and lifeboat came from Dover. The remainder of the German crew were transferred to the *Gannet*.⚓

In Fog

Special Supplement

Motorboat Safety

Beached at Horseshoe Cove, near Sandy Hook, N.J., a 26-foot cabin cruiser lies gutted after a flash fire burned her to the waterline. In the background is the Sandy Hook Coast Guard Station.

Boating Accidents

THE COAST GUARD is charged by the Federal Boating Act of 1958 to collect, analyze, and publish statistics on boating accidents. This has been done annually in what has been known as "Recreational Boating in the United States—A Report on Accidents, Numbering and Related Activities." It is published as CG–357, dated 1 May of each year, and contains data from the previous calendar year as received up to 1 March. This year the report has taken on a completely new look. It is titled "Statistical Report on Recreational Boating 1965." In the statistical analysis section there are charts showing the trends in various categories over the past 5 years and an analysis of boating accident facts as revealed by the statistics. The statistical summary is changed to show in one place for the past year only all tabulated factors concerned with all types of accidents, in the next section all facts concerning fatal accidents, then all about personal injuries, and finally, data on property damage. This will facilitate studies using these data. Some of the broader findings found in this publication have been extracted and follow.

Analyzing Statistics

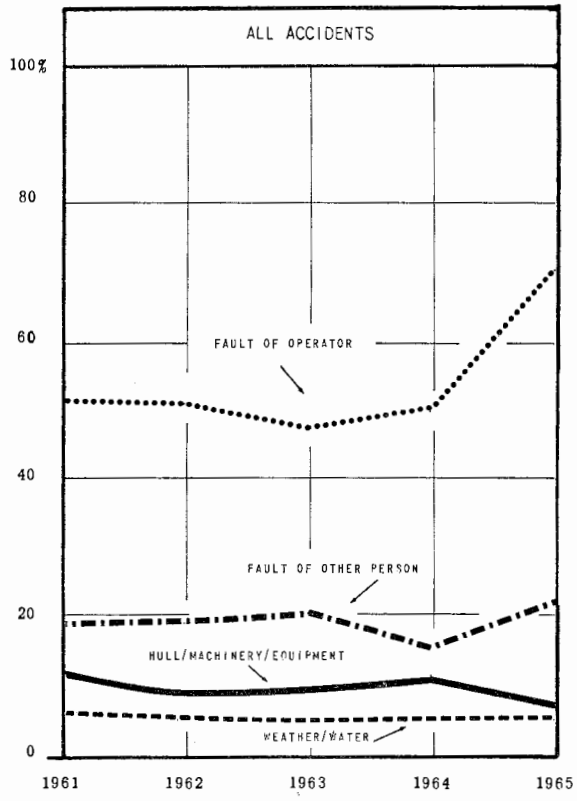
The primary factor which may lead analysts of boating accident statistics to false conclusions is the absence of a suitable base for comparison. Variables such as boat usage, which fluctuate with the national economy, length of boating season, weather patterns, and age of operator, to name a few, make comparisons by States, by experience, by types, by horsepower, by classes, and even by years subject to challenge. The success of safety equipment, training, education, design improvements and similar positive action programs is not directly measured by these statistics, for failure rather than successes are recorded. As a direct result of various safety programs, many "incidents" have not become reportable "accidents". For these and other reasons, caution is urged in arriving at conclusions based on these data.

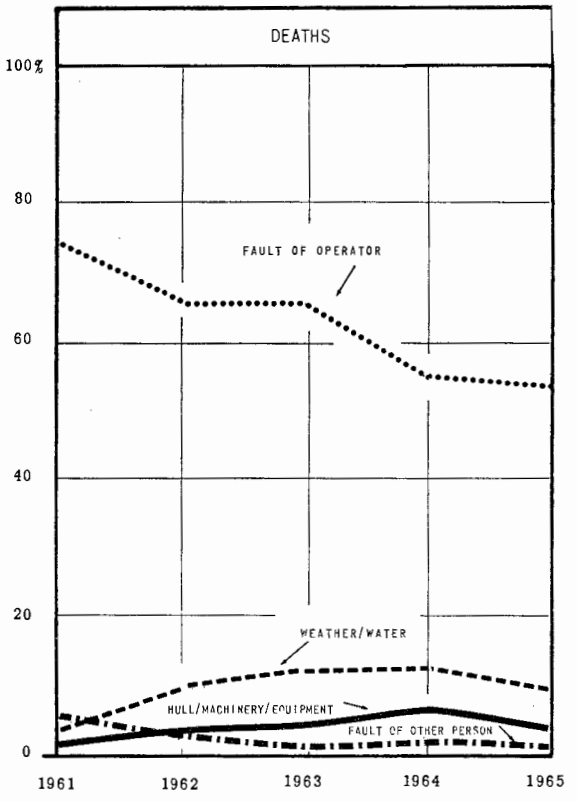
Most capsizings are attributed to the fault of the operator in his handling of the vessel. Lack of training and experience may lead him into waters which exceed the limits of his craft, lure him into unexpected currents, cause him to ignore weather warnings, or to exercise poor judgment in loading his boat. It is estimated that 50 percent of the persons in the United States cannot swim 50 feet. It becomes essential then, in all but most unusual cases, that victims of a capsizing should stick with their boat. For safety, all open boats should have positive buoyancy sufficient to support the passenger capacity when swamped. Life vests or preservers should be worn when boating conditions are hazardous, and by nonswimmers whenever out in open boats. A study of accidents where persons perished in the water showed that of the 1,360 persons who perished, 1,212 had no lifesaving devices on or within grasp. In the vast majority of cases, cushions, vests, or preservers were available in the boat. Capsizings alone account for nearly half of these cases.

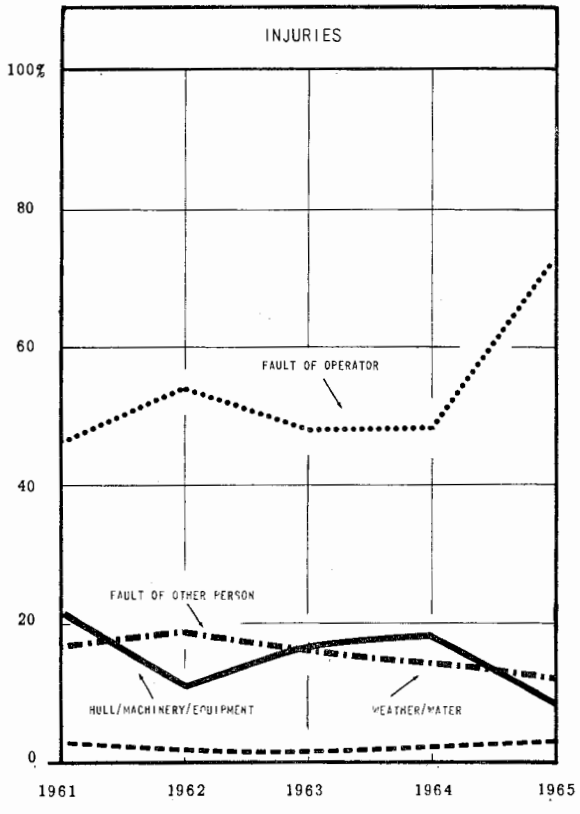
Explosions and Fires do most Property damage

