PROCEEDINGS
OF THE MARINE SAFETY COUNCIL

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Gas Fire and Explosion Fatal to Four . . .

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COVERS

FRONT COVER: This month's feature casualty involved a tugboat, a tank barge, a motorboat and a waterfront petroleum product loading facility. Pictured on our cover are the involved tugboat, left, and the heavily damaged barge, which suffered a violent explosion in its after rake tank. The vessel at right assisted in firefighting efforts.

BACK COVER: The SS *Alaskan Mail* is pictured in the Port of Seattle prior to her departure for the Far East and Southeast Asia. She will provide container/breakbulk service from the Pacific Northwest to the Orient. Courtesy American Mail Lines.

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PROCEEDINGS

OF THE

MARINE SAFETY COUNCIL

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Ensign A. W. Vander Meer, Jr., Editor

GAS FIRE AND EXPLOSION FATAL TO FOUR

SIX PERSONS RETURNING from a hunting camp in a 14-foot, plywood, outboard motor boat ran slowly into a low-hanging mist of vapors. One man was lighting the way with a 12-volt, battery-powered, hand-held spotlight, while another operated the craft. The operator's two sons were sitting midships on an ice chest, while two other guests were sitting on the boat's floor aft. All of the boat's occupants were wearing lifesaving devices—some having left the devices' straps untied.

Seeing the foglike mist, the operator throttled his 110-horsepower gasoline engine down. He recognized that the mist was not fog, and assumed it to be gas vapors. Immediately he headed for the nearby left-descending bank of the alternate waterway of the Gulf Intracoastal Waterway, and shouted a warning, "Don't smoke!" to his passengers.

Nearing the bank, the motorboat grounded. The operator immediately secured the engine, and the two passengers riding aft attempted to tilt the engine up and off the bottom. The operator's sons began looking for a paddle. The operator then attempted to restart the engine with the battery-powered electric starter. Suddenly the boat was engulfed in flames. The occupants went overboard immediately, and either swam or attempted to swim underwater and away from the flames.

The operator and his sons reached the left-descending bank and ran up the levee and away from the fire. One of the passengers who had been trying to lift the boat's engine off the ground swam underwater and surfaced midstream with flames all around him, but at some distance away. He heard the operator of the boat call out from ashore and, redirected, he headed toward the left bank. He found a fellow passenger in the water near the bank and with the aid of the operator, helped him out of the water. All five of the survivors from the motorboat were severely burned, but they were picked up and taken to the hospital where three of them subsequently died. The body of the sixth passenger was recovered from the water some time later.

The same night, inspected barge *Sun Chem 1100* was pushed to the Wanda Petroleum Dock, mile 18 Morgan City to Port Allen alternate route, Gulf Intracoastal Waterway, La., by the uninspected tugboat *New Work*. (See box for details of these two vessels.) The barge had last carried a cargo of benzene and, having previously unloaded that cargo, was scheduled to take on 10,000 barrels of natural gasoline from the Wanda Petroleum facility.

The loading operation was to begin at about 9:30 p.m., but due to plant difficulties, the operation was delayed. At about 11:20 p.m., the dock's two tankermen and the tugboat's master left the telephone shack of the dock facility. Shortly thereafter the three of them saw a blue flaming ball across the waterway and upstream. The ball grew rapidly in area size, and the men abandoned the platform for a small motorboat moored at the foot of a slanting embarkation ladder. The tankermen made it to the boat, but their momentum caused the boat to drift away from the platform. The master jumped for the boat, but went into the water. One tankerman assisted him into the boat while the other tried unsuccessfully to start the outboard. With flames spreading rapidly toward the platform the men expected an explosion, and they abandoned the boat for the safety of the water where they swam underwater as far as they could. One of the tankermen swam directly to shore. The other surfaced, flames on the water all about him. He heard the master shouting for help, but could not see him. The flames precluded him from searching for the master. He then went underwater and con-

THE VESSELS INVOLVED

Of the three vessels involved in this casualty, the motorboat is adequately described in the text.

The *New Work* is a 47.9-foot tugboat of 36 gross tons. Its propulsion is by diesel giving 336 horsepower. She is neither Coast Guard inspected nor required to be.

The *Sun Chem* 1100 is a 145-foot tank barge of 614 gross tons. It was inspected by the Coast Guard in August of 1968. It contains a total of six cargo tanks, three sets of port and starboard. In addition it has forward and after rake tanks and one pump well void.

The New Work *was scorched by the fire in the alternate route of the Gulf Intracoastal Waterway, but otherwise she remained seaworthy and was able to push the still watertight* Sun Chem 1100 *to Port Arthur, Tex., for repairs.*

tinued to swim for the bank. The tankermen, suffering from minor burns, reached the bank and ran into the swamp, away from the burning area. They returned to the waterway about a half mile downstream where they awaited rescue.

Aboard the *New Work* a deckhand heard a "puff like" explosion from across the waterway and upstream. He saw the opposite side aflame, fire spreading rapidly toward the dock. He sounded an alarm to the mate who was sleeping. Both men hurried to the after end of the tug where the deckhand took cover and the mate jumped overboard. The deckhand then helped the mate back aboard the vessel.

When flames reached the barge, it exploded in the after rake end—the barge's decking over the after rake end was opened and rolled forward for half the barge's width.

Fire spread rapidly to the dock and the barge's cargo continued to burn.

The two men on the tugboat were knocked down by the explosion; they recovered and abandoned ship into the water. They swam downstream for several hundred yards, where they took refuge on the partially sunken hulk of an abandoned towboat. They were rescued later.

Four persons died and seven were injured as a result of the casualty described above. An understanding of the circumstances leading up to the fire is essential to an analysis of the casualty.

The Wanda Petroleum Dock is located in a remote area along the right-descending bank of the alternate route at Mile 18 of the Gulf Intracoastal Waterway. It was built

WANDA PLANT AND PROCEDURES

The plant involved in this casualty produces liquid petroleum raw products from natural gas, demethanized products (DMI), piped from local wells. The DMI is received into the plant via a 10-inch product line (DMI line), which feeds continually into the plant's fractionators where it is fractionized into ethane-propane, propane, isobutane, normal butane, and natural gasoline. These products are then stored in tanks or underground caverns. The DMI line passes about 2,000 feet north of the loading dock. The products are transported away from the plant by truck, train, or barge.

All of the products produced and stored at the plant are transported to the dock via a single 10-inch pipeline 16 miles long, with a capacity of 6,259 barrels. Peak flow through the pipeline is about 3,000 gallons per hour, and pressure within the pipeline may vary from 50 to 150 p.s.i. This pressure is sufficient to maintain the flow and to keep the cargo in a liquid state.

Since a single pipeline was used to transport different cargoes from the plant to the dock, during the loading of any particular barge, the intended cargo of the barge to load next was kept in mind. Thus, whenever a change in cargo was to be accomplished, the barge being loaded was filled until 6,259 barrels of cargo (the capacity of the pipeline) remained to be loaded. At that point the plant operator would cease pumping the cargo for the present barge and begin pumping the anticipated cargo for the next barge. This second cargo would then push the first cargo ahead of it into the first barge as loading was completed. In theory the pipe was charged to its capacity with the next anticipated cargo when the present barge was fully loaded. To accomplish this procedure the plant supervisor would advise the operations supervisor or foreman what the loading meter should read when the change of cargoes in the pipeline should be made. This meter reading figure was then passed to the dock tankerman who in turn would advise the plant operator when that meter reading was reached. The plant operator would then begin pumping the second cargo.

A zone of transition or mixed products would exist when this procedure was followed. The amount of this mixture was estimated at about 10 barrels—more or less—depending on the rate of flow of the cargoes. The slower the flow, the greater the mixing.

There were two means of clearing the pipeline of unwanted cargo. First the cargo loading line piping at the dock was arranged so that cargo could be directed into an 8-inch bypass system which branched into the 10-inch DMI line some 2,000 feet north of the dock. Cargo could be directed through the bypass branch and back to the plant via the DMI line. Second, smaller amounts of unwanted cargo or mixture could be exhausted from the 8-inch line between the bypass valving and the loading arm for attaching the hose between dock and barge, through a 6-inch unfired flare line venting into the atmosphere from a 40-foot-high flare stack located in the swamp about 350 feet away from the dock.

under the authority of a permit issued by the U.S. Army Corps of Engineers and had been operating for 2 months prior to this casualty.

The captain of the port, New Orleans, had not been made aware of the dock or loading facility, and the facility had not been inspected. The provisions of the Code of Federal Regulations (33 CFR 126.27), however, issue a general permit to operate such a facility under specified conditions even when the captain of the port is unaware of its existence. This dock was operated under the authority of such a general permit.

The dock consists of two platforms set on piles. The platform closest to the waterway is 24 feet wide by 15 feet deep and has four mooring caissons—two at each end, to serve as the moorings and loading points for tank barges. The second platform, 36 by 24 feet, provides a service area for piping, meters, and a telephone shack. The two platforms are connected by a 75-foot catwalk. The dock is a loading facility for a petroleum plant located about 16 miles northeast of the dock.

The dock was manned only when cargo was being loaded into barges, generally by one tankerman, grade A and lower, liquefied petroleum gas and liquefied natural gas who had been documented by the Coast Guard under the provisions of 46 CFR 12.20–1. Dock access was not limited to tankermen alone; undocumented persons or persons not holding port security cards could board the dock. By agreement with its customers, Wanda's employees—documented tankermen—were responsible for the loading of barges. By the conditions of this agreement vessels' tankermen were denied authority to assist in the loading operation. (See box headed "Wanda Plant and Procedures" for details of the loading operation.)

On July 21, 1970, an undocumented barge began loading normal butane at the Wanda Dock. At a certain point in the loading operation, natural gasoline was started into the 16-mile, 6,259-barrel-capacity pipeline from the plant to the dock, thereby pushing normal butane ahead of it. When the loading was completed, the Wanda plant operation log was marked, the pipeline "Now has gaso. in it." The amount of natural gasoline in the pipeline at the time of shutdown was undetermined.

Two days later at about 8:55 p.m., on July 23, the M/V *New Work,* pushing T/B *Sun Chem 1100,* arrived at and moored port side to the Wanda Petroleum Dock. The barge was to load about 10,000 barrels of natural gasoline. At about the same time two tankermen, Wanda employees, arrived at the dock via a small outboard motor boat.

