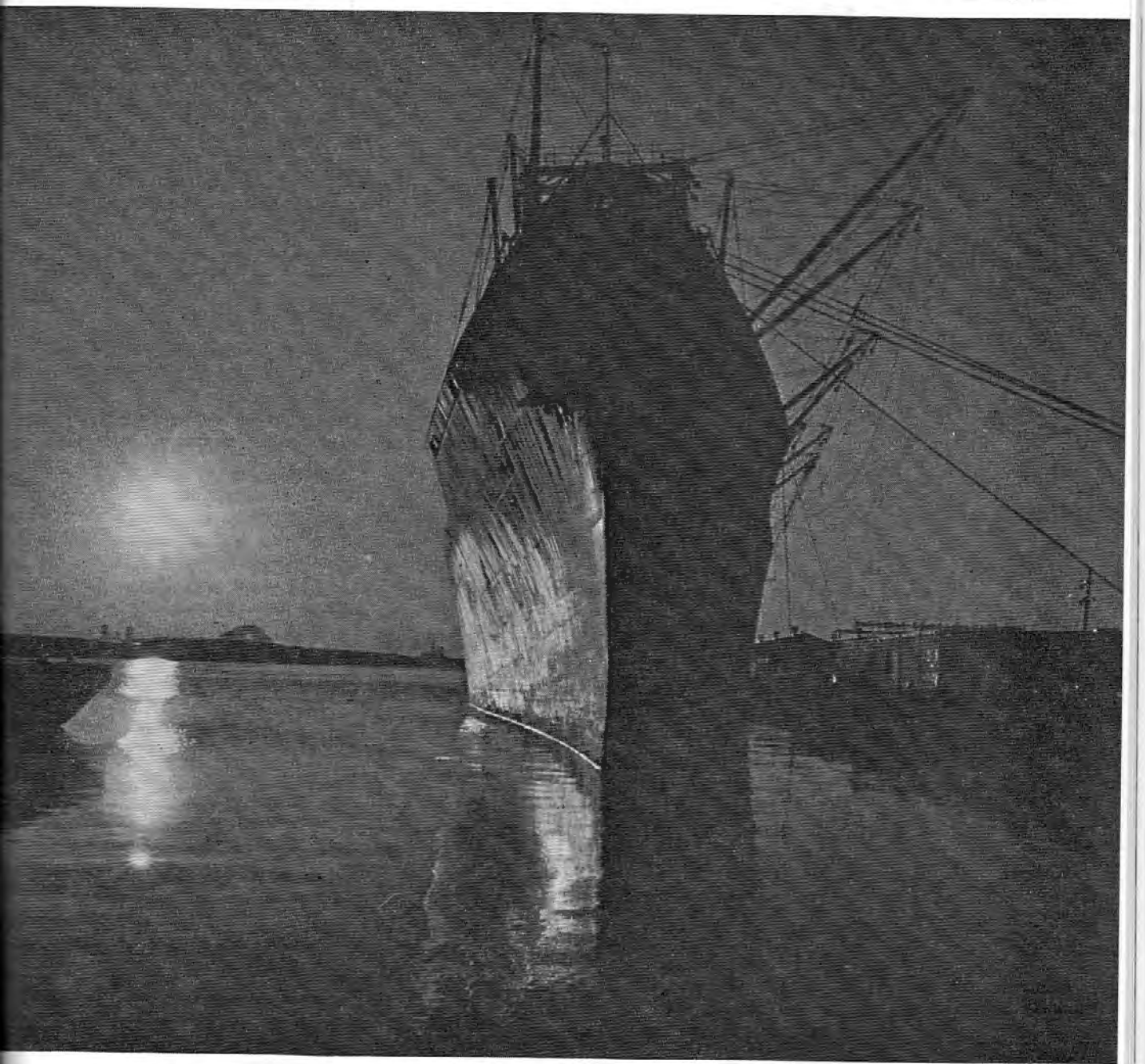
PROCEEDINGS
OF THE MARINE SAFETY COUNCIL



DEPARTMENT OF TRANSPORTATION UNITED STATES COAST GUARD

Vol. 29, No. 12 CG-129 December 1972

The Lifesaving Guns of David Lyle . . .