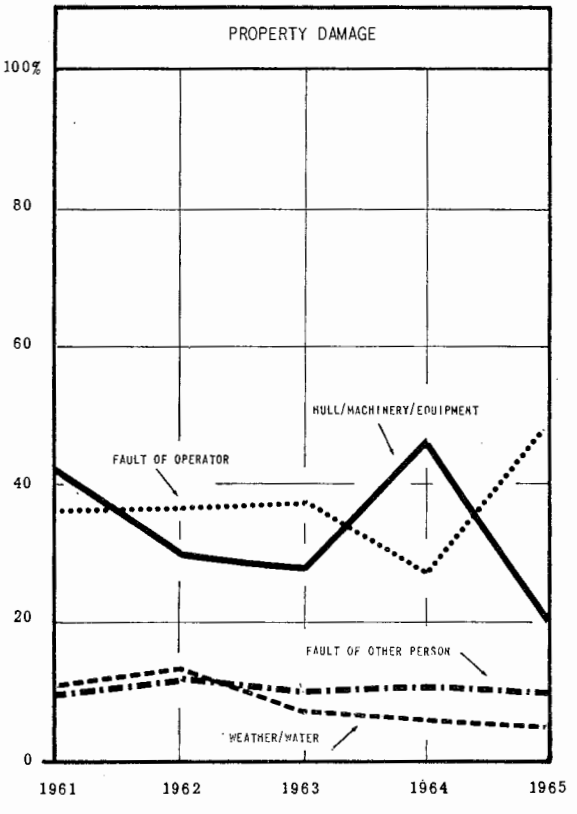
Revised Federal regulations calling for improved ventilation systems in most motorboats has resulted in a massive public safety education program focused on the hazards of volatile fuels in boats. Fires and explosions have led the list of causes of property damage throughout the years of this report. In personal injuries reported, fires and explosions rank second with a 50 percent increase since 1960. Third as the cause of all accidents reported, fires and explosions represent 9 percent of all causes, following collisions and capsizings. Improved ventilation systems are designed to reduce the hazards of volatile fuels in boats by introducing fresh air into fuel and engine compartments ducting dangerous heavier-than-air gases, if present, not only from the compartment but to the open atmosphere, hence out of the boat. Ventilation systems do not eliminate

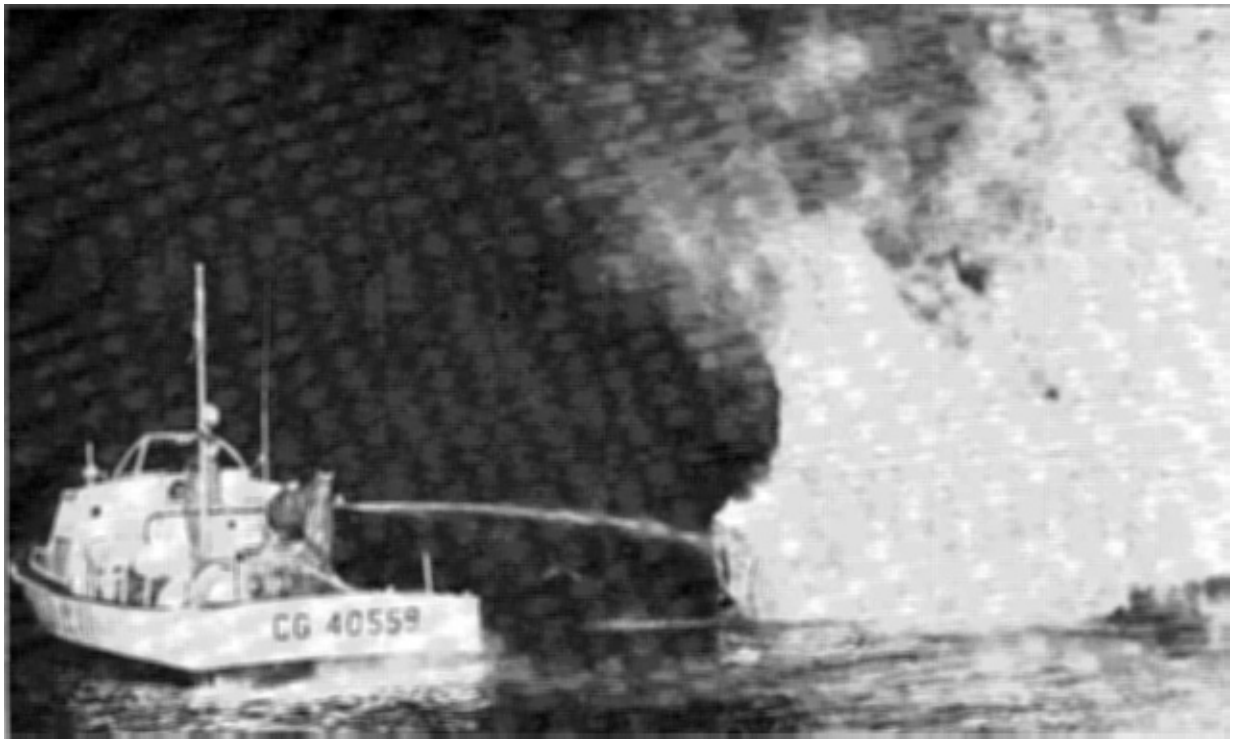
This 25-foot pleasure boat, victim of a gasoline explosion, burned and sank near Throggs Neck, Bronx, N.Y. on Sept. 27, 1965. The sole occupant was rescued by a passing pleasure craft.


ALL ACCIDENTS
100%
80
60
40
20
0
FAULT OF OPERATOR
FAULT OF OTHER PERSON
HULL/MACHINERY/EQUIPMENT
WEATHER/WATER
1961
1962
1963
1964
1965


DEATHS
100%
80
60
40
20
0
FAULT OF OPERATOR
WEATHER/WATER
HULL/MACHINERY/EQUIPMENT
FAULT OF OTHER PERSON
1961
1962
1963
1964
1965


INJURIES
100%
80
60
40
20
0
FAULT OF OPERATOR
FAULT OF OTHER PERSON
HULL/MACHINERY/EQUIPMENT
WEATHER/WATER
1961
1962
1963
1964
1965


PROPERTY DAMAGE
100%
80
60
40
20
0
HULL/MACHINERY/EQUIPMENT
FAULT OF OPERATOR
FAULT OF OTHER PERSON
WEATHER/WATER
1961
1962
1963
1964
1965



A Coast Guard utility boat fights small recreational boat fire near Milwaukee.

the source of the explosion hazard. Properly installed and maintained fuel systems are a basic requirement. Proper safety precautions in the handling of volatile fuels is essential.