After mooring the barge and the *New Work,* the tug's master and his deckhand/tankerman assisted the Wanda employees in connecting the 8-inch cargo hose between the dock and the barge's loading manifold. Two battery-powered, sealed mooring lights were set out and displayed on the barge, and a grounding wire was attached between the barge and the dock.

The *Sun Chem 1100* was water ballasted in the after rake end for

In this picture, taken from the barge, is shown the damage to the railing structure and the pipeline that leads from the shore to the barge loading terminal. Parts of the structure are still smouldering, as manifested by the smoke rising at the center of the picture.

the trip to the dock. The tug's deckhand opened the ballasting valve (by a reach rod) to deballast the rake end by letting the water gravitate out. The after rake manhole was opened to allow for pressure equalization as the ballast water ran out.

The master then advised one of Wanda's tankermen regarding procedures to set up the cargo tank manifold valves so that the barge would load level. Tank valves to No. 1 port and starboard tanks were fully opened 12 full turns; tank valves to No. 2 port and starboard tanks were opened six turns; and tank valves to No. 3 port and starboard tanks were opened three turns.

Wanda's tankermen inspected the *Sun Chem 1100* and found the six cargo tanks clean and dry. The barge, whose last cargo was benzene, was not gas free. Deballasting of the after rake was secured. The expansion tank manholes to all cargo tanks were open. Though flame screens were available for these manholes, it could not be determined whether they were in place.

At about 9:15 p.m., the tankermen were satisfied that the barge was ready to receive the natural gasoline cargo. The loading operation was turned over to them in accordance with the agreement, and the tug's master and deckhand/tankerman returned to the *New Work*'s galley.

The dock tankermen returned to the dock, where one of them took a temperature reading of the product then in the mouth of the pipeline. The thermometer showed between 33° and 35° F., indicating there was at least some normal butane in the line. The tankerman called the plant on the direct line and informed the plant operator of his temperature reading. He was told that this was probably due to a transition zone between the former product and the natural gasoline (whose temperature would have been 48° to 65°). It was agreed that loading operations could be commenced. The operator started the pump, but was unable to push cargo toward the dock due to a storage cavern piping valve being closed. This delayed the loading operation, but once the process foreman was contacted at his home and advised the control operator how to locate the proper valve, the valve was opened, and pumping was begun.

This time pumping was unsuccessful because the emergency shutdown devices at the dock valves had set, preventing any flow to the barge. The foreman was again contacted at home, and he advised the tankermen on procedures to reset the emergency shutdown devices by resetting to the "on" position two intraconnected pneumatic switches. At about 10 p.m., the loading operation was finally begun.

Between 3 and 15 minutes after the commencement of loading, mist-like vapors were seen pouring from the barge's six open cargo tank manholes. The vapors floated onto the barge's deck, then spilled overboard and onto the alternate waterway. The *New Work*'s deckhand testified that he saw the vapors spilling from the manholes, stepped out on deck and questioned the tankermen about them. He alleged that the tankermen told him there was a little wrong product in the line, it was being expelled, and everything would be all right. The deckhand returned to the tug's galley.

The tankermen testified that upon seeing the vapors, one of them called the plant and told them to secure the pumping. This was done at the plant, and the valve on the loading arm was shut. The line was then vented for 3 or 4 minutes through an unfired flare line. Vapors were seen venting from this line and spilling onto the the alternate waterway. At this time a tankerman took a second temperature reading on the product in the line. The temperature was again 33° F.

Venting was secured, and the loading line was opened to the barge for

3 or 4 minutes and afterward the temperature was again taken. The thermometer still registered 33°.

Once again the process foreman was reached at home. He was told of the apparent wrong product in the line, that the meters showed 549 barrels of product had been sent through the line, and that the 33° temperature reading indicated that normal butane or a normal butane rich mixture was still in the line. The foreman advised the tankermen to prepare to displace the wrong product out of the line. Deck and plant personnel began setting up the piping and valves to displace the product in the line.

At about 11 p.m., the *New Work*'s generator oversped. The master and the deckhand went to the engineroom where the master secured the fuel to the generator. Though the generator stopped, sparks which were caused by the overspeeding continued for a short time to come out through the stack, extinguishing themselves in seconds without incident. The tug was without power. The master then went on the dock and called his company—advising them about the generator overspeeding and possible damage to the generator. He then waited on the dock, awaiting a return telephone call. With him were the two tankermen. It was about 11:20 p.m., when the men saw the blue ball of fire, and the three abandoned the dock. Moments later the fire reached the dock, and an explosion, which was heard as far as 10 miles away from the scene, ensued.

Shortly after the explosion, the natural gas wells feeding into the plant's feedline were secured. In addition to the civil agencies such as local rescue units, law officers, the fire department, and a State wildlife and fisheries agent, many local persons turned out to assist in the rescue and firefighting efforts. The Coast Guard and the Army Corps of Engineers were notified and their personnel proceeded to the scene. Supervisory people from Wanda Petroleum arrived to assist and advise as necessary, and the waterway was closed to all traffic but emergency craft.

In the early morning hours of July 24, a Corps of Engineers vessel arrived. The fire on the tug was out and fire on the barge had diminished. Fire continued to burn from the ruptured pipeline. The vessel moved alongside the barge and extinguished the fire with foam. The fire at the ruptured pipeline was not considered a further hazard and was allowed to burn itself out.

Postcasualty examination of the area around the scene indicated that vegetation on the left-descending bank immediately opposite the dock was completely burned and discolored for 2,200 feet along the bank and to a maximum distance of 80 feet inland from waterside. The waterway is 590 feet wide at the downstream (southern) side and 375 feet wide at the upstream end of the dock.

The tug *New Work* received moderate damage from the explosion and her paint was scorched, but she remained seaworthy. The *Sun Chem 1100* suffered severe explosion and fire damage above the waterline, but remained watertight. Repairs were made to the barge at Port Arthur, Tex.

The Coast Guard conducted an investigation to determine the cause of the casualty, the responsibility therefor, and to attempt to obtain information to help prevent or to reduce the effects of similar casualties in the future.

The investigating officer concluded that the proximate cause of this casualty was a spill of normal butane cargo which polluted the air immediately above the waterway creating a latent hazardous condition. It is likely that the liquid measure of 549 barrels of cargo transferred to the barge or vented through the flare line was all or nearly all normal butane of sufficient volume, when vaporized, to cover the area involved in the casualty to a depth of several feet. It was concluded that, while ignition of these vapors could have

THE GASES INVOLVED

Natural gasoline (casing head gasoline) is a liquid petroleum product consisting of the heavy hydrocarbons extracted from natural gas by such means as compression, absorption, and other processes. Natural gasoline is defined further for commercial purposes by the following specifications:

(1) Reid vapor pressure	10–34 pounds.
(2) Percent evaporated at 140° F	25–85.
(3) Percent evaporated at 275° F	Not less than 90.
(4) End point	Not higher than 375° F.
(5) Corrosion	Not corrosive.
(6) Doctor test	Negative "sweet".

Normal butane or N-butane is a colorless gas with a characteristic natural gas odor. It is a byproduct in petroleum refining or natural gasoline manufacture. In its gas state, it is considerably denser than air. Its vapor density at 60° (air has a density of 1) is 2.07. N-butane, C_4H_{10} is further defined by the following specifications:

(1) Vapor pressure	14 to 550.
(2) Boiling point	31.1° F.
(3) Freezing point	—217° F.
(4) Solubility in water	Negligible.
(5) Specific gravity 60° F	0.563.
(6) Flash point	Gas.
(7) Flammability limits (percent by volume).	1.86–8.41.
(8) Autoignition temperature	760° F.
(9) Volume—1 pound liquid	0.0049 barrels.
(10) Weight—1 barrel liquid	210.0 lb.
(11) 1 gallon of liquid N-butane vaporizes to 30.77 cubic feet of gas, an expansion ratio of 237.5.	

come from a number of sources, the most likely source of ignition was the motorboat (or its occupants) which came into the area from the hunting camp.

The tankermen employed at the dock were charged with the safe operation of the dock and the loading of natural gasoline into the *Sun Chem 1100*. Yet they failed to identify the cargo to be loaded before loading when means to do so were available. In addition, they disregarded safe operating procedures and continued to load a normal butane or a rich normal butane mixture into the barge or deliberately expelled the product from the pipeline into the atmosphere, which saturated the air over the waterway with hazardous vapors and therefore contributed to the casualty. These failures were considered by the investigating officer to be evidence of gross negligence on the part of the tankermen.

The handling of hazardous gasoline/natural gas products is inherently dangerous and requires safeguards commensurate with the operation. Yet in this case, followup measures were not performed to insure that the pipeline was fully charged with the intended product and so logged; plant and dock employees were not fully trained or knowledgeable about the piping systems they were required to operate; adequate supervision was not readily available to advise or direct personnel during unusual or emergency situations or to insure that the safeguards and operating procedures were followed. In addition, the use of an unfired vent to expel unwanted products from the piping system was a severe hazard to life and property in the vicinity. These deficiencies were considered evidence of negligence on the part of the dock and plant owners.

The investigating officer also concluded:

—That it is likely that the manhole for the *Sun Chem 1100*'s after rake tank was open or not fully secured, allowing the ingress of hazardous vapors and ignition into that tank. This resulted in the explosive atmosphere and subsequent explosion within the tank. In addition, it is probable that flame screens were in place over the open manholes to the cargo tanks, accounting for the fact that these tanks burned only at their openings.

—That the *New Work*'s generator "ran away" due to the rich normal butane mixture in the immediate atmosphere.

—That in view of the inherent hazards associated with the petroleum industry, the regulations governing the inspection of waterfront facilities may be too permissive. The regulations allow for the safe operation of such facilities, under a general permit until inspected by the Coast Guard. Yet there is no obligation on the part of the owners to notify the Coast Guard that the facility exists. Therefore hazardous conditions could exist at a waterfront facility of which the Coast Guard has no cognizance.[1]

—That the regulations of the Code of Federal Regulations (33 CFR 126.27) require guards on a dock such as this one at times other than when barges are actually being loaded. Violation of this regulation did not, however, contribute to the casualty. ⚓

The above photograph was taken from the starboard side of the Sun Chem 1100*'s deck, looking aft. It shows the expansion trunk to the No. 3 port and starboard tanks, the manifold, and much of the damaged area. The rigging at the top right is the shore side connection to the manifold on the barge.*

[1] In the Federal Register of Dec. 24, 1971, the Coast Guard published proposed oil pollution prevention regulations that would revise the present permit system for waterfront facilities. The proposal, as presently envisioned, should provide greater control of spills from waterfront facilities. This casualty is surely germane to the continuing consideration of the proposal in public rulemaking procedures.