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COVERS

FRONT COVER: Courtesy *Dialogue III,* Insurance Company of North America. Larry Hamill, photographer.

BACK COVER: Evoking images of a church spire, the mast of the USS *Constellation* points to a cloud dappled sky and to something beyond man. The staff of the Marine Safety Council wishes you a safe and peaceful New Year. *Photograph courtesy of the Maryland Port Administration.*

Season's Greetings

As this year's voyage draws to an end, I offer you—the many readers of the Proceedings, both ashore and at sea—my very best wishes for happy holidays and calm seas in the coming year.

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

DIST. (SDL No. 95)
A: abcd(2);fhklmntuv
B: n(40);c(1);e(5);f(4);gh(3);r(2);bkijq(1)
C: gp(1)
D: i(5);adgklm(1)
E: None
F: kp(1)
Lists 141M, CG–13, CG–20

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

THE LIFESAVING GUNS OF DAVID LYLE

By J. P. Barnett [1]

The idea of throwing a weighted line to an otherwise inaccessible place is probably contemporary with the invention of rope itself. Surely the idea has occurred spontaneously to every schoolboy. The use of mechanical ordnance to cast lines prior to the invention of gunpowder would be more surprising in absence than in presence. Trebuchets and mangonels would appear readily adaptable to such application.

But the idea of attaching a line to a powder expelled projectile seems to have been first seriously considered by a Sergeant Bell, of the British Royal Artillery, in the late 18th Century. Sergeant Bell's idea was that a line so cast could be used to rescue persons stranded in shipwreck. With a hawser pulled out to the ship by the initial whipline, a breeches-buoy could be rigged to transport passengers and crew over the surf to safety.

Sergeant Bell demonstrated his idea in 1791. Using a mortar with a line attached to the shot, Bell succeeded in casting a line to a range of 400 yards, and proposed that British ships be fitted with similar mortars. Bell was promoted for his idea, but it was regarded as impractical. The mortar weighed 600 pounds, and the shot 60.

Several years later, after experimenting with lines cast with lighter pieces of ordnance, Captain G. W. Manby, also an Englishman, established that Bell's idea hadn't been altogether a harebrained notion. In 1809, Captain Manby rescued the crew of the shipwrecked brig *Nancy* with a line attached to a smaller projectile fired from a mortar much lighter than Bell's. Manby later died in poverty, with even a mortgage on his own tombstone, but between 1809 and the time of his death he did see lifesaving stations built along the British coasts as the result of his work.

With the idea of line rescue accepted, the search for better ways of effecting it began. In 1829, John Dennett, of the Isle of Wight, proposed that lines could be better carried by rockets. Using a modification of the 18th Century Congreve war rockets ("the rockets' red glare"), Dennett devised two line-carrying rockets: a single 9-pounder and a twin 12-pounder. The 9-pounder lacked range. The twin 12-pounder had range, but became the cause of immediate concern; if only one tube fired it tended to come right home. There were the advantages of portability and other factors in favor of rockets, but on the other hand, they were badly affected by moisture, tended to be erratic in flight, and contained a built-in fire hazard. Moreover they seem sometimes to have burst instead of flying.

The rest of the 19th Century became a contest mainly between rockets and mortars for dominance in the field of line rescue. Manby system mortars remained in use. Colonel R. A. Boxer, also English, developed a true two-stage rocket that combined the best features of both of Dennett's rockets. The French experimented with various devices, and settled on two types of mortars. In London, kites were manufactured for getting lines from ship to shore, on the theory that any wind that would drive a ship aground would also carry a kite to shore. Some rescues seem to have been effected with kites.

By 1875, various humane societies had established a loose network of lifesaving stations along our coasts, each using whatever line-carrying equipment appeared most satisfactory locally. But lifesaving crews were mostly volunteers. Training was generally poor, and mispractices and dereliction were not uncommon.

In 1875 the situation came under federal attention. In that year, the Treasury Department appointed Sumner I. Kimball to create a federal rescue service. In 1876, the U.S. Life-Saving Service was established.

