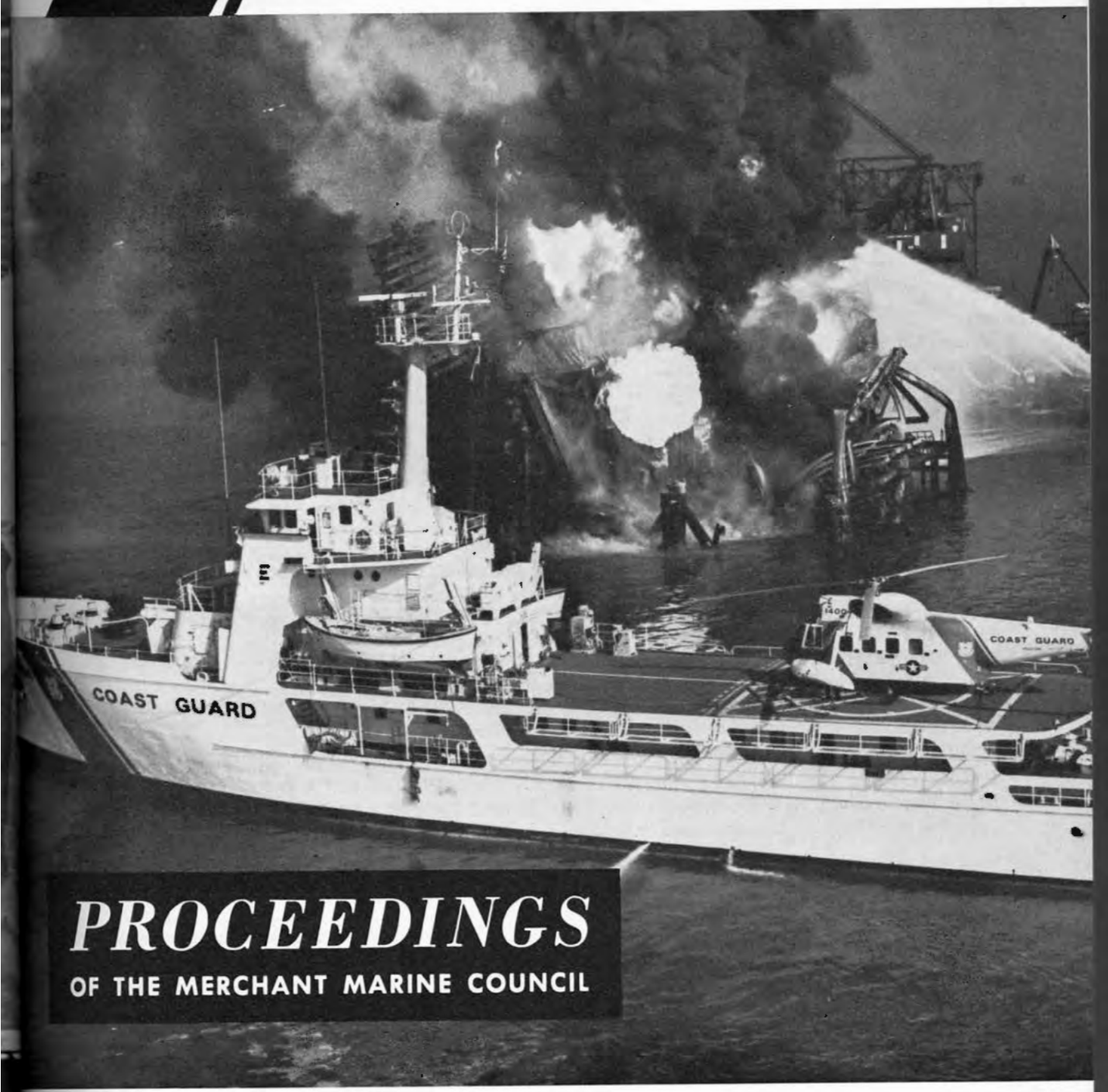
COAST GUARD



PROCEEDINGS

OF THE MERCHANT MARINE COUNCIL

Vol. 28, No. 3 CG–129 March 1971

IN THIS ISSUE . . .

Water Pollution By Marine Transportation Prevention . . . Cleanup . . .

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CONTENTS

COVERS

FRONT COVER: The Coast Guard Cutter Dependable stands by the burning Shell platform 26 B located 60 miles south of New Orleans. The spray barge in the upper right corner, owned by J. Ray McDermott and Co., Inc. of New Orleans, is attempting to cool the flaming structure prior to capping the well. The fire, which broke out on December 1, 1970, took the lives of four of the 60 persons aboard the platform. The Dependable, and the Coast Guard HH 52A helicopter pictured on her flight deck, acted as on scene observers, monitoring extinguishment operations and any resultant pollution. *Photo by Louis E. Darre, Jr. Shell Oil Co.*

BACK COVER: The diesel fuel trailing behind this tugboat which sank in the Passaic River, New Jersey leaves a conspicuous reminder of the pollution caused by such a marine casualty.

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PROCEEDINGS

OF THE

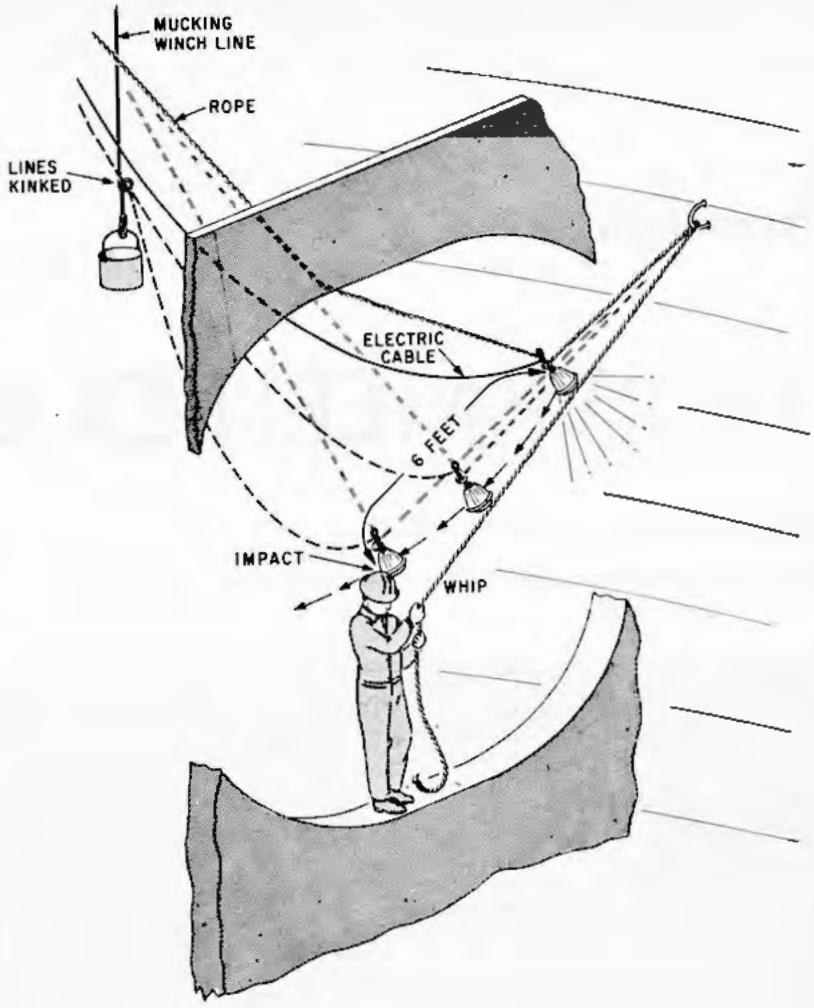
MERCHANT MARINE COUNCIL

Published monthly at Coast Guard Headquarters, Washington, D.C. 20591, under the auspices of the Merchant Marine Council, in the interest of safety at sea. Special permission for republication, either in whole or in part, with the exception of copyrighted articles or pictures, is not required provided credit is given to the Proceedings of the Merchant Marine Council. Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 21, 1969.