WHY NOT POLLUTE?

Lt. (jg.) William W. Smoker, U.S. Coast Guard

Office of Marine Environment and Systems, Marine Environmental Protection Division

The topic of pollution has commanded a tremendous amount of attention in the pages of this magazine and elsewhere. Laws and regulations to stop the pollution of the world's waters have been proposed, debated at length, praised, and condemned. Time and again the mariner has been told that pollution is bad and should be eliminated, yet perhaps the basic reasons behind all the talk of regulation, prohibition, and enforcement have been lost in the shuffle. The following article is intended to highlight those reasons.—Editor

WHY IS THERE so much public concern with ocean pollution? Why are restrictive laws concerning ship operations in effect and stricter ones proposed? Mariners ask these questions more and more frequently as public concern for pollution problems grows and pollution control laws follow. It would seem that newspapers and Congresses do not realize the immense size of the seas compared to our activities on them.

In an age when carriers are measured in hundreds of thousands of tons rather than the tens of thousands of a few years back the amounts of oil and many other products moving across the sea are large and continue to grow. In spite of better loss prevention through such practices as safer construction of ships and traffic control, the amount lost is still large and the possibility of very large accidental losses is greater and greater.

What is Pollution?

"Pollutant" could describe any material put into the sea by human activities, but is more useful if it is used to refer to harmful material put into the sea by man's activities. This may not be an easy distinction to make: the effects of different amounts of a pollutant may not be evident for a long period of time or it might appear that the material is beneficial when its ultimate effect is harmful. Effects of pollutants are felt primarily by the communities of plants and animals in the ocean; their existences depend on a very delicate balance of a large number of physical, chemical, geological, and biological factors, any one of which could be upset by a pollutant. A trace of a certain chemical in the water could discourage the growth of a plant, reducing the numbers of, for instance, clams or shrimps, which feed on the plant. Another material might reduce the amount of oxygen in the water enough to eliminate some fish in the area, allowing a less desirable fish to exist there in greater numbers.

Sources of Marine Pollution

Much of the pollution of the oceans comes from sources on land. Large seacoast cities dispose of their garbage, sewage, construction wastes, and industrial wastes in the sea. Cities such as New York carry garbage by barge to certain offshore sites and dump it into the sea. New York also barges treated sewage waste, sludge, and some industrial wastes to offshore dumping sites. Much of the sewage produced by seacoast cities is simply piped raw into salt water. Industrial wastes from inland cities, acid wastes from steel mills, and sulfite waste from pulpmills for example, are frequently dumped into rivers and are shortly poured into the ocean. In a similar manner insecticides from crop sprays are washed out of the soil and can be traced to the sea where they are found in plants and animals. Dredge spoil, waste material from the dredging of harbors and channels, is also dumped at sea; in some harbors this spoil is itself polluted and when it is dumped offshore further pollutes the area where it is dumped.

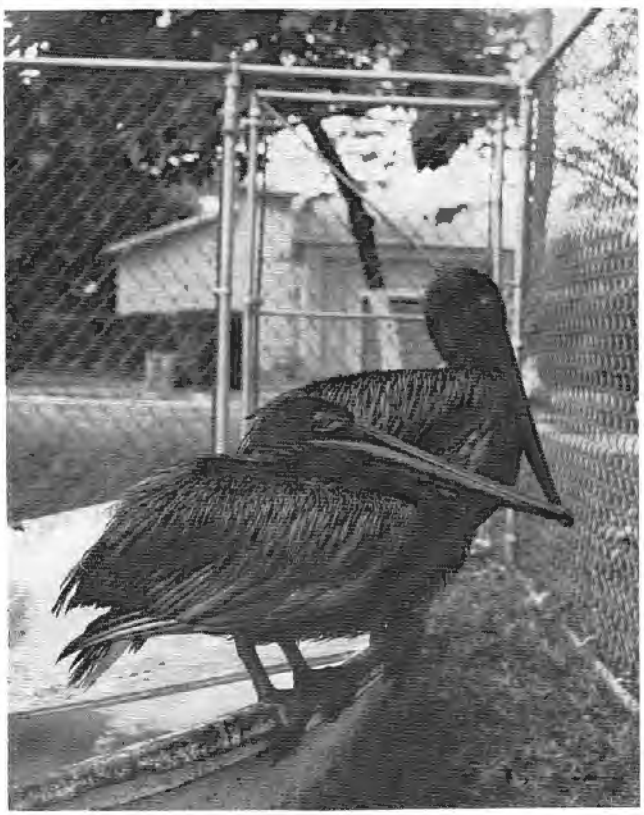
Ships are responsible for similar kinds of pollution. They typically discard garbage, sewage, and oil. Oil, one of the major pollution problems faced at sea, is released from ships when bilges are pumped, when cargo tanks are cleaned or deballasted, when fuel oil bunkers are deballasted, and by accidents. Leaks, spills, and accidents at offshore drilling installations further contribute to oil pollution at sea.

Effects of Marine Pollution

The harmful effects of pollution are primarily biologic

ones; they are most evident when a commercially valuable stock of animals is destroyed. Many biologists and sociologists foresee a shortage of food in the world in the next few decades; if this is even merely a possibility, marine animals, which are characteristically very nutritious, should be safeguarded. Japan, for instance, for many years has gotten most of its protein food from the ocean in fish, shellfish, even seaweed.

Pollutants act on marine plants and animals in a number of ways. Chemicals, insecticides, or heavy metals such as mercury, are assimilated by microscopic plants. Quite possibly the amounts accumulated by these plants would not be harmful to them, but these plants are the ultimate source of food for all animals in the sea. Clams and oysters eat these plants, as do the small shrimplike crustaceans, which are the food of fish, seals, even whales. Each animal must consume many times its own weight in food during its lifetime and frequently will retain all or a large percentage of a pollutant contained in its food. A moment's thought will make it clear, then, that the larger animals will have more of the pollutant in their bodies than is in the water around them—they concentrate it. Even if affected organisms are not themselves hurt, economically valuable animals tainted in this manner can easily affect humans: in Japan during the 1950's many people died of minimata disease or mercury poisoning after eating fish caught in Minimata Bay. The bay was heavily polluted by industrial mercury from a plastics manufacturer. Not long ago an entire fishery in the United States—the swordfish fishery—was closed because the fish were found to contain more than allowable amounts of mercury in their flesh. There are other examples as well of ocean pollution making food sources dangerous for human consumption—some clam beds off the New York-New Jersey coast, for instance, are closed to harvesting due to high levels in the clams of disease organisms from sewage disposal. Similarly there are several examples in the United States of valuable fisheries which have been lost due to pollution or are in danger of being lost: San Francisco Bay's clam stocks are no longer there; the newspapers report that an oyster crop along the Florida coast is threatened by the effluent of a papermill. These are intricate economic problems and of indirect concern to mariners but indicate the possible dangerous implications of ocean pollution.



These pelicans were aided in Operation Pelican Wash after the wreck of the tanker Ocean Eagle *in San Juan Harbor. They had nearly died from oil suffocation. Hopefully man's continuing awareness of the effects of water pollution and his continuing effort to minimize pollution and its effects will someday avert such tragedies.*

Many chemicals can have profound effects on biologic systems even in very small, barely measurable amounts. In addition to their tendency to be concentrated by food chains, chemicals may have other effects. Marine animals are generally very sensitive to "smells" or traces of chemicals in the water. They use this sensitivity in their hunt for food, their courting behavior, and migrations. If a pollutant closely resembles the smell of one of these "keys" or overpowers the animal's senses, one of these behavior patterns may be seriously disrupted, disrupting in turn the balance of the entire community.

Much of the world's oxygen, perhaps 50 to 90 percent, is produced by marine plants: any major threat to their health from any pollutant, or a pollution-caused disruption of marine communities, could conceivably threaten the earth's oxygen supply. Carbon dioxide in the sea is important to biologic production, both because plants use it in the manufacture of food and because the amount of carbon dioxide in the water determines its acidity. Oceanic communities are very sensitive to acidity—any major change could seriously harm them. Carbon dioxide is dissolved into the sea from the atmosphere. In the atmosphere it plays a role in determining the amount of heat received by the earth from the sun. Atmospheric carbon dioxide is known to have increased significantly in the two centuries since the industrial revolution; a corresponding increase in carbon dioxide content of the sea may be occurring though the processes are slow and difficult to observe. Pollution of the sea, by affecting these as yet poorly understood relationships, could affect the sea's ability to absorb carbon dioxide with serious consequences for the earth's climate. These processes are not well understood but are known to exist; they

indicate the possible far-reaching effects of ocean pollution.

Spilled oil is the ocean pollutant of most concern to ships: such accidents as the Torrey Canyon stranding in 1967 released great amounts of oil onto the sea and caused great public concern for biologic and aesthetic damage from the spilled oil. It is estimated that in excess of $5 million was spent in attempts to clean up 800,000 gallons of crude oil spilled by a tanker collision in San Francisco Bay in January 1971.

Some of the most obvious effects of oil pollution are fouled beaches and dead sea birds but longer term effects may he more insidious and longer lasting. Especially the lighter, more volatile, components of oil dissolve into the sea rather than remaining afloat. These dissolved oils are absorbed into plant and animal tissues where they are detectable long after the water is clear of oil. This absorbed oil may hamper the organism's growth, or, later, when the time comes to reproduce, a vital process might be stopped. The toxic effects of oil residue could harm animals months after a spill. In the case of oil spilled in a quiet harbor the deaths of small plants and animals (the most susceptible ones) could harm the marine community both by depriving the larger consumers of food and by depriving the water of oxygen (oxygen is a byproduct of food production by plants and is consumed when dead organisms decompose). The loss of oxygen produced by plants could decrease the number of plants and animals able to live in the water. The decomposing bodies would keep the water oxygen-poor, long after the surface had been freed of oil. Much of the heavier parts of spilled oil would sink to the bottom of the bay, undoubtedly harming the animals there. We know, for instance, that in some harbors where ships have moored over a period of years, studies show the bottom to be oil soaked and that none of the usual worms, clams, or crabs live there.