The task of developing an improved system of projecting lines fell to a young American lieutenant, David A. Lyle, in 1877. Lyle was an 1869 West Point graduate. By 1877, he had been on arsenal duty in California, frontier duty in Alaska, and cavalry escort duty in Death Valley. At the time he was called to develop a line-carrying device, he was back at West Point, as a professor of experimental philosophy. Apparently without any advance appropriation of funds, his new project was to be carried out "in addition to his regular duties."

Lyle's objective was to develop a gun that would combine the portability of rockets with the dependability of mortars. Starting with "an old rifled howitzer, found among a lot of captured ordnance," Lyle first experimented with projectiles suggested

[1] Mr. Barnett is President of South Bend Replicas, Inc. His article is reprinted by his permission and by permission of the *Nautical Research Journal.*

by the Ordnance Board, slotted along one side so as to allow slipping the line down the bore alongside the projectile.

His first firing ground was in Springfield, Massachusetts, at what is now Van Horne Park, a city baseball field. The land was then under private ownership. Lyle obtained permission from city officials to use the land, provided that he posted guards on the road to Chicopee, which bisected the range, prior to each shot. Firing from the vicinity of what is now 314 Chapin Terrace, Lyle was able to establish a sufficient plane of fire.

A few shots with the rifled howitzer, which had been sawed off about five inches ahead of the trunnions to lighten it, established to Lyle's satisfaction that neither the slotted projectile nor the rifling were the way to go. Loading was either painstaking or inefficient. The spinning imparted to the projectile snarled the lines. The flight of the projectile itself was erratic.

Captain Manby's mortar projectile had been essentially a mortar ball with a plaited hide leader attached. The leader was to prevent scorching the rope by the blast of expulsion. Drawing on Manby's idea, Lyle began experimenting with projectiles employing an iron shank in place of the hide leader.

One of the arguments that favored rockets over mortars was that mortars, being fired at high elevation, consumed great quantities of line in order to reach fairly short distances. Rockets could be fired in a flatter trajectory. Since laying out the line prior to each shot was tedious, line consumption was important.

Lyle saw small howitzers, fired at rocket-angle elevation, as the answer. The heavy projectiles for Lyle's experimental guns took on a sash-weight-with-eyebolt configuration. Inserted into the muzzle with the shank of the eye protruding from the muzzle, the projectile turned 180 degrees on departure, taking the line along with it, trailing behind.

First at Springfield, and later at a government range at Sandy Hook, New Jersey with the permission of General S. V. Benet (father of S. V. Benet the poet), Lyle conducted extensive tests during the years of 1877 and 1878. Using bronze castings of his own design, poured under his supervision at the South Boston Iron Works, Lyle made three guns of similar configuration, bnt of different sizes. He named them Bronze Gun A, Bronze Gun B, and Bronze Gun C. The bores were of 3-inch, 2-inch, and 2½-inch diameter, respectively. The carriages were of simple iron-bound wood design. Since they were to be set in sand, they had no wheels. Bronze Gun C eventually became The Lyle Gun.

The designs themselves were audacious. An ordinary 2-pounder (2½" bore) with carriage could be expected to weigh upwards of a hundred times or more the weight of its loose-fitting round shot. Lyle's "sash-weight" projectile weighed 18 pounds. The whole gun weighed 163 pounds: NINE times the weight of the shot. Additionally, in the interest of efficiency, the shot was machined to a piston-like fit in the bore, instead of being a traditionally loose smoothbore fit. The combination of an extremely lightened gun, an inordinately heavy projectile, and the piston-like fit of the projectile, all tended to create sharply rising breech pressures, and uncommonly violent recoil.

All gunpowder then in use was black powder, a simple chemical mixture dating back to the Middle Ages in Europe, and earlier elsewhere, apparently. (Modern "smokeless" powders are sophisticated chemical compounds yielding infinitely greater pressures.) Of the grades of black powder available, Lyle chose one of the milder: Hazard's Navy Cannon Powder. With that mild powder, recoil was kept within reason, and pressures remained safe. The service range nf the gun came to be about 1200 feet. Later regulations set the test performance range at 1050 feet, to within 50 feet to the left or right of the point of aim.