Collisions cause Largest number Of injuries

Failure to keep a forward lookout stands out as the principal cause of collisions between vessels and with fixed objects. It is indeterminate how much failure to know or apply the rules of the road is involved. Also, there is no measure of the effectiveness of rear view mirrors or of observers in water-ski boats. It is clear, however, that training should stress the importance of the operator watching where he is going, of reducing speed in restricted and congested areas, of observing local traffic patterns, and of taking early and positive evasive action when a collision is likely. Nearly half of the vessels reported in accidents were involved in collisions. Over half were outboard powered motorboats less than 26 feet in length, but almost 90 percent of all motorboats fall in this category. Only about one-eighth of the vessels in collisions were towing skiers at the time, although others may have been maneuvering for a pickup.

Lifesaving Devices

Each year since 1961 the Coast Guard has closely analyzed *fatal* boating accidents specifically attempting to determine the degree to which lifesaving devices were used by victims and survivors of these accidents.

Only those persons who died or were placed "in peril" by being forced into the water in connection with a *fatal* accident have been considered in this analysis. No figures are available concerning the number of persons who, by their wise use of lifesaving devices, prevented a boating "mishap" from becoming a reportable boating accident.

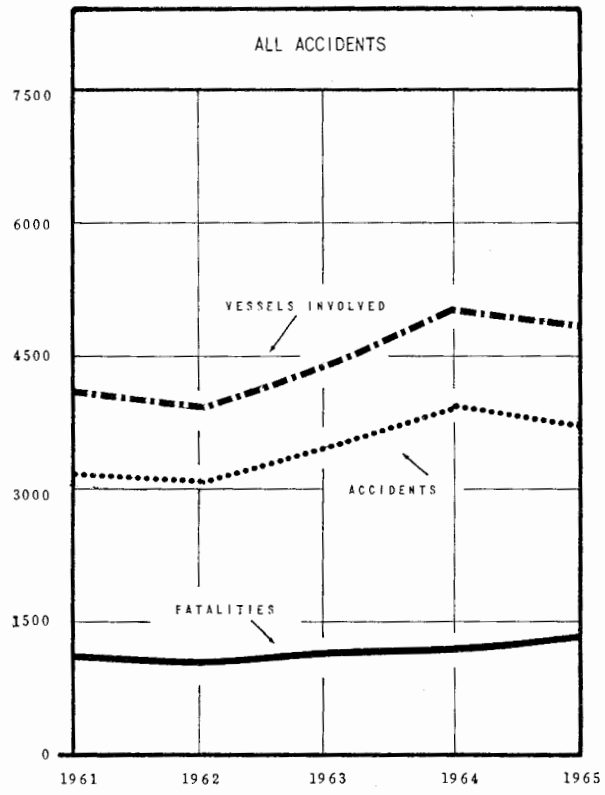
During 1965, 2,144 persons were placed "in peril" as a result of 1,076 reported fatal accidents. As a result of the accident, 1,360 of these 2,144 died. Eighty-nine percent, or 1,212 of the 1,360 who perished, did not have a lifesaving device on or within grasp (although in some cases they may have become separated from one). However, in 35 percent of those 1,212 cases there was no evidence of forewarning immediately prior to the accident which would have dictated the need for a lifesaving device.

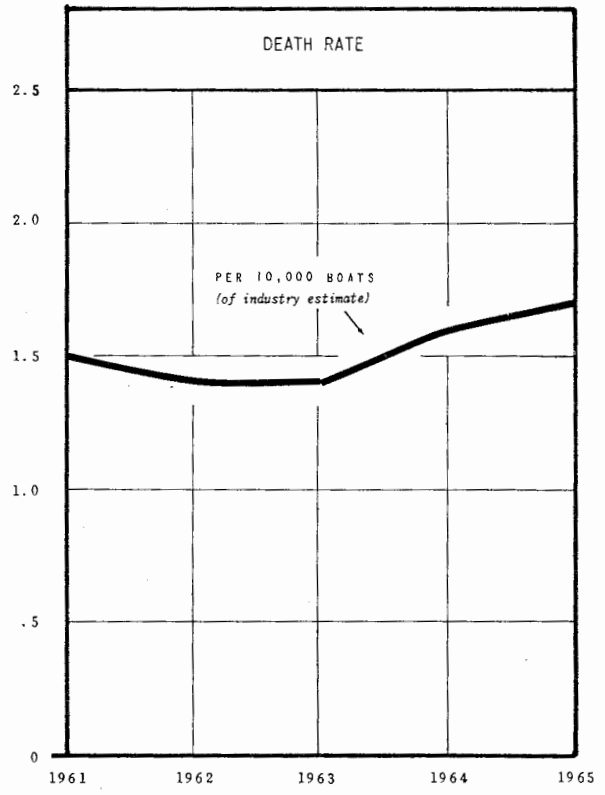
Over 63 percent of those individuals who *were* using a lifesaving device when they were placed in peril as a result of a fatal accident were rescued. Only 30 percent of those who were *not* using a lifesaving device were rescued.

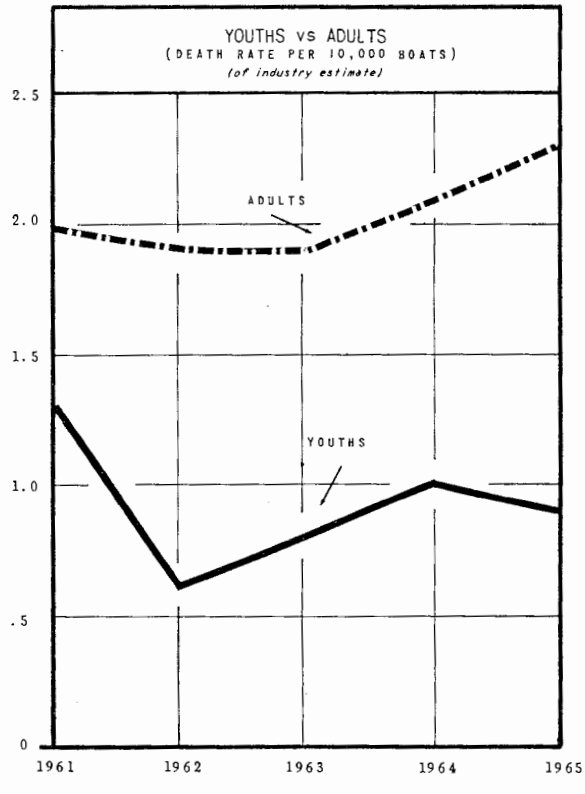
As might be expected, in the fatal accident cases reported, very few nonswimmers survived if they did not use a lifesaving device. Only 9 percent were rescued, whereas 50 percent of those nonswimmers who *did* have a lifesaving device were rescued. (In this connection, it is estimated that 50 percent of the people of the United States cannot swim 50 feet. The average age of fatal accident victims is 37 years. Male victims outnumber female victims better than 10 to 1.