Sewage, some industrial wastes, as well as other organic pollutants dumped into an enclosed body of water, put an immediate demand on the oxygen content of the water, using the oxygen in oxidation or "rotting" of the pollutant. If enough sewage were introduced, the oxygen supply might well be reduced to a point at which organisms could not live. Harbors like New York's have such areas in which nothing lives. Sewage also introduces the disease organisms mentioned previously.

But how, you say, can man's pollution have much effect when the ocean is so tremendously large? It covers two-thirds of the earth to an average depth of 2 miles! Several traits of the ocean and pollutants should be recognized. First and most obvious is that the entire ocean is not available to absorb pollution; in fact only constrained areas are exposed to pollution.

Municipal and industrial pollution of the sea is localized along coastlines. Pollution by ships also occurs along coasts for they spend a significant portion of their time actually in harbors and many of their routes are along

Deceased, the victims of an intentional oil discharge in the York River are a wild duck and a turtle. Water pollution has this obvious effect on marine life. Less obvious and more ominous effects may be happening beneath the oceans' surfaces.

coastlines. Open sea pollution by ships is localized in the areas well traveled by ships—the various sealanes leading between major ports of the world. The depth of water exposed to pollution is also restricted. The coastal harbors and estuaries into which pollutants are introduced are shallow, on the order of 10 fathoms rather than the 2,100 fathoms average depth of the ocean. Similarly the depth of water in the open sea over which mixing occurs, hence the part of the sea susceptible to pollution, is also restricted; it is perhaps 50 fathoms, again considerably less than 2 miles. Mixing is caused by wind blowing over the sea and is limited in depth by the average force of the winds; water below 50 fathoms is generally colder and denser than the surface water and there is little mixing between the two layers. Much of the plant and animal life of the open ocean lives within this surface mixed layer and more especially in coastal and estuarine areas, unfortunately where exposure to pollution is greatest. When ships at sea release waste, it is usually done in small, relatively concentrated volumes of water such as the pumpings of a bilge or sanitary system tank. Such a patch of highly polluted water, which if diluted perhaps two or three times would be relatively innocuous, remains concentrated and dangerous to marine life for relatively long periods (depending on wind conditions, the makeup of the pollutant, and a variety of conditions) before it is well mixed into the sea. A very large problem of this sort is created when accidents release great volumes of pollutants into the sea which may not be dispersed or broken down for very long times. The very nature of our use of the sea therefore tends to concentrate pollution where it is most dangerous; at the surface and near shores.

Some pollutants, especially organic ones such as sewage or oil, can be "absorbed" by the sea: organisms (bacteria) in the sea consume the pollutant, breaking it down

(*Continued on page 95*)

GANGPLANKS A VITAL AREA FOR SAFETY

THE GANGPLANK is the most important working surface on the ship. Everyone who comes aboard—visitors, passengers, repairmen, and longshoremen, as well as the crew—uses it. Since the degree of caution, agility and sobriety of all who come aboard cannot be controlled, it is of the utmost importance that the gangplank be constructed, rigged, and maintained in such a manner as to give all practical protection to the users.

TAUT RAILS

Rails are usually of rope in single lengths leading from the lower end of the gangplank, through the stanchions on the turntable to a cleat on the ship. Continual attention (frequently neglected) is necessary to slack or tighten the lines as the ship rises and falls alongside a pier. A slack handrail gives a false sense of security and is almost worse than none at all, while if the rail becomes too taut it will either part or bend the stanchions.

One means of assuring properly taut handrails along the plank itself is to secure the upper ends to the head of the gangplank. The lines from the upper stanchion of the plank to the bulwark are then spliced in as tails at the upper stanchion. Because these tails are short and the stanchions on the turntable close together, they are easy to adjust and need not be as tight as the rails along the gangplank.

NONSKID SURFACES

Unless the gangplank or accommodation ladder has a permanent nonskid surface, such as expanded metal or grating construction, nonskid material of some kind should be applied and renewed as necessary. Nonskid paint, sand in wet paint, abrasive materials, either of the type which is troweled on or that which is manufactured on a fabric base may be used.

On fixed-tread accommodation ladders the nonskid material should be applied to the tread nosings as well as to the surface of the treads, and on brow-type gangplanks it should be applied on and between the cleats.

DUCK BOARDS

Fixed-tread accommodation ladders should be covered with cleated duck boards, when the angle is low, to avoid the necessity of walking on the edges of the treads. Cleats on the underside or other substantial and easily adjusted means of securing the duck boards in position should be provided.

The boards should be installed or removed as the angle of the ladder changes. This will be facilitated by hinging the boards to one rail of the accommodation ladder. When not in use they may be lashed on edge against the stanchions.

ROLLER GUARD

Men sometimes have their feet caught under the wheels or roller at the lower end of the gangplank as the ship surges. This can be prevented by hinging a U-shaped metal strap on the axle so that it will rest on the edge of the pier in front of the wheels or roller and push a man's foot away before it could be caught.

MAINTENANCE AND RIGGING

A number of sectional wooden accommodation ladders have rotted out where the fastenings for the metal end fittings go through them. All wooden gangplanks should be inspected for rot and cracks each time they are rigged.

All fittings, particularly the pins and shackles joining the gangplank and the turntable, should be inspected regularly for rust and wear. Supporting bridles should be long enough so that the spreader will clear a tall man's head at any angle of the plank.

LIFE NET

It is recommended that a life net be rigged by each ship under all gangplanks or accommodation ladders in such a manner as to prevent a person from falling between the ship and dock. The net should be secured to the ship and to the wharf or pier edge so as to cover the area between the ship and dock in way of the means of access:

- For a distance of 6 feet on either side of the means of access if rigged as a thwartship brow plank.
- To extend 6 feet beyond the ends of the means of access if there is an accommodation ladder or gangplank hung parallel with the ship's side.
- To extend 6 feet beyond the turntable or platform in prolongation of the plank or ladder and 6 feet beyond the point of intersection of the plank with the stringpiece of the wharf if rigged at an angle.

GENERAL SAFETY PRECAUTIONS

Double handrails or man ropes should be provided on both outboard and inboard side of gangway; stanchions should be secured in sockets with cotter or toggle pins.

Measures should be taken to prevent overcrowding of gangway; gangway watchmen should be instructed to check regularly on conditions of the gangway due to changes in elevation from tide and draft and to see that all crewmembers and passengers ascend and descend gangway in a safe manner.

Gangways should be adequately lighted at night.

A life ring with throw-rope attached should be kept readily available at gangway in case a man falls overboard.

Gangways should be free from grease, oil, trash, etc. ⚓

—Courtesy, The Safety Valve of District 2 MEBA

lessons from casualties

LIFE LINE COULD BE MISNAMED

A father and his son were fishing from the father's wooden commercial fishing vessel off the coast of California, some 135 miles southwest of San Francisco. The 40.5-foot boat was rigged with 10 fishing lines locally known as "jig" lines. Early in the morning, the wind was blowing at 22 to 35 knots from the northwest with a sea of 8 to 10 feet. The boat was equipped with 5-inch-diameter poles about 25 feet long secured at their bases amidships. Attached to the outboard ends of each of the two poles is a 15-inch-diameter sphere. This system, known as "flopper droppers", served to stabilize the craft. This vessel was not Coast Guard inspected, nor was it required to be.

Several fish had been caught and were lying on deck when the son decided to wash down the deck. He decided to use a bucket to get sea water for that purpose instead of using the available water pump. He leaned over the lifeline, using it for support, and dipped his bucket into the sea. Suddenly the bucket caught a wave, and the lifeline parted. The son fell overboard. Although the son knew how to swim, he was dressed in heavy clothing, oilskins, and rubber hip boots, which made swimming difficult if not impossible.

The father immediately reversed the boat's engine and notified the Coast Guard. The vessel backed down over her fishing gear, but the father had difficulty swinging her as he desired. He threw several life preservers overboard, none of them falling within reach of his son. He then tried to maneuver the starboard stabilizer within reach of his son, but to no avail. Seconds later the father watched his son disappear beneath the surface. After unsuccessfully searching the area for about 5 hours, the father departed. He was joined in his search by a Coast Guard fixed-wing aircraft, but the son was never seen again.

A subsequent examination of the fishing boat revealed the lifeline which had parted was a plastic-covered $\frac{3}{16}$-inch-diameter, multi-strand, galvanized cable, rigged 15 inches above the bulwark. The plastic was stripped off the ends of the line where it was secured to the thimbles by swagged collars. The exposed ends were rusty and corroded.

The conclusion is inescapable that the breaking of a badly corroded lifeline which the son was leaning against was the primary cause of the casualty. Contributory causes of the apparent drowning of the son were the heavy apparel, especially the rubber hip boots he was wearing, and the difficulty the father had in maneuvering the boat after the son had fallen overboard—caused by the extended fishing gear.

This casualty proves that a lifeline, to warrant that title, must protect lives. This one failed to do that because it was allowed to corrode. Lifelines should be periodically inspected and properly maintained to live up to their name.

EXPENSIVE HANDLING COSTS

REPORTS OF INJURIES to personnel using their hands instead of their heads continue to be received by the Naval Safety Center. Violation of standard operating procedures is considered the primary cause of these accidents. The following is a sampling of the reports received during the past months:

—A man received third-degree burns while feeling for a steam leak with his hand.

—Another man amputated the tip of his index finger when he placed his hand inside the spout of an ice cream maker to determine if the machine was jammed.

—A sailor was pushing stock into a jointer with his left hand instead of a pushblock when the stock was kicked back and the jointer blade amputated two fingers.

—When a man attempted to start a compressor motor by pulling on the pulley belt, the motor started as planned but too soon for the man to get his hand out of the way. One finger, caught between the pulley and belt, was amputated.

—When a man did not hear a vegetable chopper running because of ambient noise, he reached inside to clean it and sustained deep lacerations and fractures to two fingers.

—While using a commercial rust remover, a man disregarded the instructions to avoid skin contact and allowed the solution to come in contact with his hand. A severe chemical burn resulted.

—Another man placed his finger in a bolt hole to aline two flanges. The chain fall holding one flange slipped causing his finger to be amputated.

—And still another case occurred when a watchstander in the after steering compartment inserted his finger in the changepin hole of the trickwheel control lever. His finger was amputated when the rudder was moved.