Concurrently with Lyle's experiments, Robert P. Parrott, by then the Grand Old Man of American field ordnance, had developed and patented a mortar that he regarded as superior to both the Manby and the experimental Lyle systems. Edmund S. Hunt, of Massachusetts, had also developed a gun whose projectile carried a self-contained line which payed out in flight. Neither system seems to have compared favorably to Lyle's. Though 25 of the Parrott mortars were placed in service, they were later superceded by Lyle guns. After later improvements, some of Hunt's gun/projectile combinations seem to have come into use aboard ship.

Lyle made his recommendations in the fall of 1878. Lyle guns instantly went into production, and were distributed to all U.S. Life-Saving service stations. References to their use in rescues make their first dramatic appearance in the winter of 1879–80, when a storm reaching from Louisiana to Maine created a general shipping disaster. Lyle gun rescues of that winter, and especially that storm, read like Melville.

By 1890, the American Carrier Rocket Company, of New Bedford, had undertaken production of Cunningham line-carrying rockets employing self-contained lines, somewhat as per the Hunt gun system. Lyle guns also came to supersede those.

In 1889, Congress had passed an act requiring line-carrying devices to be placed aboard steamships. The shipmasters didn't want them. A fiery controversy arose. The Board of Supervising Inspectors of the Steamboat Inspection Service was caught in the middle of multisided arguments among rocketmakers, gunmakers, steamship owners, S. I. Kimball, Congress, and the Secretary of the Treasury. The board cited the opinion of no less than "The Honorable Sumner I. Kimball, whose judgement in such matters will not be questioned in any

part of the civilized world," to the effect that Lyle guns could not "be used, or carried on shipboard, without subjecting the passengers and crew to dangers not less appalling than shipwreck itself." But it set forth specifications for the construction of S.I.S.—approvable Lyle guns.

Under pressure from the steamboat lobby, Congress repealed the requirement in 1891, after which time placement aboard ship became voluntary, then customary, then required again around World War I.

The first major modification of Lyle guns came through the efforts of a young eastern inventor, Francis Grainger Hall, Jr. Fresh out of Yale with a degree in electrical engineering, Hall by 1902 had already invented the underwater arc light used in the raising of the *Maine*, and other marine-oriented contrivances. Taking on the problem of Lyle gun recoil Hall proposed placing the trunnions at the breech, rather than at the midpoint of the barrel, in order to change the center of gravity and direction of recoil thrust. It helped.

After Hall's patent expired in 1919, companies other than Hall's, which continued, leaped to produce the Hall system Lyle guns. A third major type of Lyle gun seems to have been first produced in 1913 by the Coston Signal Company, whose history in life-saving apparatus dates back to 1840.

Made entirely of cast steel, with trunnions at the midpoint of the barrel, the Coston gun consisted of two triangular sideplates held together with tiebolts, the barrel being suspended between the two plates, and elevated by means of a sliding pin passed through a connecting link at the breech.

Other makes and types, including a Hall breechloading Lyle gun, appeared during that time. Bronze Gun C was made on contract by several companies, apparently into the 1930s. Hall and Coston system Lyle guns were made variously by Galbraith, Kahweiler, McKeever-Daly, Heat Transfer Products, the New York Gun Company, Hawley Smith, Sculler (which was largely Hawley Smith), Reading, Star, Steward, Hilyard, and no doubt others not yet uncovered.

A particularly dramatic Lyle gun rescue took place in 1918, just above Horseshoe Falls. Gustaf Loftberg and James Harris were then members of a crew engaged in dredging operations on the Niagara River. The tug Hassayampa, towing their barge ran aground. A second tug pulled Hassayampa free. As the Hassayampa broke free, the towline to the barge snapped. The barge headed for the falls, with Loftberg and Harris aboard. Much concerned for their safety, the men opened the seacocks and, for what it was worth, threw out the small anchor.

Miraculously entering a rocky path instead of a full-flowing one a few feet to the left, the sinking barge ran aground, about 150 yards from the falls and about a hundred yards from the Canadian shore. Attempts to reach the men with a line fired from a small shoulder-fired line throwing gun (itself apparently a 1904 Hall invention) failed.