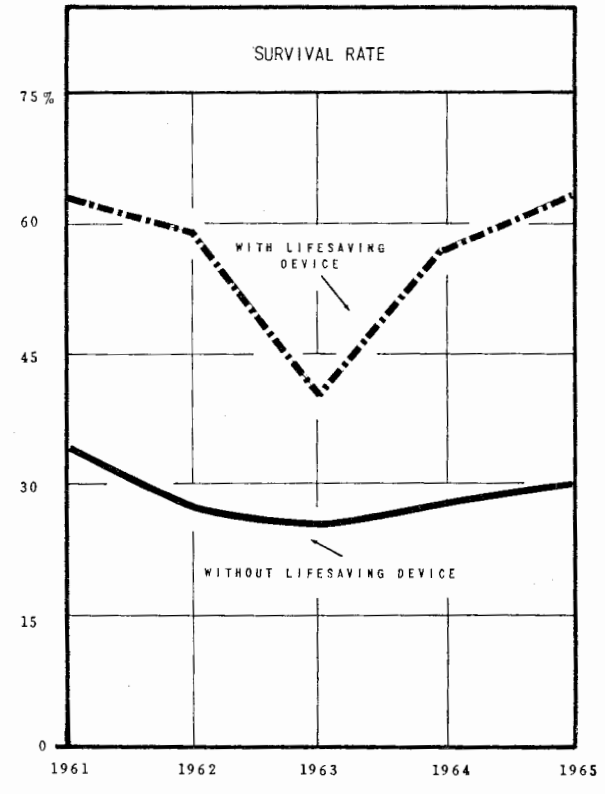
Boating safety programs are concerned with accidents on all waters involving all kinds of craft, but reporting requirements and safety controls vary with laws, rules, regulations and jurisdictions. For example, the Federal Boating Act of 1958 provides that ". . . vessels propelled by machinery of more than 10 horsepower . . . shall be numbered in accordance with this Act. . . ."

TRENDS
1961 - 1965









U.S. Coast Guard Auxiliary

Having met the safety requirements of an Auxiliary courtesy examination, a boat is awarded a courtesy examination decal.

A VOLUNTEER, nonmilitary organization, the Coast Guard Auxiliary was established by Congress to promote safety in recreational boating in the United States. Its 22,170 members, both men and women, are experienced boatmen, amateur radio operators, or licensed aircraft pilots. Auxiliarists' boats must be equipped and maintained to high standards of safety which far exceed the requirements of Federal law for recreational motorboats. In the operation of their craft Auxiliarists take pride in the fact that they are known for the promotion of safe boating by setting a good example.

To accomplish its purpose the Auxiliary carries out three basic programs: The Courtesy Motorboat Examination, Public Education, and Operations.

Courtesy Motorboat Examination. Specially trained and qualified members of the Auxiliary are authorized to conduct a courtesy examination of motorboats when requested by the owner or operator. This is a thorough safety check of the boat's equipment and general condition, covering both the requirements of the Federal law and certain additional standards for safety which have been adopted by the Auxiliary. Boats meeting these standards are awarded the respected Auxiliary C.M.E. decal. (Official Coast Guard boarding teams and most State officials will normally refrain from boarding a boat which displays a current decal.) If a boat does not pass the examination, the owner is advised of the deficiencies noted.

Public Education. The Auxiliary offers three separate courses in boating safety to the public: The one-lesson Outboard Handling course, the three-lesson Safe Boating course, and the eight-lesson Basic Seamanship course. The most complete course offered by the Auxiliary (Basic Seamanship) covers aids to navigation, rules of the road, marlinspike seamanship, motorboat handling, boating laws, charts and compass, and safe boating practices.

Operations. To assist the U.S. Coast Guard, members of the Auxiliary patrol regattas and marine parades and perform assistance missions for those in distress. These Auxiliary operations are often performed in conjunction with regular Coast Guard units.

Knot tying is one of the basic elements of seamanship taught by the Coast Guard Auxiliary.

A classroom session in seamanship conducted by an Auxiliarist.

National Safe Boating Week. In 1956 the Coast Guard Auxiliary organized and promoted the first nationwide observance of a "safe boating week." The U.S. Congress made this important occasion official by passing a joint resolution on June 4, 1958. Proclaimed annually by the President, the week serves to focus public attention on the need to know and observe safe boating rules and courtesies.

During National Safe Boating Week the Auxiliary intensifies its courtesy motorboat examination and educational programs. In many boating areas Auxiliarists set up examination stations, manning them throughout the course of the week. The one-lesson boating course also becomes a particularly useful boating safety tool at this time.

In the spring special Safe Boating Week kits are distributed to hundreds of local civic groups throughout the Nation. The posters, TV and radio spots, and other promotional materials contained in the kits help these safety-minded people toward a successful community observance.

Many national organizations cooperate each year on the National Safe Boating Week Committee.

Coast Guard Auxiliary achievement during calendar year 1965:

Nonmembers instructed in safe boating courses	163,552
Motorboats examined (courtesy examinations plus facility inspections	185,674
Nonmembers shown safe boating films	656,962
Cases of assistance rendered	6,877
Regattas patrolled	3,668
Lives saved	113

⚓

Ellsworth A. Weinberg
National Commodore
U.S. Coast Guard Auxiliary

A Coast Guard Auxiliary vessel from Miami rescued two men after this 35-foot fishing boat caught fire and exploded 1 mile northwest of Key Biscayne. A Coast Guard helicopter from Miami's Dinner Key Air Station maintained a constant watch on the rescue to insure the men's safety.

Coast Guard Safety Patrols

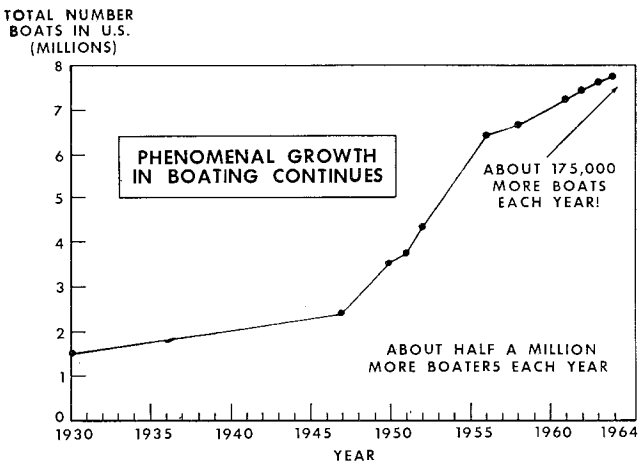
Captain D. W. Sinclair, USCG

Former Chief, Recreational Boating Division

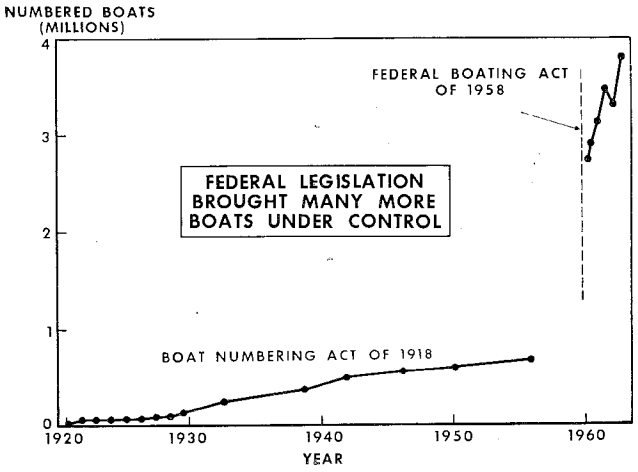
WHAT ARE COAST GUARD law enforcement teams doing on the inland waters of the United States?