Most human beings are fortunately born with two arms, two hands and 10 fingers. Needless accidents which cost even a small part of one finger reduce a man's dexterity. Such accidents, however, can be prevented by a little commonsense and forethought. Next time you are confronted with a situation which could prove "hand hazardous," put your brain in gear before you put your hands in motion—use your *two* eyes and *one* brain to *see* and *deal correctly* with ALL hazards. ⚓

—Courtesy, Fathom, Naval Safety Center

maritime sidelights

Radar Observer Endorsement

The Federal Register of December 30, 1970, published certain new regulations regarding endorsement of licenses for Radar Observer. The effect of these regulations is that on or after July 1, 1972, each applicant for an original endorsement as Radar Observer and each applicant for renewal of a license endorsed for Radar Observer must satisfy expanded requirements for that endorsement. In addition, the deck officers on a vessel of 300 gross tons and over which is issued a certificate of inspection for navigation on any waters must be qualified as Radar Observers; and every applicant for an original license, raise of grade, or increase in scope of license for service on vessels of 300 gross tons and over is required to demonstrate his qualifications as a Radar Observer.

Applicants may qualify for an original endorsement as Radar Observer or for renewal of a license endorsed for Radar Observer by: (1) Successfully completing an appropriate examination at the office of an Officer in Charge, Marine Inspection; or (2) successful completion of the appropriate approved course at one of the Maritime Administration Radar Schools located in New York, New Orleans, or San Francisco.

The MARAD schools offer approved courses which qualify the applicant as follows:

1. Eight-day course—original endorsement as Radar Observer (no limitation as to route).
2. Five-day course—original endorsement as Radar Observer—inland waters.
3. Four-hour course—qualifies applicants to renew licenses already endorsed for Radar Observer.

Successful completion of the MARAD 4-hour renewal course or the appropriate Coast Guard examination will allow the applicant to renew his license at any time within

Capt. Christopher G. Christakos, American Export Isbrandtsen Lines works on a radar simulator as C. R. Shanholtzer, Chief Radar Instructor at the Maritime Administration's Radar Simulator School, Seaman's Church Institute looks on. Captain Christakos was the first graduate of the Radar Simulator School. His successful completion of the course qualifies him to renew the endorsement on his license for Radar Observer.

Capt. Thomas A. King (*right*), Eastern Region Director, Maritime Administration, presents a certificate signifying successful completion of the course of instruction of the Radar Simulator School to Captain Christakos. Comdr. J. F. Ellis (*left*), Senior Inspector, Personnel at the New York Marine Inspection Office looks on.

the following 12-month period.

Those persons affected by the new regulations (46 CFR 10.02–9(e)(4), (5), and (6), 10.05–46, and 157.20–32 and–40) are strongly urged to attend one of the approved schools in order to reap the benefits of formal, expert instruction in the proper use and interpretation of radar information. Information concerning class quotas and schedules may be obtained by contacting the desired Maritime Administration Radar Observer School at one of the following addreseses:

15 State Street
New York, N.Y. 10006

450 Golden Gate Avenue
Box 36073
San Francisco, Calif. 94102

Room 14040
New Federal Building
701 Loyola Avenue
New Orleans, La. 70150

All candidates for a renewed or original endorsement as Radar Observer are advised to review H.O. Pub. No. 1310, the standard reference used in preparing Coast Guard examinations.

Training Films

Merchant vessel operators and seamen's organizations wishing to obtain training films showing the operation of the inflatable liferafts used on U.S. merchant vessels should contact the following raft manufacturers:

C. J. Hendry Co.
139 Townsend St.
San Francisco, Calif. 94107

Switlik Parachute Co., Inc.
1325 East State St.
Trenton, N.J. 08607

The films produced by the above companies are 16 mm. in size, with sound and color, and running times of 15 to 20 minutes. Both companies will arrange to loan copies to training directors for their evaluation.

Recent Ship Structure Committee Reports

The Ship Structure Committee is an interagency advisory committee which recommends research in ship structural design and materials which is of interest to its member agencies; the Naval Ship Systems Command, the Military Sealift Command, the Maritime Administration, the American Bureau of Shipping, and the U.S. Coast Guard. The Chief of the Office of Merchant Marine Safety of the U.S. Coast Guard serves as chairman of the committee. Results of the research are published as SSC reports which are available from the National Technical Information Service, Springfield, Va. 22151, at a nominal charge.

Recently published SSC reports include:

SSC–213, A guide for Ultrasonic Testing and Evaluation of Weld Flaws by R. A. Youshaw. 1970. AD 713202.

SSC–214, Ship Response Instrumentation Aboard the Container Vessel "SS BOSTON": Results From Two Operational Seasons in North Atlantic Service by J. Q. Cragin. 1970. AD 712187.

SSC–215, A Guide for the Synthesis of Ship Structures Part One—The Midship Hold of a Transversely Framed Dry Cargo Ship by Manley St. Denis. 1970. AD 717357.

SSC–216 (To be published in the near future).

SSC–217, Compressive Strength of Ship Hull Girders—Part I—Unstiffened Plates by H. Becker, R. Goldman, and J. Pozerycki. 1971. AD 717590.

SSC–218, Design Considerations for Aluminum Hull Structures: Study of Aluminum Bulk Carrier by C. J. Altenburg and R. J. Scott. 1971. AD 729021.

SSC–219, Crack Propagation and Arrest in Ship and Other Steels by G. T. Hahn, R. C. Hoagland, P. N. Mincer, A. R. Rosenfield, and M. Sarrate. 1971. AD 731674.

SSC–220, A Limited Survey of Ship Structural Damage by S. Hawkins, G. H. Levine, and R. Taggart. 1971. AD 733085.

SSC–221, Response of the Delta Test to Specimen Variables by L. J. McGeady. 1971. AD 733086.

SSC–222, Catamarans—Technological Limits to Size and Appraisal of Structural Design Information and Procedures by N. M. Maniar and W. P. Chiang. 1971. AD 733811.

SSC–223, Compressive Strength of Ship Hull Girders—Part II—Stiffened Plates by H. Becker, A. Colao, R. Goldman, and J. Pozerycki. 1971. AD 735113.

SSC–224, Feasibility Study of Glass Reinforced Plastic Cargo Ship by R. Scott and J. Sommella. 1971. ⚓

Why Not Pollute?

(*Continued from page 91*)

into harmless products. The rate, however, at which marine life can perform this breakdown is limited. However, we are discovering that man is capable of exceeding the limit, especially in the relatively small part of the ocean in which he operates.

A low rate of pollution with organic material may be tolerable, then, but every effort must be made to minimize the rate of pollution so that it does not overpower the biologic and chemical systems of the ocean. Some pollution is inevitable if men are to use the sea; it becomes dangerous when it exceeds the ability of the sea to handle it. ⚓

GALLEY SAFETY

GENERAL

1. The greatest accident hazards in your work are cuts, burns, slips, and strains. A high percentage of shipboard accidents happen to the galley staff, and very often, they are caused by someone neglecting to correct a work hazard or the injured person did not work safely. Get First Aid promptly for every injury, even a minor one; neglect may have serious consequences.

2. All members of the galley department should be properly oriented and trained in the use and safe operation of all galley equipment, including fire extinguishers. Horseplay is extremely dangerous in the galley; it is expressly prohibited.

HAZARDOUS CONDITIONS

1. *Damaged Utensils.*—Galley utensils become damaged after hard use and develop sharp corners or edges, which may cause painful cuts. Inspect the utensils frequently and repair those that may cause injuries.

2. *Meat Slicers.*—Meat slicers usually cause the worst cuts in the galley. Slicers should be protected at the point of contact, and where possible, fed automatically.

3. *Knives and Hand Tools.*—Racks, conveniently placed near the point of use, should be used to store knives, cleavers, forks, and hand tools.

4. *Floors.*—Spilled water or grease, and food particles, are serious accident hazards. Wipe them up promptly; or if during rush hours, sprinkle salt over the slippery areas.

HAZARDOUS WORK PRACTICES

1. *Leaving Sharp Tools on Chopping Blocks and Tables.*—Be sure to put them back in their proper racks.

2. *Using Fingers in Meat Grinder.*—Use a wooden tamp, not fingers, when pushing meat down to the cutting worm.

3. *Leaving Utensil Handles Hanging Over the Edge of the Galley Range.*—This is a frequent cause of scalds and grease burns.

4. *Lifting Kettle Lids Improperly.*—Lift the farther edge first to prevent the steam from clouding up to the face.

5. *Spilling Hot Liquids.*—Get help with heavy utensils. Keep the liquid down to a reasonable level in the kettle, and make a great allowance during rough seas. Use pads or folded towels when handles are hot.

6. *Mopping Floors.*—Keep the level of water down in the pail to avoid spillage and to avoid having the pail too heavy to lift easily. Do not stand on a wet soapy part of the floor as you are mopping.

7. *French Fryer and Basket.*—Do not drop too much or too wet food into the basket to cause the oil to splash or overflow. Make sure the fryer is held stationary on the stove, and not subject to any vessel movement to cause spilling, splashing, or crashing onto the deck. Keep any shelf that may be above the container free of any object which could accidentally fall into the fryer and explode or cause other harm.

8. *Failing to Keep Clean.*—Wear clean whites; avoid any possible contamination of food.

9. *Rushing Around.*—Walk, don't run. Rushing causes accidents. A proper "Work Flow" in the galley and pantries will keep people out of each others way.

10. *Range: Its Hood and Vent System.*—Keep these frequently cleaned of any grease encrustations that would serve as fuel for an unwanted fire. Turn off the range when you are finished with it. If you have propane gas, know where the emergency shutoff is. If any "gas" oven goes out you first put out top burners and pilot light second, close emergency shutoff. Any open light, burning cigarette, etc., would explode gas from oven when door is opened.

PRECAUTIONARY MEASURES

1. Handle fragile glassware with caution.

2. Inspect glasses and other dishes to see that they are not cracked before placing them in the container for washing.

3. Sweep up broken dishes, glassware, and crockery with broom and dustpan—never use your hands.

4. Always test hot water before putting bare hands into it.

5. When cutting meats or vegetables, cut away from yourself.

6. Wear shoes with good soles, heels, and laces—never wear slippers or sandals in the galley, while working. Foam-rubber soles are generally dangerous on any wet surface and must not be worn.

7. Never try to make repairs to electric ranges, gas ranges, dish washing machines, steam tables, deep fryers, milk dispensers, coffee urns, and refrigeration units. Call the chief engineer or electrician for whichever appliance may be in need of attention.

8. Never allow boxes or crates to be used to stand on. A suitable platform should be provided. Never carry supplies in a manner that blocks your view ahead.