ACCIDENT REVIEW

A CTC ship reported this unusual accident that happened during tank mucking operations. The bos'n was struck heavily on the head by a free-swinging, tank-cleaning light. A sediment bucket hauling line became fouled in the electric cable of the tank light and the bos'n was attempting to clear it. He climbed on a web frame and untied the whip line snubbing the light to the skin of the ship. The greasy line slipped through his gloved hands and the light swung pendulum fashion and struck squarely against his safety hat. The bos'n was stunned momentarily but managed to keep his feet.

The safety hat cracked under the impact (see photo) but it absorbed the force of the swinging lamp. The safety hat protected the bos'n from a serious head injury and possibly fatal fall to the tank bottom.



COMMENT

A very good report from the ship—comprehensive and detailed. This was a "Stewart-Browne" USCG approved explosion-proof tank-cleaning light weighing approximately 16 pounds. On a free-swinging 6-foot arc, this weight can deliver a fatal blow to an unprotected head. This is another good example as to why the regulation that requires safety hats to be worn during tank cleaning should be followed without exception. ⚓

—Safety Bulletin, Chevron Shipping Co.

Prevention

WATER POLLUTION BY

Commander Albert G. Stirling, USCG

Chief, Electrical Engineering Division, Office of Merchant Marine Safety, Headquarters

THE STERN SECTION of the SS *Ocean Eagle* remains afloat after the vessel's grounding off the Puerto Rican coast on March 3, 1968. Spillage of the cargo caused extensive pollution to the harbor and adjacent beaches near San Juan.

From an address before the 1970 Marine Section, of the National Safety Congress and Exposition.

ALTHOUGH "ecology," "antipollution" and the "environment" are in vogue today, they do not change the basic fact that safety and antipollution measures are inseparable. Programs designed to prevent pollution and protect the environment are only an extension of what we desire to keep "safe." Containment of petroleum products or chemicals is the primary goal whether the fear is of escape and fire or escape and pollution. Thus the Coast Guard, charged with the responsibility for maritime safety, has been and will continue to be a pollution control agency. The ecological concern of this country will only modify the current emphasis of the Coast Guard's safety program.

When placed in this safety perspective, the problem of water pollution has a more effective solution. The Coast Guard realizes, in exercising its safety functions, that some degree of risk and some lack of safety in everyday work, must be accepted. The task is to minimize this risk to the greatest extent practicable. In approaching water pollution, the same limitations must be employed. The First Report of the President's Panel on Oil Spills, cautioned that "Alternatives available to lessen the frequency and magnitude of oil spills do not include the complete abandonment of oil tankers or the total elimination of offshore oil operations."

Presuming that marine transport of possible pollutants will continue to expand, what safety strategies can be used? Five possibilities are now apparent:

(1) Provide a containment system which is unlikely to be breeched.

(*Continued on page 46*)

Cleanup

MARINE TRANSPORTATION

Commander Daniel B. Charter, Jr. USCG

Chief, Maritime Pollution Control Branch, Office of Operations, Law Enforcement Division, Headquarters

DESPITE the best preventive efforts, it is estimated that in U.S. waters there may be as many as 10,000 polluting spills a year—10 of which are major spills. In addition, one spill of disastrous proportions can be expected on the average of every 10 years. About half of these are oil spills, some three-quarters of which are estimated to be transportation-related. While many of these spills are relatively small, they are frequent and add up to produce an unacceptable level of pollution in our ports and waterways.

Thus, in addition to our preventive program, there must be a cure for the polluting spills that do occur. The damages that these spills can cause to human health, natural beauty, wildlife, fisheries resources, recreational areas, private and public property, and other aspects of the marine environment must be limited. To control such damages, quick action must be taken to confine the polluting substance to a small area and then to remove or somehow inactivate it.

First of all, effective response to pollution incidents requires careful advance planning. When a spill occurs, responsible officials must be ready to act immediately and decisively. The Federal Government has been active in pollution contingency planning during the last few years. In anticipation of enactment of the Water Quality Improvement Act of 1970 and in response to a presidential memorandum of June 1968, the Departments of Transportation, Interior, Defense, and Health, Education, and Welfare and the Office of Emergency Preparedness signed an interagency agreement known as the National Multi-agency Oil and Hazardous Materials Pollution Contingency Plan. This agreement provided for a coordinated Federal

(*Continued on page 49*)

STRAW WAS USED extensively after the 1969 Santa Barbara spill to absorb oil which had drifted to shore.

PREVENTION

(*Continued from page 44*)

(2) Eliminate all hazards to the containment system which have sufficient potential to breech it.

(3) Limit the quantity of pollutant lost in the event of containment failure.

(4) Limit the rate of loss of pollutant in the event of containment failure.

(5) Provide a system external to the carrier to contain and clean up any spill.

The above strategies, as written, are concerned with the product as stored aboard the transport. However, they must be modified and applied to the possible discharge of a pollutant as a result of product handling and transfer and routine vessel maintenance and operating procedures. These strategies, their substrategies, and the various combinations thereof must be evaluated through some method or system to determine their impact and effectiveness on the pollution problem. Before moving on to a discussion of the strategies, some consideration should be given to the fifth strategy, that of cleanup after a spill which is covered elsewhere in the Proceedings.

A cleanup capability will always be a necessity. As long as people are involved in marine transport there will be spills. However, spill cleanup is attacking a symptom and not the cause. It is unfortunate that the research and development efforts in this field are so hardware oriented. More significant progress would be made if much of the efforts and funds of both Government and industry were directed to prevent pollution rather than cleaning it up or developing better solvents and emulsifiers. This latter approach is akin to spending money on cemeteries rather than medical research because there will be some tangible evidence of where the money went.

While on the subject of people and spills, it is clear that any accident prevention program—and spills are a form of accident—must be a positive one based upon the knowledge that man is fallible. In every "human error" accident there is a chain of events leading to the final act by a human. If any event in the sequence is eliminated, the accident does not occur in spite of the human failure. A foolproof system must be the design philosophy, for with the right set of events preceding an accident, anyone can be "the fool." With these criteria in mind, the proposed strategies can be considered in more detail.

PROVIDE A CONTAINMENT SYSTEM WHICH IS NOT LIKELY TO BE BREECHED

The mere statement of this strategy concedes compromise is necessary. Current technology will not permit containment within reasonable bounds when two 300,000-ton tankers collide at 16 knots or break their backs upon the rocks. A total containment concept was used for the nuclear reactor on the *Savannah;* however, that design required that a much smaller package be contained.

A damage criterion is being developed by the Ship Design and Equipment Subcommittee of the Marine Safety Committee (MSC) of the Intergovernmental Maritime Consultative Organization (IMCO). This type of work must be done on an international basis since U.S. waters are exposed to vessels of all nations. This criterion appears reasonable and only time will answer the question of its adequacy.

A joint effort of the Coast Guard and the chemical transportation industry to develop marine transportation standards for hazardous materials has resulted in a new Subchapter O of Title 46, Code of Federal Regulations. That section concerning unmanned barges has been published and that portion concerning manned vessels is soon to be published.