The Coast Guard at Fort Niagara had in the meantime been called. Arriving on the American side with Bronze Gun C, the gun was rushed across the bridge to the Canadian side, where wartime security reportedly caused a flurry of argument about charging across the border with a cannon.

Shortly, the gun was set up on the Canadian bank at a point nearest the barge. On the first shot, the projectile topped the barge, laying the line neatly across it, accessible to Loftberg and Harris. There was no mast to which a breechesbuoy could be rigged. The lines became snarled.

"Red" Hill, a Niagara resident whose rescues were to become area legend, at the time was home recovering from wounds and the effects of poison gas, in France. Hill crawled out onto the snarled lines and himself became entangled, dangling inches above the rapids. Working himself free, he finally got the lines operational. The rescue took all night. The next morning, 45 minutes apart, Loft-

(*Continued on page 257.*)

A COAST GUARD COMMENT ON LINE-THROWING APPLIANCES

The following regulations require that the vessels affected carry approved line-throwing appliances as a part of their safety equipment:

46 CFR 33.55, Subchapter D, Tank Vessels
46 CFR 75.45, Subchapter H, Passenger Vessels
46 CFR 94.45, Subchapter I, Cargo and Miscellaneous Vessels
46 CFR 192.45, Subchapter U, Oceanographic Vessels

Under these regulations, the Lyle Gun type appliances discussed in Mr. Barnett's historical article are no longer considered approved. Some few may still lawfully be in use, however, since those already in use in the early 1950's were permitted to fulfill the requirements of the cited regulations so long as they were kept in good and serviceable condition.

Coast Guard regulations generally allow the impulse-projected rocket type appliance (specifications for which are in 46 CFR 160.040 of Subchapter Q specifications) or the shoulder gun type (the requirements for which are contained in 46 CFR 160.031).

In addition to Coast Guard requirements, there exists Regulation 23 of the International Convention for Safety of Life at Sea, 1960 (SOLAS 60) governing the carriage of line-throwing appliances. The Coast Guard approved appliance which meets the convention is an impulse-projected rocket type appliance, and is carried by U.S. ships on international voyages.

The Coast Guard, in conjunction with the Army and the Navy, has conducted extensive tests on appliances and has approved the appliances of two manufactures for "International" Merchant Marine use. Smith & Wesson Chemical Co. and Kilgore Corporation both make approved appliances.

MARINE CASUALTIES AND SOME OF THE PRACTICAL ASPECTS OF MARINE BOARDS OF INVESTIGATION

By Capt. C. T. Newman, U.S. Coast Guard [1]

This article is designed to accomplish two things: first, to *inform* of the more practical aspects—regulatory, technical, and investigative—of the Coast Guard's Commercial Vessel Safety Program, and second, to impress upon you the extremely urgent, very real need for continued advances in all areas of maritime safety.

Let me begin the discussion of the Coast Guard's Commercial Vessel Safety Program by pointing out to you that it is a viable and, of necessity, changing program. Though some may tend to think that regulations and methods of administration of regulations pertaining to marine safety remain fairly static, I would point out to them that we in the safety business can no more afford to remain static than can our counterparts in the business of commercial shipping. As recent technological advances in a variety of industries have increased the need for vast quantities of bulk chemicals and other hazardous materials, shippers are meeting that need through water transportation.

Accompanying this growth in the amount of shipping is a corresponding increase in the potential for disaster. Our recognition of our responsibility in this area, the awareness of the public of the potential which exists for a marine casualty of catastrophic proportions and the recent occurrence of several serious casualties both at sea and on inland waters recently are factors stimulating changes in our programs. One incident, though not catasprophic in proportion, should illustrate the need for continued awareness and continued change.