9. Be careful of doorway thresholds as you step over them onto the outside deck.

10. Know how to use your fire extinguisher. Keep it in prominent view; don't block it in or hang anything on it.

REFRIGERATORS

1. Galley personnel must use the door hooks on refrigerators when carrying stores in and out of them.

2. A routine ringing of the alarm bell, and checking of all door hasps and hooks should be carried out during each safety inspection, or oftener, by galley personnel.

3. All galley personnel should become familiar with, and be drilled in, the operation of the inside alarm.

4. If doorway threshold is high, watch your step. ‡

Courtesy National Safety Council

Title 46 Changes

Chapter I—Coast Guard, Department of Transportation

TANK VESSELS AND SMALL PASSENGER VESSELS; GENERAL REQUIREMENTS FOR ELECTRICAL SYSTEMS

The purpose of these amendments to the electrical systems regulations is to define the term "nonsparking fan," to standardize common terms, to update the definitions of the insulation classes, to eliminate the general term of "approved equipment" for motion pictures equipment and insert the specific requirements, to allow the installation of impressed cathodic protection systems in grade E cargo tanks, to designate the cargo deck of tank ships as a hazardous area, to prescribe a suitable alarm bell for certain barges, and to allow specific commercial cable for electrical systems of more than 50 volts on small passenger vessels.

These amendments were proposed in a notice of proposed rulemaking published in the Federal Register of February 24, 1971 (36 F.R. 3425), and in the Merchant Marine Council Public Hearing Agenda dated March 29, 1971 (CG–249). The proposed amendments in this document were identified as Item PH 5–71 (PH 5a–71 through PH 5g–71) in the notice and agenda.

A public hearing was held on March 29, 1971, in Washington, D.C. Interested persons were given the opportunity to submit written comments both before and at the public hearing and to make oral comments concerning all the proposed amendments at the public hearing.

Item PH 5a–71 proposed amendments to §§ 110.15–175, 111.05–5, 111.15–10, and table 112.05–5(a) and received four comments. One comment suggested that the requirements for a nonsparking fan be a subchapter T requirement. The Coast Guard determined that the problem that the amendment corrected is not a problem for small passenger vessels. Accordingly, there is no need, at this time, for a similar amendment to subchapter T.

A comment suggested that § 111.15–10(f) be further amended by adding requirements for control switches for power ventilation in all rooms, lockers, and boxes containing storage batteries. The Coast Guard could not make the recommended change because of the prohibition in § 111.15–5(a) against control switches in battery rooms.

Another comment suggested that a sentence should be added to the proposed amendment to § 110.15–175 that would allow fan blades of aluminum or magnesium alloy and a ferrous housing with a nonferrous insert ring at the throat. The Coast Guard accepted the suggestion and made it subdivision (5) of the design characteristics. The last comment objected to the proposed change to § 111.10–1(b)(3) on the basis that an emergency generator is large enough to maintain safety requirements and engineroom auxiliaries needed to restart the boilers. The Coast Guard determined that this comment is not accurate since there is no requirement that an emergency generator be large enough to maintain engineroom auxiliaries needed to restart the boiler.

Item PH 5b–71 proposed amendments to § 111.05–30 and received two comments. One comment suggested that the word "experience" be deleted from the proposed amendments. The Coast Guard determined that the proposed amendments are adoptions of accepted standards of the National Electrical Manufacturers Association, and deviation from the language of these standards would result in unwarranted confusion for the technician. The second comment suggested that class "F" insulation be included in the proposed change to § 111.05–30. Section 111.05–30(b) of the proposal included class F insulation and it is in this amendment.

Item PH 5c–71 proposed amendments to § 111.65–15 and received two comments. One comment suggested that the phrase "or any other acceptable testing agency" be added to the proposed amendment to § 111.80–30(b)(1). Since the only testing laboratory for motor-driven projectors is named in the proposed change, the Coast Guard rejected the suggestion. The second comment pointed out a typographical error.

Item PH 5d–71 proposed amendments to § 111.85–10 and received two comments. One comment concerned a typographical error. The second comment suggested that the proposed amendment to § 111.85–10(b)(2) be deleted because the installation, without restriction, of impressed cathodic protection systems and submergible pumps in grade E cargo tanks would introduce a hazard. The Coast Guard determined that no hazard would be created because the impressed cathodic protection system and submergible pumps do not introduce sufficient energy to ignite the vapors from grade E cargo.

Item PH 5e–71 proposed amendments to §§ 32.45–1 and 111.85–10 and received 10 comments. Nine comments were concerned that the proposal could not be practically implemented aboard a tank barge. The Coast Guard determined that the requirements for the amendment should be made applicable only to tank ships. The last comment proposed an entirely new requirement and the Coast Guard decided that this suggestion could not be acted upon without public rulemaking procedures.

PH 5f–71 proposed amendments to § 113.25–30 and received one comment which concerned an editorial change. The Coast Guard accepted the suggestion and made the editorial change.

Item PH 5g–71 proposed amendments to § 183.10–20 and received four comments, all concerning editorial changes. In consideration of the suggestions, the words "approved for wet or damp locations" were added to § 183.10–20(a) by the Coast Guard.

Accordingly, item PH 5–71 is adopted with the following additional changes:

1. The proposed § 32.45–1(h)(2)(i) subdivided into subdivision (i)(*a*) for a clear delineation of the requirements for all tank vessels and for tank ships contracted for after July 1, 1972. The proposed § 111.85–10(c), which is similar to § 32.45–1(h)(2)(1), is subdivided into subparagraph (5) and subdivision (i) for the same reason.

2. The proposed § 111.05–30 is clarified by the addition of the definitions of the words "experience" and "accepted test." Also, the words "or combinations of materials" are added to follow the words "typical materials used" and the word "accepted" replaces the words "industry recognized" for consonance with the NEMA publication No. MG 1.

3. The proposed § 111.15–10(b) is subdivided into subparagraphs (1)(i) and (2)(i) and (ii) for the clear delineation of the requirements for battery rooms which contain large battery banks and the requirements for all other battery rooms.

4. The proposed § 111.15–10(f) is subdivided into subparagraphs (1) through (4) so that the reader may quickly ascertain the power ventilation requirements.

5. The words "The only restriction for electrical installations in cargo handling rooms and enclosed spaces is that" are omitted from the proposed § 111.85–10(d)(1) because they are unnecessary and redundant to the requirement.

6. The proposed § 183.10–20(a) is subdivided into subparagraphs (1), (2), and (3) to delineate the additional requirements for wiring and cable.

7. The proposed § 183.10–20(b) is subdivided into: subparagraphs (1)(i) through (v) to delineate the requirements for the installation of electric cable in damp or wet locations; subparagraphs (2)(i) and (ii) to delineate the requirements for the armor of cable subject to salt water; and (3) for the separate requirement for the sheath of mineral insulated metal sheathed cable.

8. The proposed § 183.10–20(c) is subdivided into subparagraphs (1), (2), and (3) to highlight the separate requirements for electric lighting and power cable, commercial cable, and Navy cable.

9. The proposed Table 183.10–20(c)(2) is footnoted that it is extracted from the National Electric Code.

Effective date. These amendments shall become effective on June 1, 1972.

The complete text of these changes was published in the "Federal Register" of March 8, 1972.

Chapter I—Coast Guard, Department of Transportation

DAVITS AND LAUNCHING DEVICES

The purpose of these amendments to the Coast Guard regulations is to: (a) Establish a service use life of 3 years for self-activating smoke signals; (b) require additional life preservers that are accessibly stored for personnel on watch in the engineroom, pilothouse, and at the bow lookout station; and (c) provide that all vessels have lifeboat/liferaft emergency illumination.

These amendments were proposed in a notice of proposed rulemaking published in the Federal Register of February 24, 1971 (36 F.R. 3425), and in the Merchant Marine Council Public Hearing Agenda dated March 29, 1971 (CG–249). The proposed amendments in this document were identified as item PH 7–71 (PH 7a–71 through PH 7c–71).

A public hearing was held on March 29, 1971, in Washington, D.C. Interested persons were given the opportunity to submit written comments both before and at the public hearing and to make oral comments concerning all the proposed amendments at the public hearing.

Item PH 7a–71 proposed amendments to §§ 33.40–1(c), 75.43–5(c), 94.43–5(c), and 192.43–10(c) and received two comments. One comment suggested that § 75.43–10(c) be amended by requiring the water light to be attached to a bracket. The Coast Guard determined that the suggestion was not responsive to the proposal and would require notice and public procedure thereon before any action could be taken; therefore; the Coast Guard determined not to act on the suggestion at this time.

The second comment requested that the service use of the self-activating smoke signal be extended from 3 years to 4 years. The specification for the smoke signal has always provided for a 3-year service use and the Coast Guard has not been apprised of a sufficient technical reason to extend this use upon its inclusion in the regulations. Accordingly, the Coast Guard has rejected this suggestion. Item PH 7a–71 has been adopted with no substantive change, but the form has been changed to facilitate reader understanding and reference.

Item PH 7b–71 proposed amendments to §§ 75.40–10 and 75.40–15 and received no comments. The Coast Guard adopted the proposed amendments with the following minor editorial changes: (a) The phrase "that is stowed in accordance with § 75.40–15(c)" has been added to § 75.40–10(c) to provide a reference for the required stowage of life preservers; and (b) § 75.40–15(c) has been changed in form only to facilitate reader understanding and reference.

Item PH 7c–71 proposed amendments to §§ 33.20–1(c)(3), 75.50–10(a), 75.50–15(a), 94.50–10(a), 94.50–15(a), 112.15–1, and 112.15–

and received two comments. One comment suggested that the proposed amendment of § 75.50–15(a) be changed to include a requirement for "over the side" illumination. The Coast Guard determined that the proposed regulation does provide for "over the side" illumination by requiring that the entire process of the launch, from the stowed position of the liferaft until it is waterborne, be illuminated. The other comment suggested that the words "on an international voyage" be eliminated from §§ 192.50–10 and 192.50–15. The Coast Guard found merit in this suggestion but determined that the change would require separate rulemaking procedures since it was not included in the present proposal. The Coast Guard adopted the proposal designated item PH 7c–71 with minor editorial changes.

In consideration of the foregoing, chapter I of title 46, Code of Federal Regulations is amended as follows:

SUBCHAPTER D—TANK VESSELS

PART 33—LIFESAVING DEVICES

1. By revising § 33.20–1(c)(3) to read as follows:

§ 33.20–1 Davits and launching devices.—TB/ALL.