By congressional direction the Coast Guard operates on "navigable waters of the United States," which come under Federal jurisdiction. And on these inland Federal waters, the Coast Guard has a responsibility which is shared by the States. Our purpose in visiting inland waters is to sample the boating situation, and to demonstrate to the States and local authorities what they can do with a minimum of equipment. We do not provide law enforcement or search and rescue services to one given area or body of water, but rather move about to cover as many places with boating concentrations as possible. To do so, we need a mobility greater than that afforded by waterborne transportation. To fill this need we operate 36 mobile boarding detachments. These are teams of three men, each equipped with a truck, trailer, and boat. Their primary mission is public education. This is carried out through public information programs that they conduct and through the law enforcement medium. Their secondary mission is that of search and rescue, a duty which they perform incidental to their regular duties, but which claims top priority when an incident occurs within their reach. These mobile boarding detachments are our specialists in motorboat law enforcement. They are the backbone of our boating safety program. But it must not be forgotten that our cutters, large and small, also participate in safety patrols. And in the specialized field of marine parades and regattas our ancillary organization of volunteer boatmen, the Coast Guard Auxiliary, devotes many hours in providing safety patrols.

Our best estimate is that there are about 175,000 more boats each year. This puts afloat approximately one-half *million* more boaters each year. Considering the replacement of those who retire from the boating fraternity, the number of new boaters is large indeed. Graph 1 indicates that the phenomenal growth of boating continues.



Graph 1



Graph 2

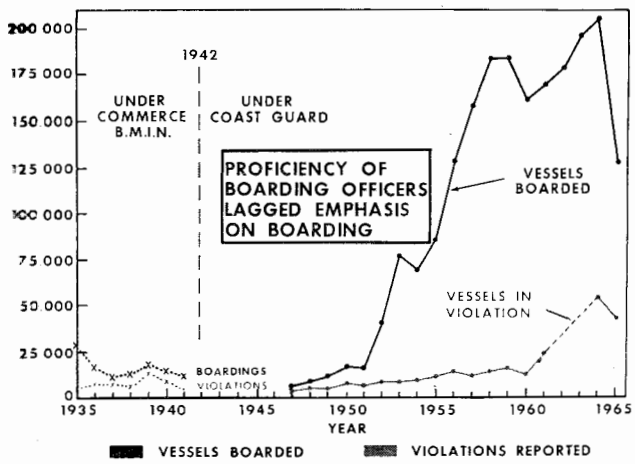
Recognizing that something had to be done to cope with this phenomenal boating growth, Congress acted to bring a greater number of boats under Federal regulation through the Federal Boating Act of 1958, which will be recalled replaced the old numbering act of 1918. Graph 2 shows there is little comparison between the control prior to and after that legislation.

The pattern of boardings for motorboat law enforcement purposes through the years, and the pattern of violations reported as a result of those boardings is shown in graph 3. You can see that the Coast Guard stepped up its program in pace with the postwar boating boom, but you can see, too, that only recently have our boarding officers been sufficiently well trained to recognize a violation when they see one. Both the institution of the safety patrol concept of more cruising and less boarding accounts for the dip in the curve between 1964 and 1965. There is, naturally, a dip also in the reports of violation, however, not in the same proportion. In fact, our experience shows an increase in the percentage found in violation, and it is very high, as you will soon see.

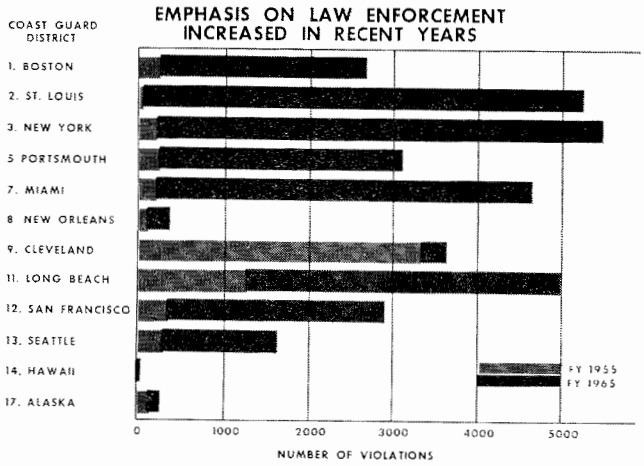
Although we boarded twice as many boats in 1965 as in 1955, you will see in graph 4 that the number of violations reported jumped more than tenfold. This reflects our experience and training in motorboat law enforcement and the institution of mobile boarding teams.

About the same time that we stepped up our motorboat law enforcement program, we developed through our Auxiliary a program wherein the boat owner voluntarily submits his boat to examination by a qualified member of the Auxiliary, who is also a boat owner. This is a free program with no strings or penalties attached. Steadily through the years it has increased in popularity and pulled along with it an everincreasing number of boats qualified for the coveted Coast Guard Auxiliary decal, a symbol of safety. Graph 5 shows this growth.

(continued on page 135)



Graph 3



Graph 4

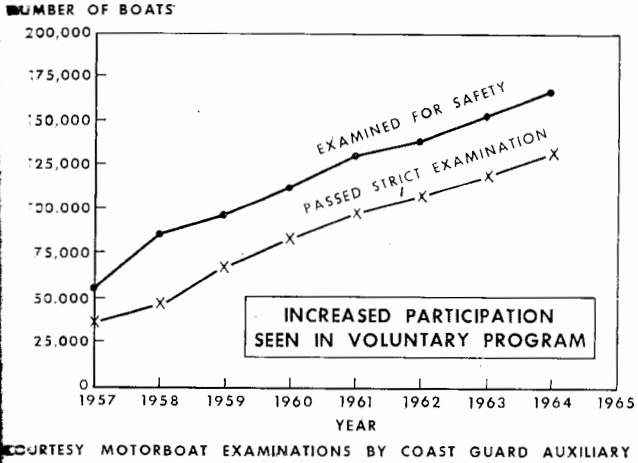
Earlier I mentioned that our safety patrol concept is basically one of boating safety education. An important feature, however, is the deterrent effect that our vessels have in being seen on the waters by the would-be imprudent operator. Not forgotten in our utilization of our mobile boarding teams is the good work they can do in the field of public information and education on the beach. Graph 6 shows the breakdown of our operational deployment as experienced last summer. Our units were on patrol 62 percent of their operational time, enroute between areas of operations roughly 24 percent of the time, and engaged in public information 14 percent of the time.

The exposure of our "seagoing cops" to the recreational boating fleet is shown on graph 7. Some 464,000 vessels were observed; and perhaps, in return, observed us. Out of this number, 11,500 were boarded; representing only 2.7 percent of those encountered. We used to be accused of harassment. And there was apparently some basis for that where we laid off the marinas and boarded boats as they were launched. We don't think that claim is generally true any more.