In these regulations are three types of hull design with varying degrees of damage resistance, Type I vessels being most damage resistant and Type III vessels the least. The Type I and II vessels require a double hull or independent tank such that the inner tank is a specified distance inboard of the outer hull. Although the distances presently specified approximate the tentative international standards for extent of damage, they do not in all cases meet the new international criteria. Once the international standard is in final form then U.S. standards will be brought into line.

The present and proposed regulations then have in some way related hazard to degree of containment. To date only the very toxic (to humans, or fish) and the very reactive have been assigned double hull type protection. We are faced with a decision on acceptable risk. Past decisions placed a higher risk on the ecology than present day consideration might. Typical of this are petroleum products which are carried in single skin barges and ships. This risk apparently has never been justified. A comprehensive study has not been done on the life cycle cost of using double hull construction rather than single hull construction. Unconfirmed reports received about one oil company, which built some large tankers with double bottom construction, are that many unexpected benefits occurred. With a flush bottom tank and a well type suction, tank cleaning was greatly reduced and lost capacity due to sludge and residual cargo was eliminated. One adverse and unexpected result was a complaint to the producer from the refinery on the poor quality of the crude oil because of the increased sand and dirt content.

A major side benefit of double hull construction is that it provides for clean ballast tanks and the elimination of the major contribution of slop oil and dirty ballast to water pollution. Although there are other

alternatives to a better container, double hull construction is the only one receiving much attention at this time.

ELIMINATE ALL HAZARDS TO THE CONTAINMENT SYSTEM WHICH HAVE SUFFICIENT POTENTIAL TO BREECH IT

This strategy is, of course, the opposite of the first. In this strategy a proposal is made to eliminate any possibility of collision, stranding, impact, weather damage, falling space ships, overpressurizing or overfilling, fire, dynamic loading, or fatigue. Again faced with lack of perfection, damage to the system cannot totally be eliminated, but the probability that a damaging incident will occur can be reduced. Better navigation systems, better aids to navigation, better vessel routing considering weather, channels, and traffic, better cargo handling, overflow and pressure relief systems, and better training to the operating personnel can all be provided. One interesting thought under this strategy is that there should be a few large vessels rather than many small ones and thereby the probability of an accident would be reduced.

LIMIT THE QUANTITY OF POLLUTANT LOST IN THE EVENT OF CONTAINMENT FAILURE

This strategy dictates many small vessels, many small tanks, available empty tanks or collapsible containers such that cargo from a leaking tank can be rapidly transferred, and one far out idea is cargo solidification. IMCO has the problem of tank size under consideration in conjunction with the expected damage criteria. In relation to cargo handling, this strategy requires smaller loading hoses, lower transfer rates and rapid response to the handling system to various conditions such as overfilling or line rupture.

LIMIT THE RATE OF POLLUTANT LOSS

In regard to vessels, this may be difficult to achieve. Two possible approaches would be a self-sealant type tank for small ruptures and a cargo coagulation process for larger ruptures. In regard to cargo handling, this is very similar to the previous strategy of lower handling rates and small interconnections.

It should be apparent and not at all surprising from the above discussion that no one strategy can be used to its fullest; rather they will all be used to some extent. How can the pollution hazard be assessed and a decision made on which strategy should be employed and the degree to which it should be used? To answer this, the complete pollution problem must be reviewed as outlined in Figure 1:

This procedure is to evaluate the intrinsic product hazard; consider the technology available to control the product prior to and after release; considering the quantities involved, assign an acceptable degree of risk which specifies the required preventive program; this in turn results in spills from which an experience factor for reevaluation is established. No analytical or scientific method has been developed yet to achieve this goal.

The first part of the problem is in developing standards for specifying the hazard so that products can be rated and equated. The hazard(H) could be based upon the product's target or victim(V), toxicity(T), and persistency(P). This might be expressed as:

$$H=f(VTP)$$

Values could be assigned to the parameters and a hazard rating arbitrarily (but with some scientific basis) assigned from the products score. See Figure 2.

V	T	P
people=A	extreme=4	>wk =W
fish & aquatic animals=B	bad=3	<wk, >day =X
birds & plants=C	moderate=2	<day, >hr =Y
water supply=D	mild=1	<hr =Z
recreation & esthetic=E	none=ϕ	

Where A>B>C>D>E and W>X>Y>Z

Figure 2

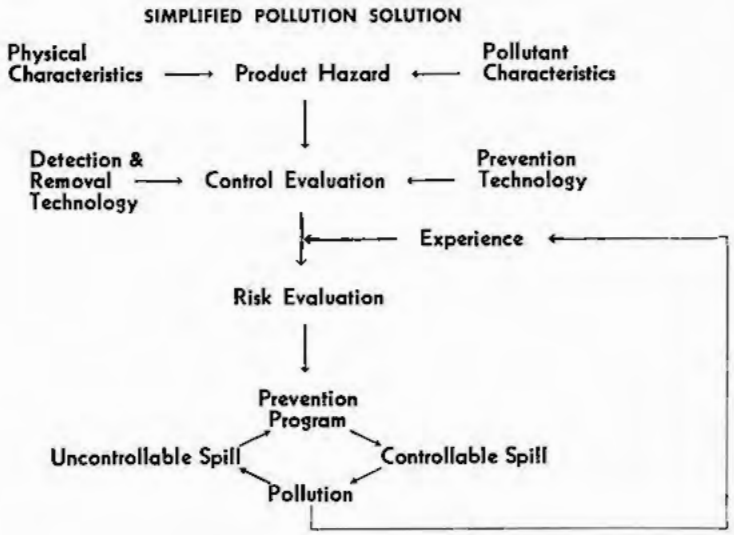


Figure 1

Thus, for example, any product scoring greater than B3X for any victim or a total score for all victims greater than (A+B+C)2X would be in the highest hazard rating. The necessary number of ratings and their end points could be established to span the range of pollution.

The control evaluation is a straight forward evaluation of current technology. With this in hand, some degree of risk must be established. The risk (R) as a function of parameters may be expressed as:

$$R=f(HQEUTMP_a)$$

Where:

- H=Product hazard (previously established).
- Q=Quantity of product involved.
- E=Environmental conditions at the time and location of the spill. (Would include temperature, stream flow characteristics, human population and aquatic life exposure.)
- U=Water use. (Water quality standards are based upon an assigned water usage.)
- T=Time to detect or available to detect the product release and to begin some type of response.
- M=Mitigation factor. (Accounts for any after spill action which ameliorates the pollution.)
- P_a=The Probability of product release. (Based upon the preventive measures required.)

With a conservative approach E, U, & M can be assumed to maximize the risk thus limiting the problem to:

$$R=f(HQTP_a)$$

At this point there is a choice of solutions based upon the hazard. A probability of spill can be assigned and a risk or calculated risk can be assigned and the probability of spill calculated. Calculating the probability of spill or nonspill appears the better answer with sufficient data available to estimate the probability of failure of the different strategies and thus determine a prevention program. No system exists yet to solve this problem, but these ideas should indicate the trend of thinking on this problem.

A recent accelerated but extensive study of the general spill problem, revealed a nearly total ignorance of this subject. There is insufficient data available to pinpoint causes of spill pollution and to identify where corrective efforts should be used. Perhaps one of the most significant actions to result from the Water Quality Improvement Act of 1970 will be the mandatory reporting of spills. These reports should provide valuable information on the real causes and their probable rate of occurrence. The consequences of a spill are not in all cases well established. Particularly, the long term effects of a spill require a great deal of study.