* * * * *

(c) * * *

(3) A tank vessel must have lights that illuminate the entire process of launching lifeboats and liferafts from their stowed position until they are waterborne. For detailed requirements of such illumination for tank vessels contracted for on or after November 19, 1955, see § 111.75–15(e) of this chapter.

* * * * *

2. By revising § 33.40–1(c) to read as follows:

§ 33.40–1 Ring life buoys and water lights, general requirements.—TB/ALL.

* * * * *

(c) A self-activating smoke signal—

(1) Must be approved in accordance with subpart 160.057 of this chapter; and

(2) May not be more than 3 years older than the stamped date of manufacture.

SUBCHAPTER H—PASSENGER VESSELS

PART 75—LIFESAVING EQUIPMENT

3. By adding paragraph (c) to § 75.40–10 to read as follows:

§ 75.40–10 Number and type required.

* * * * *

(c) In addition to the life preservers required by paragraphs (a) and (b) of this section, each person on watch in the engineroom, pilothouse, and at the bow lookout station must be provided with a Coast Guard approved life preserver that is stowed in accordance with § 75.40–15(c).

4. By amending § 75.40–15 by striking the words ", one of which shall be stowed near the bow" in paragraph (b) and adding paragraph (c) to read as follows:

§ 75.40–15 Distribution.

* * * * *

(c) The additional number of life preservers required by § 75.40–10 (c) must be stowed in locations that are accessible to each person on watch in the—

(1) Engineroom;

(2) Pilothouse; and

(3) Bow lookout station.

5. By revising § 75.43–5(c) to read as follows:

§ 75.43–5 General.

* * * * *

(c) A self-activating smoke signal—

(1) Must be approved in accordance with subpart 160.057 of this chapter; and

(2) May not be more than 3 years older than the stamped date of manufacture.

6. By revising § 75.50–10 to read as follows:

§ 75.50–10 Illumination for lifeboat launching operations.

A passenger vessel must have lights for the continuous illumination of lifeboats that are being launched and lifeboats that are in the water in the immediate vicinity of the vessel. For detailed requirements of the illumination, see § 111.75–15(e) of this chapter.

7. By revising § 75.50–15 to read as follows:

§ 75.50–15 Illumination for inflatable liferaft launching operations.

A passenger vessel that is equipped with Coast Guard approved launching devices must have lights that illuminate the entire process of the launch from the stowed position of the liferaft until it is waterborne. Other passenger vessels must have lights that illuminate the stowage position of liferafts. For detailed requirements of the illumination, see § 111.75–15(e) of this chapter.

SUBCHAPTER I—CARGO AND MISCELLANEOUS VESSELS

PART 94—LIFESAVING EQUIPMENT

8. By revising § 94.43–5(c) to read as follows:

§ 94.43–5 General.

* * * * *

(c) A self-activating smoke signal—

(1) Must be approved in accordance with subpart 160.057 of this chapter; and

(2) May not be more than 3 years older than the stamped date of manufacture.

* * * * *

9. By revising § 94.50–10 to read as follows:

§ 94.50–10 Illumination for lifeboat launching operations.

Each vessel subject to this subchapter must have lights for the continuous illumination of lifeboats that are being launched and lifeboats that are in the water in the immediate vicinity of the vessel. For detailed requirements of the illumination, see § 111.75–15(e) of this chapter.

10. By revising § 94.50–15 to read as follows:

§ 94.50–15 Illumination for liferaft stowage areas.

Each vessel subject to this subchapter must have lights for the continuous illumination of the stowage position of liferafts. For detailed re-

quirements of the illumination system, see § 111.75–15(e) of this chapter.

SUBCHAPTER J—ELECTRICAL ENGINEERING

PART 112—EMERGENCY LIGHTING AND POWER SYSTEM

11. By amended §112.15–1 by adding paragraph (n) to read as follows:

§ 112.15–1 Temporary emergency source loads.

* * * * *

(n) Lights must provide continuous illumination for—

(1) The launching gear of a lifeboat or a liferaft; and

(2) The entire process of launching a lifeboat or a liferaft from its stowed position until waterborne.

§ 112.15–5 [Amended]

12. By revoking paragraph (c) of § 112.15–5.

SUBCHAPTER U—OCEANOGRAPHIC VESSELS

PART 192—LIFESAVING EQUIPMENT

13. By revising § 192.43–5(c) to read as follows:

§ 192.43–5 General.

* * * * *

(c) A self-activating smoke signal—

(1) Must be approved in accordance with subpart 160.057 of this chapter; and

(2) May not be more than 3 years older than the stamped date of manufacture.

(R.S. 4405, as amended, R.S. 4462, as amended, R.S. 4488, as amended, R.S. 4491, as amended, sec. 6(b)(1), 80 Stat. 937; 46 U.S.C. 375, 416, 481, 489, 49 U.S.C. 1655(b)(1); 49 CFR 1.46(b))

Effective date. These amendments shall become effective on April 10, 1972.

Dated: March 2, 1972.

T. R. SARGENT,
Vice Adm., U.S. Coast Guard,
Acting Commandant.

[FR Doc.72–3594 Filed 3–8–72;8:53 am]

(Federal Register of March 9, 1972)

Chapter I—Coast Guard, Department of Transportation

REFERENCE SPECIFICATIONS, STANDARDS, AND CODES

Miscellaneous Amendments to Chapter

The purpose of these amendments to the engineering regulations is:

(1) To make editorial changes, primarily correcting errors that occurred in the 1968 revision of subchapter F (33 F.R. 18808);

(2) To reflect changes in adopted industry standards and specifications;

(3) To adopt additional standards;

(4) To reflect technological advances;

(5) To interpret current regulations; and

(6) To allow aluminum as a material for the fabrication of independent fuel tanks.

These amendments were proposed in a notice of proposed rulemaking published in the Federal Register of February 24, 1971 (36 F.R. 3425), and in the Merchant Marine Council public hearing agenda (CG–249) dated March 29, 1971. The proposed amendments in this document were identified as item PH 2–71.

The Merchant Marine Council held a public hearing on March 29, 1971, in Washington, D.C., on the amendments proposed in the notice. Interested persons were given the opportunity to submit written comments both before and at the public hearing and to make oral comments concerning all the proposed amendments at the public hearing.

Item PH 2–71 included two proposals: Item PH 2a–71 concerns miscellaneous changes to 46 CFR subchapters F, Q, and T; and item PH 2b–71 concerns the allowance by the Coast Guard of aluminum as a material for the fabrication of independent fuel tanks for gasoline and diesel fuel service.

Nineteen comments were received on item PH 2a–71. Three of these comments supported the proposals. One comment suggested that the words "physical properties" proposed in the amendments to footnotes 10 and 11 of table 56.60–1(a) be changed to "mechanical properties" to clarify the intent of the rule. This suggestion has been approved and the footnotes to the table have been changed in accordance with the suggestion.

One comment questioned the adoptions of ANSI B 31.7 for nuclear power piping as proposed on pages 30 through 33 of the Merchant Marine public hearing agenda (CG–249). This comment pointed out that the ASME's 1971 edition of the "Boiler and Pressure Vessel Code" will contain a new section III, "Nuclear Power Plant Components, Division 1, Metal Components" that includes nuclear piping. The requirements on piping in the new section III are adopted from ANSI B 31.7 with necessary modifications to make them consistent and compatible with the requirements of other components in the system. Since ASME is the sponsor of both ANSI B 31.7 and the "Boiler and Pressure Vessel Code," the commentator pointed out the probability of industry and governmental agency acceptance and use of the new section III. The Coast Guard determined that other government agencies, both Federal and State, intended to use the new section III and decided not to adopt B 31.7 at this time. Accordingly, the adoption of B 31.7 which appears on pages 30 through 33 of the Merchant Marine public hearing agenda (CG–249) dated March 29, 1971, is hereby withdrawn.

A comment suggested that since an accumulation of sediment near the bottom of a tank could disable the gage closure device required in the proposed § 58.50–10(a)(4)(iii), the fuel level gage should continue to be installed on the topmost part of the tank. The Coast Guard accepted the intent of this comment and changed § 58.50–10(a)(4)(iii) to permit liquid level gages to penetrate at a point that is more than 2 inches from the bottom of the tank.

A comment suggested that the des-

ignation "class A nuclear vessels" in the proposed amendment to § 162.001–2(a) be changed to "class 1 nuclear vessels" for consonance with the 1971 ASME Code. The Coast Guard accepted this comment and made the change in the rule.

A comment pointed out that according to item 70–198 in the minutes of the Boiler and Pressure Vessel Committee, form P–1 (Flow Test Report) will be eliminated on January 1, 1972. It was suggested that the Coast Guard reflect this deletion in the proposed § 162.002–6(e). The Coast Guard accepted this suggestion and changed the words "or by submitting a copy of flow test report ASME Form P–1" to "or in the form of a copy of the capacity test data report" in § 162.002–6(c).

A comment suggested that the words "but is below 375° F." should be added to the proposed § 56.01–10 (c) (1) (xiii). It was pointed out that the addition would be consonant with § 56.50–15(h) and would complete the temperature limitation for easy reference by a designer. The Coast Guard accepted the suggestion and changed § 56.01–10(c) (1) (xiii) to read as follows: "Hot water heating systems where the temperature is greater than 250° F, but is less than 375° F."

One comment stated that the proposed amendment to § 56.50–15(b) could be interpreted as permitting the piping to be designed to a lesser specification. The commentator proposed that the amendment be changed to reflect the wurding of article PG 58.1.2.2 in section I of the ASME Boiler and Pressure Vessel Code. The Coast Guard accepted the comment and changed the first sentence of § 56.50–15(b) to read as follows: "Main superheater outlet piping systems, desuperheater piping systems and other auxiliary superheated piping systems led directly from the boiler superheater shall be designed for a pressure not less than the pressure at which the superheater safety valve is set."

A comment disagreed with the proposed amendment to § 56.50–15(i) (2). The commentator objected to the requirement of a back pressure trip device on the basis that it is an added source for propulsion failure during critical maneuvering periods and it may be difficult to test during periodic inspections. The Coast Guard recognizes that the alternatives to a simple relief valve add complexity to the machinery but does not accept this as a sufficient basis for rejection. The Coast Guard determined that the required device provides necessary protection. Accordingly, the Coast Guard did not approve the suggestion made in the comment for the deletion of the back pressure trip device. However, one change was made to § 56.50–15(i) (2) in accordance with a suggestion by a second commentator. In order to provide the proper protection, the Coast Guard changed the requirement that the back pressure trip device must close the inlet valve when the exhaust side pressure exceeds the maximum allowable pressure to require the closure prior to when the exhaust side pressure exceeds the maximum allowable pressure.