Let's take a closer look in graph 8 at the 2.7 percent that were boarded and see what we found. Fifty-eight percent of those vessels were in violation of Federal regulations. Only the smaller 42 percent passed examination. This is higher than previously experienced and probably stems from two factors: (1) The better training that we have given our boarding officers and (2) the fact that the boarding teams are singling out for boarding those vessels which are operating in an apparently unsafe manner.

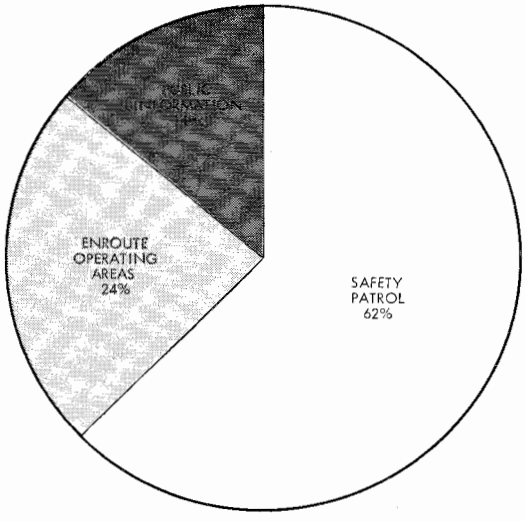
A further breakdown of the types of violations that compose this large segment of those boarded reveals that the most common cause is lack of or improper numbering and absence of registration certificates which are required to be aboard. The one in five violation of lifesaving devices regulations is alarming to us, because it represents a flagrant disregard for safety. Disturbing also, is the 14 percent in violation of fire extinguisher requirements and 10 percent

(continued on page 135)



Graph 5

OPERATIONAL DEPLOYMENT



COAST GUARD MOBILE BOARDING TEAMS SUMMER 1965

Graph 6

NATIONAL SAFE BOATING WEEK, 1966

By the President of the United States of America

A Proclamation

The family boating trip has now become almost as common in American life as the family picnic. It is a profound testimony to the strength of our American system and the scope of our prosperity that the recreation of boating, once the pastime of a privileged few, is now enjoyed by millions of families from all walks of life.

With the steadily increasing traffic on our waterways, however, it is vital that no efforts be spared to keep boating safe as well as stimulating. The knowledge and practice of safe boating principles can make hours spent upon the water measurably safer and more pleasurable.

Since 1958, when the Congress first requested the President to annually proclaim National Safe Boating Week, the rise in boating accidents has been largely checked. This record can be maintained—and improved—only if the Nation's boating organizations, Federal and State agencies, and the boating industry continue their efforts to inform the public of the importance of safe boating practices.

NOW, THEREFORE, I, LYNDON B. JOHNSON, PRESIDENT OF THE UNITED STATES OF AMERICA, do hereby designate the week beginning July 3, 1966 as National Safe Boating Week.

I urge every American who uses our waterways to reexamine his boating habits during this Week and decide what he can do, individually and together with his countrymen, to reduce accidents and prevent the needless waste of lives on the water.

I also invite the Governors of the States, the Commonwealth of Puerto Rico, and other areas subject to the jurisdiction of the United States of America to join in this observance and ask them to exert their influence in the cause of safe boating during this Week and throughout the entire year.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the United States of America to be affixed.

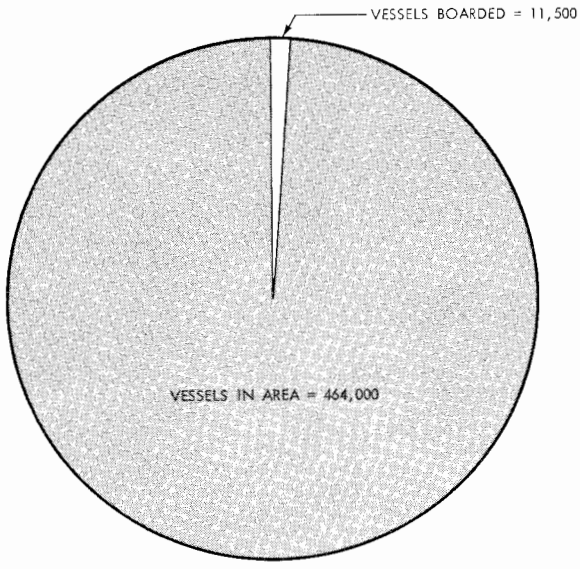
DONE at the city of Washington this 19th day of January in the year of our Lord nineteen hundred and sixty-six, and of the Independence of the United States of America the one hundred and ninetieth.

[SEAL]

LYNDON B. JOHNSON

By the President:
GEORGE W. BALL,
Acting Secretary of State.

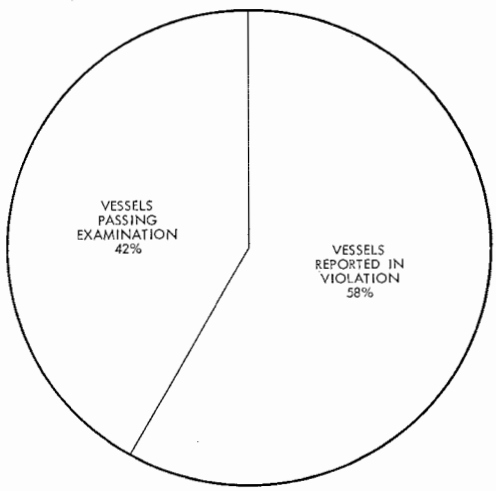
DETERRENT EFFECT



COAST GUARD MOBILE BOARDING TEAMS
SUMMER 1965

Graph 7

BOARDING RESULTS
FEDERAL EQUIPMENT REQUIREMENTS



COAST GUARD MOBILE BOARDING TEAMS
SUMMER 1965

Graph 8

nautical queries

Q. The speed of a boat is 10 miles per hour. The speed of the current is 2 miles per hour. If the boat proceeds upstream 5 miles and back to starting point, how long will be required to make the round trip?

(a) 1 hour 30 minutes.
(b) 2 hours.
(c) A little more than 1 hour.
(d) Considerably less than 1 hour.

A. (c) A little more than 1 hour.

Q. To obtain the most accurate fix by means of two objects plotted on a chart, you should always try to use objects that will give a cross bearing as close to 90° as possible.

(a) True.
(b) False.

A. (a) True.

Q. The markings on a chart such as C5, N6, S15, refer to:

(a) Ranges.
(b) Light ships.
(c) Beacons.
(d) Buoys.

A. (d) Buoys.

Q. The characteristic of a light on an aid to navigation that is used to mark the center of a channel would be indicated on a chart next to the buoy by which of the following?

(a) S—L.
(b) F.
(c) OCC.
(d) F. FL.

A. (a) S—L.

Q. A sea anchor is:

(a) An anchor used in deep water.
(b) An extra anchor carried aft.
(c) A device used to hold a boat end on to the sea.
(d) Two anchors on the same cable.

A. (c) A device used to hold a boat end on to the sea.

Q. Manila mooring lines in which the strands are right hand laid:

(a) Should be coiled down in a clockwise direction.
(b) Should be coiled down in a counterclockwise direction.
(c) May be coiled either clockwise or counterclockwise.
(d) Should never be coiled down.