There are many products carried today which are unregulated, are probably routinely discharged to the waterways, and which constitute a long-term ecological hazard. Recent examples are the Great Lakes' area concern over mercury and DDT. The job of designating hazardous materials, i.e., those that are a pollution problem, has been assigned to the Department of the Interior under the authority of the 1970 Water Quality Improvement Act. The "Evaluation of the Hazard of Bulk Water Transportation of Industrial Chemicals" done by the National Academy of Science for the Coast Guard is a good beginning, but only a beginning.

The ability to clean up or neutralize a spill is extremely limited. To date only the relatively simple problem of oil has been attacked. (Because oil is easily visible, it tends to separate from the water and retain its identity.) But a level has not been reached where the cleanup capability can be neglected.

Finally the tolerance or acceptance of pollution must be considered. At present, public indignation is high and political pressure dictates a very low tolerance level. However, man cannot live without modification of his environment. The tolerance level must be established by a national scientific analysis and assignment of water usage. Some progress is being made by the Government and the academic community in this respect. Zero defects is not possible.

What progress is being made in our efforts to curb pollution from marine transportation? Overall, the problem of pollution from marine cargoes is under control. A rational approach has been made primarily with chemicals because the requirements either preceded or were developed concurrently with the establishment of the marine transportation mode of the product. Oil, however, has been shipped from sometime prior to our full awareness or concern for its pollutant properties. A formal rational approach is needed to replace the past

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Commander Stirling is a 1953 graduate of the Coast Guard Academy. After brief service on board the USCG Cutter Perseus *and the Destroyer Escort* Lowe, *he served as Assistant Engineer Officer on the Cutter* Pontchartrain *and later as Engineer Officer aboard the Cutter* Matagorda. *From June 1957 to June 1960, he was a postgraduate student at the Massachusetts Institute of Technology where he was awarded a Master of Science Degree in Naval Architecture and Marine Engineering. He served as Engineer Officer aboard the icebreaker* Northwind *during two Bering Sea Patrol missions and then was assigned to the Merchant Marine Technical Staff at Coast Guard Headquarters until July 1965 when he became Chief, Electrical Section, Merchant Marine Technical Branch at the 3d Coast Guard District Office in New York. In August 1967, he returned to Headquarters as Chief, Electrical Engineering Branch of the Merchant Marine Technical Division and also assumed duties as Project Coordinator for vessel oil pollution and prevention and Project Officer for marine sewage devices. CDR Stirling holds memberships in the Society of Naval Engineers and in the Society of Naval Architects and Marine Engineers.*

"seat of the pants" approach to the problem.

Although the pollution problem from cargoes is under control, the same cannot be said for daily marine operations. The Maryland State authorities feel their single largest routine source of oil on the Chesapeake Bay is the waste oil and dirty bilge pumpings of transient vessels. This is inexcusable.

The Water Quality Improvement Act of 1970 calls for the President to issue regulations for the prevention of oil pollution. This act also provides for a $10,000 penalty for deliberate discharge of oil and a $5,000 penalty for failure to comply with the regulations. The Department of the Interior has defined a harmful quantity of oil as any discharge which violates applicable water quality standards or causes a film or sheen upon or discoloration of the surface or shoreline, or causes a sludge or emulsion beneath the surface. With this definition and the above penalties, some rather radical changes in our present system of handling shipboard waste oils, tank slops, and dirty bilges can be expected. The Nation is no longer willing to provide free waste disposal to the marine industry. Waste disposal is a legitimate cost of business and the industry must recognize it as such. ⚓

CLEANUP

(*Continued from page 45*)

response to a spill posing a substantial threat to public health and welfare. In June 1970, a new plan, based on the previous one, was published in order to meet the requirements of the Water Quality Improvement Act of 1970, which passed last April. Under the new plan, the Coast Guard was assigned responsibility for furnishing or providing for on-scene commanders for spills on the high seas, coastal and contiguous zone waters, and coastal and Great Lakes port and harbor areas. This on-scene commander is responsible for the coordination of Federal response efforts at the scene. The plan also requires the Coast Guard to have equipment and trained personnel available in the above areas to take the necessary cleanup action where the responsible party is either unable or unwilling to respond adequately.

Unfortunately, present technology for cleaning up oil spills and other types of polluting spills is sadly inadequate. This fact has been most evident at major spills such as the offshore oil well blowout at Santa Barbara, Calif., in January 1969, and the oil well incident off the Louisiana coast last February. It was most distressingly demonstrated in March 1967, when the supertanker *Torrey Canyon* ran aground off the southern coast of England, spilling 119,000 tons of crude oil into the sea. The desperate and largely futile efforts of the British and French to cope with this oil captured the attention and sympathy of people all over the world. Even for small oil spills, moreover, the cleanup methods that are now used are almost totally ineffective except in very calm and sheltered waters. Some commonly used methods such as dispersion of spilled oil with chemical detergents may even do more harm than good to the marine ecology. Finally, very little is known about how to cope with spills of the variety of chemical products which are now being shipped in bulk for the first time.

To provide an effective oil spill cleanup capability in the United States, the Coast Guard is now conducting an intensive $4 million a year research program to develop new techniques and equipment. This research will be continued on a high priority basis for several years and a wide variety of approaches to the oil spill cleanup problem will be explored.

Initial emphasis has been placed on preventing spills from distressed tankers offshore and on preventing spilled oil from spreading out on the sea surface. An air-deliverable system for offloading oil and other potential pollutants from grounded or otherwise damaged tankers is an early product of our research program. The theory behind this system is that it is much easier to remove a ship's oil cargo before it spills than to try to clean up the same oil after it has spilled into the water. A prototype system has been built, and testing and refining is almost completed. The system consists of pumps, transfer hoses, and rubberized nylon bags for temporarily storing the oil. It is designed

Commander Charter is a 1955 graduate of the Coast Guard Academy. He served his first tour of duty aboard the USCG Cutter Matagorda *as Navigator until January 1957. Transferred ashore at that time, he was stationed with the Captain of the Port, Honolulu, as Executive Officer, through February 1958. His next tour was as Commanding Officer of the Loran Station at Niigata, Japan, until his move to the Coast Guard Reserve Training Center in Yorktown, Va., as an instructor in September 1959. In February 1964, he became Executive Officer of the USCGC* Reliance. *Before being assigned to his present position at Coast Guard Headquarters, he served as Group Commander of Group Mobile in Alabama until August 1968.*

A COAST GUARD workboat pays out an experimental boom in an oil containment exercise.

416-055—71——2

THIS WORKBOAT SPRAYS a chemical dispersant on an oil spill.

to be flown on short notice to the scene of an offshore tanker accident, dropped by parachute, and deployed by a specially trained Coast Guard pollution control team. A rapid response is possible because Coast Guard aircraft and other resources are kept at a high state of readiness at all times. The pumps and transfer hosing will be used to pump the oil from the vessel into the temporary containers before it spills into the water. The first operational system is scheduled to be ready for use in about 1 year.

The other problem that the Coast Guard is giving highest priority is that of preventing spilled oil from spreading on the water surface. Once oil has spilled into the water, it must be confined in as small an area as possible if cleanup measures are to be effective. If the oil is allowed to spread out over a large area, it is much harder to clean up and causes more damage. Many oil slick containment "booms" or "fences", as they are called, are now being sold commercially to oil companies and other potential users. Another method which is coming into use is the air bubble barrier, which creates surface currents by releasing air bubbles underwater. This device has the advantage of allowing vessels to pass freely through. Also, it can be permanently installed at an oil dock and instantly activated when a spill occurs.