Three comments pertaining to the proposed amendments to § 56.50–105 (a) (5) suggested relaxations of the requirements for the materials and fabrication methods for low-temperature piping. The Coast Guard considered the proposed regulation to accommodate all appropriate portions of the suggestions and approved the regulation with only minor editorial changes.

One comment concerning the proposed § 162.002–5 stated that the use of three-fourths of an inch as a minimum safety valve size for unfired steam generators and auxiliary boilers is not adequate. This opinion was made without supporting evidence. The Coast Guard determined that the minimum size was supportable and rejected the suggestion. The proposed regulation was adopted but the form was changed to promote reader understanding and facilitate reference.

The remainder of the comments concerned minor editorial changes, primarily typographical errors, which were accepted.

Item PH 2b–71 received five comments. One comment supported the proposal. Three comments opposed the change on the basis that aluminum is a poor material for the transportation of oil and other hazardous cargoes. One comment called attention to a missing caption. The comments in opposition to the proposal were not based on current information on metallurgy and structural design. Accordingly, the amendment is adopted.

Effective date. These amendments shall become effective on April 28, 1972.

The complete text of these changes was published in the "Federal Register" of March 25, 1972.

Title 33 Changes

Chapter I—Coast Guard Department of Transportation

MISCELLANEOUS AMENDMENTS TO CHAPTER

The purpose of these amendments to chapter I of title 33, Code of Federal Regulations is to correct regulations which do not reflect the transfer of the Coast Guard to the Department of Transportation by the Department of Transportation Act (80 Stat. 931; 49 U.S.C. 1651). In addition, subchapter M is amended to delete the names of Coast Guard vessels that have been decommissioned or that now comply with the International Regulations for Preventing Collisions at Sea (33 U.S.C. 1051–1094) and to add the names of Coast Guard vessels not previously listed that are exempted from the International Regulations.

The amendments in this document consist of the following:

(a) The notes preceding parts 80 and 95 are deleted because they concern the Coast Guard's functions under the Department of Treasury and are no longer valid.

(b) Authority citations in parts 80, 82, 84, 85, 86, 90, 91, 92, 95, 96, 100, 135, and 136 are revised to reflect the Coast Guard transfer to the Department of Transportation by the Department of Transportation Act and the delegations by the Secretary of Transportation to the Commandant of the Coast Guard.

(c) Sections 85.01–5, 86.01–5, 91.01–5, 96.01–5, 135.05, and 136.05 are deleted because they concern the Coast Guard's functions under the Department of Treasury and are no longer valid.

(d) Sections 135.25(b) and 135.45 (b) are amended to correct vessels' designations.

(e) Sections 135.25(c) and 135.40 (b) are amended to delete the names of decommissioned Coast Guard vessels and add the names of Coast Guard vessels not previously listed that are exempted from the International Regulations.

(f) Section 135.50(f) is added to list Coast Guard Icebreakers on the Great Lakes that carry a forward masthead light and after range light with a horizontal separation of 23 feet.

Since most of these amendments correct regulations and authority citations made ineffective by changes in law, notice of proposed rulemaking is unnecessary and they may be made effective in less than 30 days. Since the remaining regulations concern Coast Guard vessels and are matters concerning agency management, they are exempted from rulemaking procedures by 5 U.S.C. 553 and also may be made effective in less than 30 days.

Effective date. This amendment shall become effective on March 16, 1972.

The complete text of these changes was published in the "Federal Register" of March 15, 1972.

Approved Equipment

Commandant Issues Equipment Approvals; Terminates Others

U.S. Coast Guard approval was granted to certain items of lifesaving, and other miscellaneous equipment and materials. At the same time the Coast Guard terminated certain items of lifesaving, and other miscellaneous equipment and materials.

Those interested in these approvals and terminations should consult the Federal Registers of March 3, 9, and 14, 1972, for detailed itemization and identification.

AFFIDAVITS

The following affidavits have recently been accepted:

*McDonnell & Miller, Inc.**, 3500 North Spaulding Avenue, Chicago, Ill. 60618, VALVES. *Models FS1, FS4, FS7, and FS8 Series Flow Switches and 25AN Float Operated Valve only.

Goddard Valve Corp., 705 Plantation Street, Worcester, Mass. 01605, VALVES.

*Plastic Lines Pipe**, Dow Chemical, U.S.A., Building B–1201, Freeport, Tex. 77541, VALVES, FITTINGS, FLANGES. *The expansion joints, sight flows, reducing spacers, and taper spacers are not approved. Pipe to be used for potable water shall be approved by the National Sanitation Foundation Laboratory, Inc.

*Zidell Explorations, Inc.**, 3121 Southwest Moody Ave., Portland, Oreg. 97201, VALVES. *Valves have "Duoseal" on information tag.

Larkin Division, Jay Oil Tools, Post Office Box 638, Waxahachie, Tex. 74165, FITTINGS.

The following affidavit has been changed as follows:

*Mesco Heat Exchangers Div.**, Marine Engine Specialties Corp., 590 Belleville Turnpike, Kearny, N.J. 07032, FITTINGS. *Boiler Water Sample Coder, Type 14–1 only, is changed to:

*Mesco Heat Exchangers Division**, Mesco Tectronics, Inc., 5 Central Avenue, Clifton, N.J. 07011, FITTINGS. *Boiler Water Sample Coder, Type 14–1 only.

FUSIBLE PLUGS

The regulations prescribed in "Subpart 162.014, Subchapter Q Specifications," requires that manufacturers submit samples from each heat of fusible plugs for test prior to plugs manufactured from the heat being used on vessels subjected to inspection by the Coast Guard. A list of approved heats which have been tested and found acceptable is as follows:

The Lunkenheimer Co., Cincinnati, Ohio 45214. Heat Nos. 778 and 779. ⚓

ACCEPTABLE HYDRAULIC COMPONENTS

Manufacturer	Valve type	Identity	Maximum allowable working pressure
Barksdale, Division of DeLaval Turbine, 5125 Alcoa Ave., Los Angeles, Calif. 90058.	4-way selector valve (aluminum).	6143R3HO3-J	3,000
Do	do	6943S3HC3-MC-H	3,000
Do	do	6142R3HO3-N	3,000
Do	do	6142R3HC3-N	3,000
Do	do	6183S3H*3-J	3,000
Do	do	6184S3H*3-J	3,000

In addition to the above, Barksdale valve No. 6143R3HC3 (4-way aluminum selector valve) as now approved should be listed as 6143R3HC3–J (4-way aluminum selector valve) for 3,000 p.s.i. MAWP.

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, 1972 are now available from the Superintendent of Documents price: $3.75.

CG No.	TITLE OF PUBLICATION
101	Specimen Examination for Merchant Marine Deck Officers (7–1–63).
108	Rules and Regulations for Military Explosives and Hazardous Munitions (5–1–68). F.R. 6–7–68, 2–12–69, 10–29–69, 12–30–70, 3–20–71.
115	Marine Engineering Regulations (7–1–70) F.R. 12–30–70, 3–25–72.
123	Rules and Regulations for Tank Vessels (5–1–69) F.R. 10–29–69, 2–25–70, 6–17–70, 10–31–70, 12–30–70, 3–8–72, 3–9–72.
129	Proceedings of the Marine Safety 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, 4–3–71, 3–15–72.
172	Rules of the Road—Great Lakes (9–1–66). F.R. 2–18–67, 7–4–69, 8–4–70, 3–15–72.
174	A Manual for the Safe Handling of Inflammable and Combustible Liquids (3–2–64).
175	Manual for Lifeboatmen, Able Seamen, and Qualified Members of Engine Department (3–1–65).
176	Load Line Regulations (2–1–71) F.R. 10–1–71.
182	Specimen Examinations for Merchant Marine Engineer Licenses (7–1–63).
184	Rules of the Road—Western Rivers (9–1–66). F.R. 9–7–66, 2–18–67, 5–11–67, 12–23–67, 6–4–68, 11–29–69, 4–3–71, 3–15–72.
190	Equipment Lists (8–1–70). F.R. 8–15–70, 9–29–70, 9–24–71, 9–30–71, 10–7–71, 10–14–71, 10–19–71, 10–30–71, 11–3–71, 11–6–71, 11–10–71, 11–23–71, 12–2–71, 1–13–72, 1–20–72, 2–4–72, 2–19–72, 3–3–72, 3–9–72, 3–14–72.
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, 6–17–71, 12–8–71.
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, 1–20–71, 4–1–71, 8–24–71.
249	Marine Safety Council Public Hearing Agenda (Annually).
256	Rules and Regulations for Passenger Vessels (5–1–69). F.R. 10–29–69, 2–25–70, 4–30–70, 6–17–70, 10–31–70, 12–30–70, 3–9–72.
257	Rules and Regulations for Cargo and Miscellaneous Vessels (8–1–69). F.R. 10–29–69, 2–25–70, 4–22–70, 4–30–70, 6–17–70, 10–31–70, 12–30–70, 9–30–71, 3–9–72.
258	Rules and Regulations for Uninspected Vessels (5–1–70).
259	Electrical Engineering Regulations (6–1–71). F.R. 3–8–72, 3–9–72.
266	Rules and Regulations for Bulk Grain Cargoes (5–1–68). F.R. 12–4–69.
268	Rules and Regulations for Manning of Vessels (10–1–71). F.R. 1–13–72
293	Miscellaneous Electrical Equipment List (9–3–68).
320	Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf (11–1–68). F.R. 12–17–68, 10–29–69, 1–20–71, 8–24–71, 10–7–71.
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, 3–8–72, 3–14–72.
329	Fire Fighting Manual for Tank Vessels (7–1–68).

CHANGES PUBLISHED DURING MARCH 1972

The following have been modified by Federal Registers:
CG–115, Federal Register of March 25, 1972
CG–169, CG–172, and CG–184, Federal Register of March 15, 1972
CG–190, Federal Registers March 3, 9, and 14, 1972
CG–256 ,and CG–257, Federal Register of March 9, 1972
CG–259, Federal Registers of March 8 and 9, 1972
CG–323, Federal Registers of March 8 and 25, 1972


ALASKAN MAIL
PORT OF SEATTLE