A. (a) Should be coiled down in a clockwise direction.

Q. If the steering wheel of a boat underway is turned to the right:

(a) The bow will swing to the left.
(b) The stern will swing to the right.
(c) The stern will swing to the left.
(d) The bow and stern both swing to the right.

A. (c) The stern will swing to the left.

Q. At the call "man overboard" not knowing which side he fell over, you should:

(a) Immediately reverse the engines.
(b) First stop the propellers from turning and throw a ring buoy over the side.
(c) First increase speed to full to get the vessel away from the person.
(d) First put the rudder hard over either way.

A. (b) First stop the propellers from turning and throw a ring buoy over the side.

Q. Which of the following is a true statement concerning the stability of a vessel?

(a) Pumping out tanks low in the vessel will increase stability.
(b) Filling tanks low in the vessel will increase stability.
(c) Shifting low weights vertically to the main deck will increase stability.
(d) Once the stability of a vessel is established, it cannot be changed by shifting weights.

A. (b) Filling tanks low in the vessel will increase stability.

Q. Variation of the magnetic compass may be found by:

(a) Comparing your compass with another boat's compass.
(b) Referring to the compass rose on a chart of the locality you are in.
(c) Checking your compass on a range of known true bearing.
(d) Checking your compass with a bearing of the North Star (Polaris).

A. (b) Referring to the compass rose on a chart of the locality you are in.

Q. The bearing of a range taken from the inner circle of the compass rose was found to be 177°; the bearing of the range taken on the boat's compass was 175°. What was the deviation of the compass on that particular heading?

(a) 177°.
(b) 175°.
(c) 002° Westerly.
(d) 002° Easterly.

A. (d) 002° Easterly.

Q. If the magnetic heading is greater than the compass heading, the deviation is:

(a) East.
(b) West.
(c) North.
(d) South.

A. (a) East.

Q. The true course taken from the chart is 304°. The deviation on this heading is 6° East and the variation is 13° West. The compass course to steer is:

(a) 311°.
(b) 317°.
(c) 297°.
(d) 291°.

A. (a) 311°.

Q. A vessel is on heading 270° psc. For this heading, the deviation is 4° West. The variation is 12° East. The true heading is:

(a) 262°.
(b) 278°.
(c) 264°.
(d) 282°.

A. (b) 278°.

Q. Which one of the following is the least likely cause of a tide rip?

(a) Meeting of currents.
(b) Wind opposing a current.
(c) Current over an uneven bottom.
(d) Wind and current from same direction.

A. (d) Wind and current from same direction.

Q. General weather and current information for the Atlantic, Gulf and Pacific coasts of the United States are found in the:

(a) Light list.
(b) U.S. Coast Pilot.
(c) Nautical Almanac.
(d) Notice to Mariners.

A. (b) U.S. Coast Pilot.

Q. Fog at sea is usually caused by warm air blowing over a colder sea surface and being cooled below its dew point.
(a) True.
(b) False.
A. (a) True.

Q. If the sky was clear with the exception of a few high, white, cotton-like clouds called "cumulus clouds," it would indicate:
(a) Rain.
(b) Hurricane weather.
(c) Fair weather.
(d) Fog setting in.
A. (c) Fair weather.

Q. Slack water is said to occur when there is:
(a) No horizontal motion of the water.
(b) No vertical motion of the water.
(c) A weak ebb or flood current.
(d) Neither a vertical nor a horizontal motion.
A. (a) No horizontal motion of the water.

Q. Day beacons are unlighted fixed aids to navigation placed on shore or marine sites. They are identified by their:
(a) Color and structure.
(b) Color.
(c) Structure.
(d) Signal characteristics.
A. (a) Color and structure.

Q. If you were operating your small passenger vessel on the Great Lakes and required charts for the area, you would obtain them from:
(a) The U.S. Naval Oceanographic Distribution Office.
(b) The Coast and Geodetic Survey of the Department of Commerce.
(c) The U.S. Army Corps of Engineers.
(d) The Canadian–British Admiralty Charts LTD.
A. (c) The U.S. Army Corps of Engineers.

Q. Prior to getting underway, a prudent boat operator inspects his boat to insure his equipment is in good operating condition and that he has up-to-date:
(a) Calendar aboard.
(b) Chart of the area aboard.
(c) Nautical supply catalogue aboard.
(d) Weather map of the area aboard.
A. (b) Chart of the area aboard.

Q. You are proceeding in a strange channel that is not buoyed, and you see surface ripples and discolored water ahead on your course; the ripples and water would most likely indicate:
(a) A tide rip.
(b) A reef, obstruction, or shoal spot.
(c) A reversing current.
(d) Both (a) and (b) of the above.
A. (b) A reef, obstruction, or shoal spot.

Q. When anchoring your small passenger vessel, you should head the vessel downwind with sea or current.
(a) True.
(b) False.
A. (b) False.

Q. A red and black horizontally banded buoy with the top band painted black would have a _____ light.
(a) Green.
(b) Red.
(c) Green or white.
(d) Red or white.
A. (c) Green or white.

Q. White and black horizontally banded buoys mark:
(a) Midchannel.
(b) Anchorage areas.
(c) Surveying areas.
(d) Fish net areas.
A. (d) Fish net areas.

Q. Buoys marking a quarantine anchorage are colored:
(a) Yellow and red.
(b) Yellow.
(c) Yellow and black.
(d) Yellow and white.
A. (b) Yellow.

Q. Black and white vertically striped buoys mark the fairway or midchannel and should be passed:
(a) Close to, on either side.
(b) At a distance, on either side.
(c) Close to starboard, at a distance to port.
(d) Close to port, at a distance to starboard.
A. (a) Close to, on either side.

Q. Which of the following marks an obstruction?
(a) A yellow buoy.
(b) A red buoy.
(c) A buoy with black and white vertical stripes.
(d) A buoy with red and black horizontal stripes.
A. (d) A buoy with red and black horizontal stripes.

Q. On a chart the characteristic of the light on a light house is shown as flashing white with a red sector. The red sector:
(a) Indicates the limits of the navigable channel.
(b) Indicates a danger area.
(c) Is used to identify the characteristics of the light.
(d) Serves no significant purpose.
A. (b) Indicates a danger area.

BUOYANT LIFESAVING DEVICES

What is in a name? In the world of lifesaving equipment, apparently quite a great deal. Why "life preserver," "life jacket," "buoyant vest," "buoyant cushion"? What difference does it make? In an attempt to dispel some of the confusion arising in this area, we carry below answers to some questions often asked Coast Guardsmen.

Information on Buoyant Lifesaving Devices

1. Q. Why does the Coast Guard say "lifesaving device" instead of "life jacket?"

A. The motorboat equipment requirements permit the use of devices designed to be grabbed as well as worn, e.g., the buoyant cushion and ring life buoy.

2. Q. Well, then, speaking only of those worn, why not just say "life jacket"?

A. Ships, passenger carrying vessels, and class 3 motorboats must have a "life preserver" for each person on board to meet the equipment requirements, but classes A, 1, and 2 boats may have "buoyant vests" or "special purpose water safety buoyant devices."