Unfortunately, these products are effective only in very calm, sheltered waters where the water currents are very slow. In open waters, the action of the wind and waves washes the oil over and under these barriers, making them almost totally useless. None of the many commercial products tried at the Gulf of Mexico oil well incident last March were able to hold the oil slick against the forces of the sea. In view of the inadequacy of present technology, the Coast Guard has been conducting research on the problem for several years. We are now ready to begin construction of a prototype high seas oil slick barrier. If this prototype is successful, the Coast

AN OIL SPILL in the Schuylkill River near Philadelphia in November of last year prompted many makeshift attempts at containment. This one involved absorbent materials retained by chicken wire and suspended from a bridge overhead.

Guard hopes to have an operational version within a year. Eventually, the system may be packaged for delivery by Coast Guard aircraft to the scene of an oil spill. This feature will reduce the response time to a minimum.

After an oil slick has been confined to a limited area—or even if it has not been confined—there is the problem of recovering the oil or somehow treating it so as to make it less destructive. Many inventive methods of doing this have been proposed. Some of them are quite ingenious; so far, however, no single method has proved to be sufficiently promising to warrant a large investment by the Coast Guard. We are keeping an open mind and are funding research on many different approaches. Let me briefly mention some of the techniques which are being considered.

Chemical dispersion of oil is perhaps the most commonly used method of making an oil slick disappear from the water surface. Detergents and other chemicals can dissolve an oil slick so that it mixes with water and thus becomes less visible. Unfortunately, the oil can do more harm to fish and other marine life when it mixes with the water than when it remains on the surface. Also, the chemicals themselves are usually toxic to marine life. Chemical compounds which stick to oil and sink it to the bottom have similar disadvantages in that they bring the oil into contact with shellfish and other bottom life. They also tend to release the oil to the surface after a period of time. Because of these harmful side effects, chemical dispersants and sinking agents often do more harm than good. Consequently, the Federal Water Quality Administration has published guidelines prohibiting use of these methods except under certain specified circumstances, such as when waterfowl or important shore areas are threatened by the oil. Dispersants may also be used if, in the judgment of the on-scene commander, there is a hazard to human life or limb or a substantial fire hazard which could be reduced by dispersing the oil.

Another approach is to absorb spilled oil with straw or some other plant fiber. Straw was used extensively at the Santa Barbara, Calif., oil well incident last year. Buoyant plastics and foams have also been tried, but straw seems to work best. This method has the advantage of not introducing the oil or any chemicals into the water below the surface. Its chief disadvantage is that recovering the absorbing material after it has soaked up the oil can be very costly and slow, especially if the slick has spread out over a large area.

When an oil slick has been confined and is thick enough, some of the oil can be removed simply by vacuuming the surface of the water. Septic tank cleaning trucks are often used for this purpose. As the slick becomes thinner, this method fails because large quantities of water are picked up along with the oil. Current oil-water separation techniques are not efficient enough to make this method practical under such circumstances.

Burning oil slicks on the water has been given considerable attention as a method of removing them. Special chemical agents have been developed by several companies to facilitate this process. Obviously, this method cannot be used in port areas where the fire might spread. In open waters, on the other hand, it can be very difficult to ignite an oil slick unless it is fairly thick and its more volatile components have not evaporated.

Biological degradation of oil slicks by special strains of bacteria or other micro-organisms is another area in which research is underway. As yet the feasibility of this method has not been determined, but it may be possible to accelerate the natural process by which oil decomposes in the water.

The Coast Guard is also concerned with the great number of hazardous substances other than oil which are increasingly being shipped in bulk quantities and which could cause serious pollution and safety hazards if spilled. Because of the variety of these chemicals and the scarcity of knowledge about some of them, it is difficult for nonspecialists to know what to do when there is an accident involving one or more of them. We are now developing a solution to this problem. The National Pollution Response Center established by the National Pollution Contingency Plan and located in Coast Guard Headquarters will house a computerized information system which will be able to provide real-time technical guidance to personnel at the scene of a spill or a potential spill of oil or hazardous substance. Some type of rapid communication with a data bank at the center will be provided for Coast Guard units at major ports, Coast Guard district offices, and other users. By providing certain key information about a spill situation, such as the substance involved, the type of area threatened, weather conditions, and other parameters, an on-scene commander will be able to get instant information about the dangers involved and advice as to what action he should take. The information system will be developed and operated by the Coast Guard but will be available to other users. Developmental work on this system has just begun.

These, then, are some of the approaches to the "cure" for pollution by spills of oil and other substances. As the Coast Guard's research program progresses, the necessary equipment and materials will be purchased and maintained at locations where polluting spills are most common or could cause the most damage. Specially trained Coast Guard pollution control teams will stand ready to respond to any major incident. With proper management and adequate funding, American technology can rise to the challenge of controlling water pollution by oil. ⚓

GULF BLOWOUT SENDS 27 MEN TO SEA IN NEW CAPSULE

The Brucker Capsule floats peacefully beside a Coast Guard buoy tender.

A gas blowout occurred sometime between sundown and midnight on December 20, 1970, on a Shell Oil Co. drilling platform in the "Ship Shoal" drilling area *Block 293 B,* Gulf of Mexico. Of the 27 men aboard the platform at the time of the accident, 24 boarded and lowered the Brucker Survival Capsule to the water. One man was picked up in the water and the remaining two boarded at the cellar platform deck. With all men accounted for, the capsule moved away from the platform and was soon picked up by a service tender which had been alerted by signal flares from the capsule. There were no injuries, no fires, and no pollution of any sort. The drilling contractor was the Two R Drilling Co. of New Orleans.

The Brucker Survival Capsule is part of the Whittaker Survival System, manufactured by the Whittaker Corp., La Mesa, Calif. This system was approved by the Coast Guard on August 1, 1968, for use on non-self-propelled drilling rigs, fixed structures, and artificial islands. An article on the capsule appeared in the September 1970 issue of the *Proceedings.* ‡

Seamanship Trophy Nominations For 1971 Award

The Maritime Administration is now receiving nominations for the American Merchant Marine Seamanship Trophy.

The award, a sterling silver cup, has been presented in 5 of the past 9 years to a U.S. citizen for deeds exemplifying the highest traditions of seamanship and maritime skills. A committee of labor and management officials from the steamship industry will review the nominations and determine if the trophy is merited this year.

Nominations must be made according to the following criteria:

1. The candidate must be a U.S. citizen. Only individuals are eligible—corporations, partnerships, associations are excluded.

2. The candidate must have performed a feat of distinguished seamanship while aboard a civilian-manned U.S. flag vessel during the calendar year 1970.

(a) "Distinguished seamanship" has been defined by the Select Committee to include either a distinguished feat of professional competence in the presence of extreme peril to life *or* property or an outstanding feat of seamanship exemplifying the highest standards of professional competence.

(b) "U.S.-flag vessels" may include yachts or other small craft.

3. All nominations must be received by the Secretariat, c/o Eastern Region Director, Maritime Administration, 26 Federal Plaza, New York, N.Y. 10007, by April 1, 1971. ‡

Sunoco Litter Bags Go to Sea

If users of highways and navigable waters were as conscious of not littering as is Jeff Long on the water road he travels as a Sunoco tankerman, water pollution control in this country might soar into orbit.

Jeff, a 19-year old seaman on the S.S. *America Sun,* was concerned that the men who sail Sunoco ships on occasion were thoughtlessly tossing personal trash into oceans, bays and rivers. Jeff's prime objective is to prevent the decomposition and decaying of personal trash which poisons marine life.