The weekend of August 14, 1971, a cruise of eleven people in a pleasure boat ended fatally for seven of them as their cabin cruiser collided with a 1000 foot tow being pushed up the Ohio River. Though it was dark, the visibility was good; the cabin cruiser and its party were returning from a picnic along the river. The owner's 11-year-old son was operating the boat up until moments before the incident. Shortly after ten o'clock the master of the tow boat sighted the lights of the small boat at a distance he estimated at approximately one-third of a mile. Though the master felt that the headings of the two craft would allow them to pass safely, when their distance had decreased to two hundred feet the cabin cruiser appeared to veer sharply, crossing the head of the tow. Impact occurred moments later as the boat struck one of the lead barges and was driven underneath the tow. It distintegrated under water.

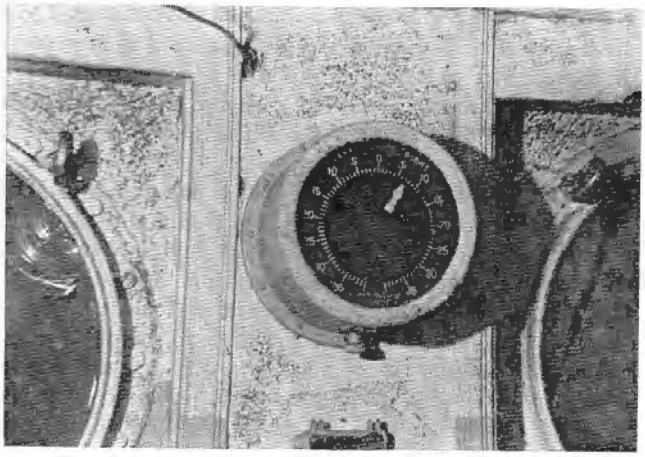
The boat owner was an average American, a family man, who worked for a living and who had always had an interest in boats. Some 18 years ago he owned a small 15-foot outboard boat for two summer seasons; about 10 years ago he owned a 17-foot outboard which he ran on weekends for a season. Last year he bought this 21-foot inboard cabin cruiser which, up until the incident which caused his death and that of his friends and part of his family, he had operated on the busy Ohio River for several hours on sunny weekends. He had never undergone any course of instruction nor had he enrolled in any of the many safety courses available to the public through the Coast Guard Auxiliary and the U.S. Power Squadrons.

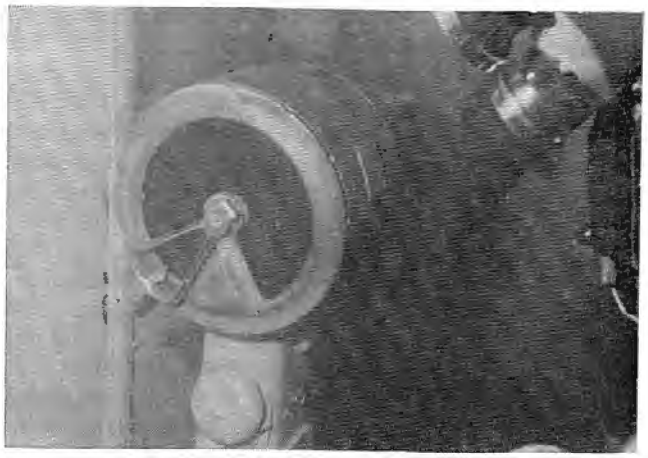
A cursory reading of the newspaper items which followed the incident indicated several obvious lessons, the major one being that ownership or a certificate of title to a boat does not automatically by some mysterious process convey the know-how and experience to safely operate a boat, especially on busy waterways at night.

The other important lesson to be learned from this casualty concerns the regulation making process. You see, the Marine Board of Investigation convened to study the disaster recommended that tows be required to carry a flashing amber warning light on the head of the tow. It is interesting to note that experiments with such a light had been conducted by the Coast Guard since 1969 and the response from industry and the public was favorable. Yet it took three years for regulations requiring such a light to get on the books. The lesson? We must continually make ourselves aware of safety needs and work hard to meet them.

At sea the need for change in safety programs is equally urgent. We have seen recent news reports that, on the average, one of 60,000 merchant ships sinks per day. The amount of the world's tonnage has nearly doubled in three years; American ports now handle more than one million vessels a year. The booming demand for oil has accelerated the rate of shipping and larger and faster

[1] From a speech delivered before the 1972 National Safety Congress and Exposition, Chicago, Illinois.