3. Q. What's the difference?

A. "Life preservers" have about 22–25 lbs. buoyancy, while "buoyant vests" and "special purpose devices" run around 16–20 lbs., usually.

4. Q. Is it true one can tell a "preserver" by its jacket-like shape and that "vests" are of the horse collar or bib type?

A. No. "Preservers" can be of either style. They are always orange now. "Vests" are only of the horse collar or bib type (except for racing vests). They are usually, but not always, orange. The only way to be sure is to read the label.

5. Q. What are the "special purpose devices"?

A. These are a new category to permit buoyant devices more practical in design for wearing while engaged in specific water-borne activities such as water ski competition, speedboat racing, white water canoeing and duck hunting. The Coast Guard doesn't "approve" them by conducting tests and factory inspections ourselves, but by approving the design criteria and permitting the Yacht Safety Bureau testing laboratory to certify them. There are only a few on the market to date.

6. Q. Why doesn't the Coast Guard accept the mae west type vest?

A. All inflatable devices are subject to puncture and leaks. They require periodic servicing, and usually training for proper use. These reasons make them unsuitable for general public use.

7. Q. If the standard Navy life preserver is good enough for the serviceman, why isn't it acceptable?

A. Its performance is superior to all but two of the Coast Guard approved life preservers, but it is not acceptable for general public use because (1) it has up to seven straps to be tied as compared to no more than three on approved devices, (2) adjustments are almost impossible to make after entering the water, (3) they are not reversible, (4) training is needed to don them properly, and (5) those available for public purchase have usually been rejected or surveyed for some defect over which we have no control.

8. Q. Why don't Coast Guard personnel wear the type jackets they approve for the boating public?

A. Coast Guardsmen sometimes do. The Coast Guard uses a number of different devices for different purposes: The Navy type and one type of Coast Guard approved life preservers are issued for general shipboard use. The Coast Guard approved work vests may be used on buoy tenders and other over-the-side duties. Coast Guard approved buoyant vests are used by boarding teams.

9. Q. Why doesn't the Coast Guard approve only the best design and eliminate all the confusion?

A. There are many factors that make one device "better" than another. Performance is the most important. That means holding an unconscious body upright in the water, reclined slightly backward so that the face is turned upward, with sufficient freeboard to the nostrils so the person won't drown. The quicker the righting, the firmer the position is held, and the greater the freeboard, the better the performance—*and the bulkier the jacket.* Here is where the compromise comes in. If too bulky it won't be worn. If too costly it won't be purchased. It must not require any training, so that it can be donned in the water even under the stress of an emergency.

10. Q. When is the Coast Guard going to approve of ski belts? Granted they are not as good as a vest, but they're better than nothing, aren't they?

A. The Coast Guard will never approve them because they float an unconscious person with his face in the water. They may, or may not be an aid to survival depending on the nature of the casualty. They may give false security, discourage the use of a vest, and actually aggravate the situation by exerting an inverting moment.

11. Q. Well, I don't care what the Coast Guard says. I'm going to wear what I want to. What do you say to that?

A. There is no Federal law that says you can't wear unapproved buoyant devices; however, unless they are on board in excess of the required approved equipment, you'll be in violation of Federal regulations. But, don't forget to check the State regulations too.

12. Q. What does the Coast Guard approval guarantee?

A. It assures you that reasonably good quality materials were used. On "preservers" and "vests" it indicates that it should right an unconscious person and hold him head up with his face out of water under calm water conditions.

13. Q. Then "preservers" and "vests" are just aids to swimming?

A. They're much more than that, but they cannot work miracles. Perhaps these statistics will convince you of their value: Of 1,057 who perished by drowning in boating accidents during 1964, 1,034 had no lifesaving devices.

14. Q. There is certainly more to this subject than I realized. I thought all a boarding officer had to do was say, "Hey, Skipper, how many life jackets you got?"

A. Being a boarding officer requires a technical knowledge of many things besides life jackets, OOPS, I mean besides life preservers, buoyant vests, ring life buoys, buoyant cushions and special purpose water safety buoyant devices.

Patrols (continued)

of ventilation system requirements. However, there is some mitigation for these two categories, since the regulations have been recently clarified and perhaps made more stringent. An interesting fact shows up in statistics of reckless and negligent operation being so very small: Three-tenths of 1 percent. This is a definite downward trend from our previous experience and leads us to wonder why. Reports from our district offices support our belief that this is a measure of the deterrent effect of our new safety patrol concept. That the very presence of our law enforcement teams is bringing order where there was chaos and quieting down the cowboys who think our recreational waters are open range. ⚓

STORES AND SUPPLIES

Articles of ships' stores and supplies certificated from April 1 to April 30, 1966, 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

Metropolitan Petroleum Petrochemicals Co., Inc., Foot of Caven Point Rd., Jersey City, N.J., 07304, Certificate No. 649, dated April 1, 1966, MET–INDUSTRIAL 456; Certificate No. 650, dated April 1, 1966, MET–INDUSTRIAL 456SV; Certificate No. 651, dated April 1, 1966, METLITE; Certificate No. 652, dated April 1, 1966, PERMA–CLEAN; Certificate No. 653, dated April 1, 1966, METLITE 2D; Certificate No. 654, dated April 1, 1966, METCLENE.

Apollo Chemical Corp., 250 Delawanna Ave., Clifton, N.J., 07014, Certificate No. 660, dated April 14, 1966, RSI–6; Certificate No. 661, dated April 14, 1966, DSD–2 and DC–22; Certificate No. 662, dated April 14, 1966, SSI–3; Certificate No. 663, dated April 14, 1966, VCI–4.

Lubaid Co., Milwaukee 1, Wis., Certificate No. 659, dated April 13, 1966, LUBAID D and LIQUID SOOT-OUT.

Certified Laboratories, P.O. Box 2493, Fort Worth, Tex., 76101, Certificate No. 664, dated April 14, 1966, SAF-SOL READY TO USE SOLVENT DEGREASER.

Olympic Mfg. Co., 670 Trabert Ave. NW., Atlanta, Ga., Certificate No. 655, dated April 12, 1966, KLEENAWAY.

Bergen Oil Co., Back Bay, P.O. Box 371, Boston, Mass., 02117, Certificate No. 656, dated April 12, 1966, BERGEN DEGREASER 100.

Penetone Chemical Div. Amerace Corp., Tenafly, N.J., 07670, Certificate No. 657, dated April 13, 1966, PENETONE 66.

Power Dynamics Corp., P.O. Box 145, Boston, Mass., 02101, Certificate No. 658, dated April 13, 1966, DYNASOL and SE–74.

CANCELLED

Purex Corp. Ltd., 5101 Clark Ave., Lakewood, Calif., 90712, Certificate No. 451, dated May 3, 1962, PUREX SPECIAL ANTI-SLIP FLOOR WAX; Certificate No. 452, dated May 3, 1962, PUREX BRYTENE NON-SCUFF POLYMER FLOOR POLISH.

Corrosion Reaction Consultants, Inc., Limelin Pike, Dresher, Pa., 19025, Certificate No. 395, dated July 21, 1959, RACO CORROSION INHIBITOR.

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