So the young seaman from Fort Washington, Pa., suggested to Capt. George Larimer, manager of Sun's marine department, that personal litter be placed in large bags for proper disposal in port. These bags would supplement existing company procedures aboard ship for handling empty paint cans, slop oil, galley trash, and other combustibles.

In commending Jeff for his suggestion, Captain Larimer advised that litter bags were being placed aboard all ocean-going ships for the collection of all personal waste—tin cans, discarded books and magazines, cartons, oily rags, and other possible contaminants. Such bags had already been installed on Sun's inland barge fleet at the request of Sunoco tugboat crewmen.

A graduate of Springfield (Montgomery County) High School, Jeff has been sailing aboard Sunoco tankers since September 1969. His home port is Marcus Hook, Pa. ⚓

—Sun Oil Co.

Oil Pollution Conference Planned For June 1971

Information on oil spills continues to grow rapidly. In order to cope with advances in its prevention and control, the American Petroleum Institute, the Federal Water Quality Administration, and the Coast Guard are sponsoring the 1971 Joint Conference on Prevention and Control of Oil Spills. The 3-day international meeting will bring together industry and Government officials at the Sheraton Park Hotel in Washington, D.C., June 15–17.

In addition to an exhibition of spill control equipment, the conference will cover such topics as new procedures and techniques for preventing oil spillage, such as new tanker designs and improved petroleum handling procedures, the physical, chemical, and biological behavior of spilled oil, the effectiveness and possible adverse effects of material used to disperse, sink, burn, or otherwise dissipate oil slicks, and many more.

Anyone interested in additional information should address inquiries to Joint Conference Secretary, American Petroleum Institute, 1101 17th Street NW., Washington, D.C. 20036. ⚓

Merchant Marine Statistics

There were 766 vessels of 1,000 gross tons and over in the active oceangoing fleet on December 1, 1970, according to the Maritime Administration.

There was one less active and eight less inactive ships in the privately owned fleet as compared to the number of ships in these categories on November 1, 1970.

Two ships were delivered from construction; five were transferred to foreign flag, four were sold for scrap, one was transferred to the Government and one was declared a constructive total loss. The privately owned fleet decreased by nine to 799 during November.

The Maritime Administration's active fleet decreased by two and its inactive fleet decreased by 22 during November. Three vessels were transferred to the Reserve Fleet from Navy, one was transferred from private, and 28 were sold for scrapping; thus decreasing the Government fleet to 808.

The total U.S. flag merchant fleet decreased by 33 to 1,607. ⚓

Special Public Hearing March 30, 1971

A Special Public Hearing has been scheduled for Tuesday, March 30, 1971 at 9: 30 a.m. in Room 2230 Nassif Building, Washington, D.C. to consider amending dangerous cargo regulations concerning the shipment of hypochlorite solutions. Further information on dangerous cargo regulations proposals requiring public hearings will be included in next month's *Proceedings.* ⚓

Cargo Location Signs

The placement of "cargo location signs" on barges as required by 46 CFR 151.45–2(e) (subchapter O) recently prompted an industry inquiry. These signs are required so that in the event emergency action is necessary, the cargo aboard can be identified easily and reference made to the cargo information cards. In an effort to clear up any confusion, the following guidelines are offered:

- The signs must state the tank location and the name of the hazardous materials aboard the barge.
- They can be positioned individually above each cargo tank carrying a hazardous material or displayed as a single sign listing all hazardous materials and tank numbers aboard the barge.
- They need face only one direction.
- The color and dimensions of the signs must be as specified in 46 CFR 151.45–2(e).

A Quick-Action Manhole Guard

OPEN MANHOLE. The words bring to mind the picture of the fall guy walking or backing in with hilarious results. In the real world, safety men know that the unguarded opening is a man-*killer*. So, we say, "guard them." Easier said than done. Most guards are clumsy, blocking needed access, or take too long to put in and take out. Not so with a spring-action guard invented by E. Bollinger, erection foreman for Pott Industries, Inc., of St. Louis, Mo.

As shown in figure 1, the guard is simply two pieces of steel pipe, each welded to a toeplate. Another toeplate is welded to a collar pipe which slides over the main pipe. The tops of both main pipes are welded to an 8-inch railroad car truck spring. The guard is fitted to a manhole by pulling the toeplates together, inserting them in the hole, and allowing the spring to press the pipes against the hole edges. The loose collar-mounted toeplates are slid down against the deck and toggle pins inserted through both pipes to hold. A series of holes permits secure alignment with nearly any thickness of deck or manhole collar.

A Bureau engineer found how secure the guard was by having a 200-pound worker push and pull against either arm. The guard did not budge. Only when both pipes are pulled together can the guard be moved. Figure 2 shows a blower hung from two padeyes attached to the underside of the pipes. A worker can enter easily, by simply pushing the blower aside, which swings back into place. A small bonus on this arrangement is the removal of blower stands from decks where they sometimes present a tripping hazard.

The Bollinger guard is not patented, and might be utilized by any organization with a similar manhole-guarding problem. ⚓

—Safety Standards U.S. Department of Labor

Figure 1.

Figure 2.

NAVIGATION AND VESSEL INSPECTION CIRCULAR 1–71

JANUARY 8, 1971

Subj: Repair of Boiler Safety Valves

PURPOSE

The purpose of this circular is to outline conditions of Coast Guard approval and acceptance when safety valves are repaired under the provisions of Section 59.01–5, Title 46 CFR, Subchapter F, Marine Engineering.

CANCELLATION

This circular supersedes and cancels Navigation and Vessel Inspection Circular 1–70 dated 8 April 1970.

BACKGROUND

The history of repairs to safety valves has involved discoveries of patently unsafe conditions as well as other associated problems. For example, safety valves have been found with decreased relieving capacity caused by improper repairs. The manufacturer's nameplates had been destroyed, which resulted in an inability to determine whether or not the valve was of approved design or who repaired the valve. If failure of the valve had occurred, there was no means of establishing responsibility. The situation resulted in the valves being rejected for further use onboard Coast Guard inspected vessels.

DISCUSSION

Previous history of unsatisfactory repairs to safety valves has demonstrated a need to establish uniform repair and acceptance criteria in order that safety standards will not be diminished when safety valves are repaired. In view of the hazards that prevail when improper workmanship or improper material is used in the repair of safety valves, it is necessary that these repairs be kept under strict Coast Guard inspection so that the repaired valve performs in a manner at least equal to a new approved valve manufactured in accordance with 46 CFR 162.001.

SAFETY VALVE REPAIRS

(a) In accordance with 46 CFR 59.01–5, proposed repairs to safety valves must have the prior approval of the Officer in Charge, Marine Inspection, before being undertaken. Safety valve repairs may be made by the original manufacturer or by a repair facility acceptable to the cognizant Officer in Charge, Marine Inspection.

(b) Whenever repairs require the replacement of parts, such parts whenever possible shall be made by the safety valve manufacturer. If parts cannot be obtained from the manufacturer within a reasonable time, the repair shop may make the part or purchase it from other sources. However, the workmanship must be of good quality and at least equal to that required in manufacturing the original valve. The materials used in the replacement of parts of safety valves shall have corrosion and heat resisting properties at least equal to the material used by the manufacturer in the original or initial construction. When parts are not supplied by the original manufacturer, the corrosion and heat resisting properties of materials shall be verified by metallurgical reports covering parts produced or used by the repair shop.