These photographs of the rudder angle indicator and the engine order telegraph of the *V. A. Fogg* were used by Coast Guard investigators in their efforts to determine the cause of the explosion that sent the tanker to the bottom during a gas freeing evolution last February.

tankers have both eased the energy shortage and increased the hazard of major ecological damage. By 1975 there will be more than 500 "supertankers" of more than 160,000 DW tons and we must now take steps to insure that these giants operate safely. Several laws have been passed in Congress recently which authorized the Coast Guard to take some definitive action to promote marine safety. The Ports and Waterways Act of 1972 provides the Coast Guard authority to establish, operate and maintain a vessel traffic system for ports and harbors and other waters subject to congested vessel traffic. The target date for the institution of mandatory systems varies from port to port; however, there are several such systems now functioning on a voluntary basis.

The Bridge-to-Bridge Radiotelephone Act requires many commercial vessels to be equipped with a communications capability which will allow masters and pilots to exchange navigational information in passing situations. Successful programs of this type in the Delaware Bay and River Systems have proved its advantages; with nationwide usage beginning the first of the year it is hoped that collisions on our navigable waters will be greatly reduced.

At the present time the Coast Guard is preparing regulations concerning the licensing of operators of uninspected towboats. Public hearings on the proposed regulations were held in September; the rules are now being rewritten in light of the many comments received around the country. The Coast Guard is also, as required by law, conducting an extensive study to determine if there is a need for licensed engineers on uninspected towboats.

You can see, then, that from the regulatory standpoint our Commercial Vessel Safety Program is moving ahead along many fronts. Our technical and investigative programs are advancing, also, and I would like to at this time explain to you how the Coast Guard's relatively new computerized marine information system works and how it is being utilized in Marine Boards of Investigation. This system was established in July 1971 as a staff component under the direction of RADM W. F. Rea, Chief of the Office of Merchant Marine Safety.

The function and objectives of this staff are:

a. To maintain and administer a program for the analysis of casualties involving commercial vessels.

b. To prepare and submit information of broad interest to the Marine industry.

c. Develop, maintain and administer a program for the implementation of an integrated management information system for the Commercial Vessel Safety Program.

d. Establish liaison with other government agencies and private associations for the purpose of information exchange.

The staff is still in the development stage and has not approached its potential, but there are useful functions which it can perform. They have produced several useful reports concerning suspected structural defects in vessels of certain classes. To date the bulk of the output has been for Coast Guard consumption. As we gain experience with the system and as it develops it is hoped that more of the output can be used to good advantage by the industry and other government agencies.

Here, then, is a tool developed from advances in computer technology. Let's see how this technological improvement is now being used in Coast Guard investigative activities.

Information derived from the system was used by the Office of Merchant Marine Safety in the marine casualty involving the loss of the S/S *Texaco Oklahoma* on 27 March 1971. This vessel, an oceangoing tanker, while on a voyage from the Gulf Coast to Boston, Massachusetts, with a cargo of black oil, encountered extremely heavy weather off Cape Hatteras and subsequently broke in two. The forward section which contained the naviga-

tion bridge drifted away and sank. The stern section remained afloat for about 27 hours. During this time the crew attempted to use the portable emergency lifeboat radio transmitter to communicate their plight. They also attempted to attract attention by means of visual and whistle signals. The sinking stern section was abandoned by the remaining crew using the 15 person inflatable liferaft and two makeshift rafts comprised of empty oil drums. Ten hours after the stern section sank eleven crewmen were rescued by another ship, and thirty-two hours after abandoning the stern section another two men were rescued by another ship of the same company. Total loss of life was thirty-one of the forty-four crew members.