(c) If a new valve body is supplied, a tapped drain opening of a size and location as specified in 46 CFR 162.001–4(f) shall be fitted (Specification Subpart 162.001). After the repairs have been satisfactorily completed, the safety valve shall be set under steam pressure and shall meet the prescribed blow-down and popping tolerances as given in 46 CFR 162.001–4(i) before the valve can be accepted.

(d) The nameplate of the original manufacturer of the safety valve shall not be removed. If necessary to remove this nameplate to perform repairs, it must be replaced when the work is completed.

ACTION

The following procedures outline criteria for Coast Guard acceptance of repairs of safety valves in accordance with 46 CFR 59.01–5:

(a) Repairs effected and replacement parts used shall comply with the standards outlined in paragraph 4 above.

(b) The nameplate of the repair shop shall be securely attached to the valve body. This corrosion resistant nameplate shall show the name and address of the company or person performing the repairs, and the month and year the repairs were made. ⚓

CURRENT THAT KILLS

Electrical energy is mishandled and misused in much the same manner on shipboard as is the case ashore. Fires, shock injuries, and even deaths are therefore not uncommon.

Any electric device, whether portable or stationary, which is not metallically bonded to the ship's structure may permit a man who touches it to receive a shock. As more hand electric tools come into use and both the ships and the tools grow older, there is increasing chance of the shock hazard.

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

The cords of many tools come equipped with three-pronged plugs. On the Mariner Class ships, the receptacles are built for three pronged plugs and as soon as the tool is plugged in, it is safely grounded. On the majority of present day National Shipping Authority ships, the receptacles are only two-pronged. This requires an independent ground with a battery clamp at one end in order to complete the ground. If the tool has a three conductor cord, the third or ground wire protrudes from the cord just before the cord enters the two-pronged plug. The battery clamp should be made fast to this wire. A single strand of #14 ga. copper wire should be used for the ground wire if a three-conductor cord is not available.

The cord or cable on electric tools should be replaced—not spliced—if damaged. Electric hand tools should never be allowed on floor plates where they might become damaged or constitute a tripping hazard. Inspect regularly for damaged plugs, receptacles and cable connections at tool and plug.

Electricity can hang you or help you.

PORTABLE LAMPS AND CORDS

The makeshift portable lamp or extension or trouble light, as it is sometimes called, is another major source of shock injury. Such lamps usually are little more than metal encased sockets, to which metal guards are clamped or screwed.

Moisture, which is very likely to be encountered in many places aboard ship in which such lamps are used, may greatly reduce the insulating properties of the socket and permit the current to leak to the metal case.

The cord is usually any piece of available two-conductor wire and is invariably fabric covered. It is not moisture or oil proof and after even limited use is just as dangerous as the metal socket and/or guard. Its insulation is flimsy and unable to withstand the wear and tear such a light must withstand. The cord usually doesn't totally fill the opening in the socket and as a result, moisture can leak in and "short" the metal case.

Usually there is a heavy duty rubber coated cord available that is moisture and oil proof and will withstand a lot of abusive use. However, it is still necessary to use a third or ground wire from the metal socket and guard to the ship's structure.

A far superior alternative, of course, is the commercial modern portable lamp which has the triple safety of:

- Hard rubber covered socket and guard.
- Neoprene covered cord which is moisture and oil proof and vulcanized into the socket.
- A third conductor to ground the device and afford protection from shock in the event of failure of the rubber coating of the metal parts.

OTHER SHIPBOARD SHOCK HAZARDS

Following are a set of safe practices which concern other electrical features of the ship, many of which are no less dangerous than the improperly handled or defective portable appliance:

- Keep hands off all electrical circuits unless your duties require it.
- Treat all electric circuits as though they were "hot" until *you* personally make sure they are dead.
- Stand on a dry rubber mat or board if possible when working on electrical equipment.
- See that the rubber mat is in place in front of switchboard, that the guard rail is unimpaired and the

area behind the board is fenced off and the door kept locked; open oil or other control switches of a circuit before opening the main knife switch; stand clear of switch when operating it.

- When removing fuses, only use approved type fuse tongs; be sure all fuses used are of the correct rating for the load; never bridge a fuse.
- Use only properly designed and insulated tools when working on electrical fixtures and equipment; use an approved type of insulated circuit tester (of a suitable voltage rating) or voltmeter, when checking circuits, to see if they are energized. ⚓

—The Safety Valve.

MAIN DECK HAZARDS

Several Offshore Safety Committee meetings, and more recently, the Joint Accident Prevention Committee in Tacoma, Wash., reported some difficulty in effectively warning persons of the possibility of being struck by moving loads before they stepped from the passageway to the main deck, abreast of hatches No. 3 and No. 4 on mariner-type vessels.

The problem was discussed in each port area on the coast, with several possibilities for corrective action submitted. The most practicable solution came from American Mail Line's safety director, Capt. Paul F. Stumpf who, in coordination with the SS *Japan Mail's* Chief Mate C.B. Engelstone, submitted the photos (above) along with the following outline for implementation.

To quote Captain Stumpf: "* * * looking forward to No. 3 Hatch, we stencilled in yellow the black housings for the afterguy winch motors at No. 3 hatch and hung three dusters from the overhead. These dusters are so situated that they will graze the top of the head of a person of normal height. Looking aft to No. 4 hatch, we have a board 2-feet wide by 3-feet high with a single leg in back * * * stencilled in yellow on the board are the words, 'WARNING—BEWARE OF MOVING LOAD.' This sign is positioned in the center of the main deck passageway so that a person must step around it in order to gain access to the main deck—thereby becoming aware of the potential hazard."

Looking fwd to No. 3 hatch

Looking aft to No. 4 hatch

Captain Stumpf also stated that the idea could be utilized aboard C–3 (or similar type) vessels through the use of two signs similar to those pictured above at No. 4 hatch.

Since the signs first appeared, Chief Officer Englestone reports that the "* * * signs have been effective and that he has * * * received many favorable comments on them." ⚓

Courtesy The Channel.

AMENDMENTS TO REGULATIONS

Title 33 Changes

Chapter I—Coast Guard, Department of Transportation

PART 3—COAST GUARD AREAS, DISTRICTS, MARINE INSPECTION ZONES, AND CAPTAIN OF THE PORT AREAS

General Description

As required by 5 U.S.C. 552, 33 CFR Part 3 provides a description of the structure of the Coast Guard's organization for the performance of its assigned functions and duties. In general, the Coast Guard organization consists of the Commandant, assisted by the Headquarters staff, two

CORRECTION

Navigation and Vessel Inspection Circular 3–70 dated 20 April 1970 and published on page 174 of the September 1970 issue of the *Proceedings* contained an error in the list of cargoes under the heading, "Application of Subchapter O to Existing Barges". In 46 CFR Part 40, the second listed cargo should be "Propylene oxide", not "Propylene".

Area Offices to act as intermediate echelons of operational command, and District Offices to provide regional direction and coordination. This document provides amendments to Part 3 which will bring this part into conformance with present administrative practices.

The amendments contained in this document are as follows: Subpart 3.01 has been revised to provide a current description of the Coast Guard's organization and assignment of functions: Subpart 3.04 has been added to provide a description of the Eastern and Western Area Offices which act as intermediate echelons of Coast Guard command; and changes in descriptions of jurisdictions have been made for the First, Third, Fifth, Seventh, Eighth, Fourteenth, and Seventeenth Coast Guard Districts for conformance with present administrative practices.

Since this is a matter relating to agency management, it is exempted from notice of proposed rule making and public procedure thereon by 5 U.S.C. 553 and the amendments may be made effective in less than 30 days after publication in the FEDERAL REGISTER.

The complete text of these changes was published in the "Federal Register" of January 20, 1971.

STORES AND SUPPLIES

Articles of ships' stores and supplies of a dangerous nature certificated from November 1, 1970, to December 31, 1970, inclusive, for use onboard vessels in accordance with the provisions of Part 147 "Regulations Governing Use of Dangerous Articles as Ships' Stores and Supplies on Board Vessels" are as follows:

ACCEPTABLE HYDRAULIC COMPONENTS

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

Manufacturer	Valve type	Identity	Maximum allowable pressure (p.s.i.)
Vickers Marine & Ordnance Division, Troy, Mich. 48084	Relief	C*-10-**-2*	3,000
Do	Sub Plate	C*GM-815	3,000
Do	do	CGVM-1*S-815-1*	3,000
Do	do	C*GM-825	3,000
Do	do	C*GM-24S-825	3,000
Do	do	CGM*-10S/03-1*	3,000
Do	do	CGM-06*-2*	3,000
Do	do	CGM-10*-2*	3,000
Do	do	DGSM-04*-1*	3,000
Do	do	DGSM-06*-5*	3,000
Do	do	DGSM-10*-1*	3,000
Do	do	URG*M-**-1*	3,000
Do	do	RXGM-***-*-2*	3,000
Essex Recon Corporation	4 Way Valve	100487	2,000
Fluid Power Division	do	100173	1,500
72 W. Drullard Avenue, Lancaster, New York 14086	do	100579	2,000

CERTIFIED

Chemola Corp., 8502 Glenvista, P.O. Box 34215, Houston, Tex. 77034. Certificate #890, dated December 21, 1970, THERM-O-PLATE 22 ANTI-SEIZE.

Certified Laboratories, Inc., P. O. Box 2493, Fort Worth, Tex. 76101 Certificate #888, dated November, 20, 1970, CERTIFIED AQUA-SOL

Drew Chemical Corporation, 522 Fifth Ave., New York, N.Y. 10036 Certificate #889, dated November 20, 1970, DEWT-L

FUSIBLE PLUG

The regulations prescribed in subpart 162.014, subchapter Q, specifications require that manufacturers submit samples from each heat of fusible plugs for test prior to plugs manufactured from the heat used on vessels subject to inspection by the Coast Guard. A list of approved heats which have been tested and found acceptable during the period from August 15, to September 15, 1969, is as follows:

The Lunkenheimer Corp., Cincinnati, Ohio 45214. Heat Nos. 770, 771, 772, 773, 774, 775, 776, 777.

AFFIDAVITS

The following affidavits were accepted during the period from November 15, to December 15, 1970:

Webster Electric Co., Inc., 1900 Clark St., Racine, Wis. 53403, FITTINGS.

Truly Tubular Fitting Corp., 151 East Third St., Mt. Vernon, N.Y. 10550, FITTINGS.

Rich Manufacturing Co.,[1] P.O. Box 910, Corona, Calif., 91720, VALVES, FITTINGS, FLANGES.

[1] Is presently listed in CG-190 Equipment Lists but has changed address and added fittings and flanges to their listing.

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 will be furnished by mail to subscribers, free of postage, for $2.50 per month or $25 per year, payable in advance. The charge for individual copies is 20 cents for each issue, or 20 cents for each group of pages as actually bound. Remit check or money order, made payable to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Regulations for Dangerous Cargoes, 46 CFR 146 and 147 (Subchapter N), dated January 1, 1970 are now available from the Superintendent of Documents price: $3.75.

CG No.	TITLE OF PUBLICATION
101	Specimen Examination for Merchant Marine Deck Officers (7–1–63).
108	Rules and Regulations for Military Explosives and Hazardous Munitions (5–1–68). F.R. 6–7–68, 2–12–69, 10–29–69.
115	Marine Engineering Regulations and Material Specifications (3–1–66). F.R. 12–18–68, 6–17–70, 12–30–70.
123	Rules and Regulations for Tank Vessels (5–1–69). F.R. 10–29–69, 2–25–70, 6–17–70, 10–31–70, 12–30–70.
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, 5–11–67, 12–23–67, 6–4–68, 10–29–69, 11–29–69.
172	Rules of the Road—Great Lakes (9–1–66). F.R. 7–4–69, 8–4–70.
174	A Manual for the Safe Handling of Inflammable and Combustible Liquids (3–2–64).
175	Manual for Lifeboatmen, Able Seamen, and Qualified Members of Engine Department (3–1–65).
176	Load Line Regulations (1–3–66). F.R. 12–6–66, 1–6–67, 9–27–67, 7–12–68, 6–5–69, 7–26–69, 10–29–69.
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, 5–11–67, 12–23–67, 6–4–68, 11–29–69.
190	Equipment Lists (8–1–68). F.R. 11–7–68, 11–8–68, 11–16–68, 11–19–68, 11–20–68, 12–11–68, 12–18–68, 2–11–69, 2–18–69, 2–21–69, 2–26–69, 3–15–69, 3–27–69, 4–4–69, 4–12–69, 4–19–69, 4–25–69, 4–26–69, 4–28–69, 5–3–69, 5–9–69, 6–18–69, 6–19–69, 7–1–69, 7–15–69, 7–17–69, 9–12–69, 9–25–69, 10–10–69, 10–11–69, 10–22–69, 10–31–69, 11–19–69, 12–13–69, 1–27–70, 1–30–70, 2–3–70, 2–26–70, 3–11–70, 3–14–70, 3–25–70, 4–14–70, 5–7–70, 5–27–70, 7–18–70, 7–21–70, 8–15–70, 9–29–70.
191	Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel (5–1–68). F.R. 11–28–68, 4–30–70, 6–17–70, 12–30–70.
200	Marine Investigation Regulations and Suspension and Revocation Proceedings (5–1–67). F.R. 3–30–68, 4–30–70, 10–20–70.
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 (5–1–68). F.R. 10–29–69, 5–15–70, 9–11–70.
249	Merchant Marine Council Public Hearing Agenda (Annually).
256	Rules and Regulations for Passenger Vessels (5–1–69). F.R. 10–29–69, 2–25–70, 4–30–70, 6–17–70, 10–31–70, 12–30–70.
257	Rules and Regulations for Cargo and Miscellaneous Vessels (8–1–69). F.R. 10–29–69, 2–25–70, 4–22–70, 4–30–70, 6–17–70, 10–31–70, 12–30–70.
258	Rules and Regulations for Uninspected Vessels (5–1–70).
259	Electrical Engineering Regulations (3–1–67). F.R. 12–20–67, 12–27–67, 1–27–68, 4–12–68, 12–18–68, 12–28–68, 10–29–69, 2–25–70, 4–30–70, 12–30–70.
266	Rules and Regulations for Bulk Grain Cargoes (5–1–68). F.R. 12–4–69.
268	Rules and Regulations for Manning of Vessels (5–1–67). F.R. 4–12–68, 4–30–70, 12–30–70.
293	Miscellaneous Electrical Equipment List (9–3–68).
320	Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf (11–1–68). F.R. 12–17–68, 10–29–69.
323	Rules and Regulations for Small Passenger Vessels (Under 100 Gross Tons) (7–1–69). F.R. 10–29–69, 2–25–70, 4–30–70, 10–31–70, 12–30–70.
329	Fire Fighting Manual for Tank Vessels (7–1–68).

CHANGES PUBLISHED DURING JANUARY 1971

The following has been modified by Federal Register:
Subchapter A, of Title 33 CFR, Federal Register of January 20, 1971.