In addition to the Marine Board of Investigation which was immediately convened by the Commandant to investigate and report on the loss of the vessel and part of its crew, the Chief of the Office of Merchant Marine Safety directed the marine information and analysis staff to identify ships of similar design so that they could be examined as soon as possible by a Coast Guard inspector. The inspectors were to look for faults in the vessels' structures which might be common to all vessels of the class and which in any way could be related to the casualty. The information system was to search the records looking for anything which could be casualty related. Fourteen vessels were identified as sister vessels though several were built in different shipyards and four were of a modified design. The inspections and searches of files and records were unproductive with regard to finding a common fault in the ships which could be considered as a possible contributory factor to the casualty. However, the effort produced some beneficial effects in that other problem areas of a broader nature were identified, and lots of useful information was at hand. It was clear that this information should be passed along to field inspection offices. A team was organized headed by an experienced inspector and the information obtained was condensed to a practical size and presented in seminar form to inspectors in those eight ports which handle inspections of large seagoing tankships. The field response to the program was so enthusiastic that the project will be repeated next year.

Ghostly reminder of a tragedy that claimed all hands on the *V. A. Fogg*, this ship's wheel was photographed by Coast Guard divers one hundred feet below the surface of the Gulf of Mexico.

The *Texaco Oklahoma* incident occurred in March of 1971, and Marine Board findings, the Commandant of the Coast Guard's action on the findings and recommendations, and the National Transportation Safety Board's action have been completed. The report of the casualty has been published and made available to the public.

Another casualty to a tankship which resulted in the loss of the vessel with loss of all persons on board provides us with yet another example of the growing use of the present technology to aid investigations. I am speaking now of the S/S *V. A. Fogg*, a 572 foot oceangoing jumboized T–2 tanker, which exploded and sank in 100 feet of water about 36 miles south of Galveston, Texas on 1 February 1972. All of the 39 persons known to have been on board at the time of the incident are dead or are missing and presumed dead. Since the report of the Marine Board of Investigation is still under review (by the Commandant or the National Transportation Safety Board) it would be inappropriate for me to comment upon the conclusions and recommendations contained in the report; however, some of the factual aspects will be commented on, mainly to give you an idea of some of the problems faced by a Board of Investigation which is charged with the task of finding out what happened, when, how and why it happened and what persons, if any, caused or contributed to the casualty by an act or omission. The *V. A. Fogg* had left Freeport, Texas at about 1330 on 1 February and was to proceed to sea, to wash and gas free her cargo tanks in preparation for her next cargo which was to be methanol, kerosene, and heating oil. Her previous cargo was benzene and except for 19,000 barrels of xylene in her No. 8 and 9 center tanks she was empty. The vessel was expected to return to the Galveston bar 12 hours or so after her departure from Freeport, but in any event, the master was expected to notify the operators of his expected time of arrival by radio telephone. The tankwashing and gasfreeing was to be done by the ship's crew assisted by five shore based laborers who were to wipe the tanks dry.

At about 1600 on the day the vessel left Freeport a NASA pilot on a test flight saw a huge mushroom shaped black cloud of smoke in the Gulf of Mexico about 50 miles south of the Galveston VORTAC. He contacted the Houston air controller but received no explanation as to the source of the cloud. However, a Coast Guard air search plane was sent to investigate. The pilot was unable to determine the source of smoke that evening and a search of the area the following morning was negative.

(Continued on page 255.)

COAST GUARD RULEMAKING

(Effective November 1, 1972)

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
1971 PUBLIC HEARING							
PH 8–71 Specification:							
8a. Lifeboat winches	2–24–71	3–29–71	5–15–71	X			
8b. Lifeboats	2–24–71	3–29–71	5–15–71	X			
8c. Line-throwing appliances	2–24–71	3–29–71	5–15–71	X			
8d. Inflatable liferafts	2–24–71	3–29–71	5–15–71	X			
PH 9–71 Fibrous glass-reinforced plastic construction of small passenger vessels	2–24–71	3–29–71	5–15–71	...			
(Second Notice of Proposed Rulemaking due to revisions of original proposal)	4–6–72	None	5–8–72	X			
1972 PUBLIC HEARING							
Tailshaft inspection and drawing (67–71, 4–71)	3–1–72	3–27–72	4–3–72	X			
Stability-wind heel criteria for cargo and miscellaneous vessels (43–71)	3–1–72	3–27–72	4–3–72	X			
Definition of international voyage (12–70)	3–1–72	3–27–72	4–3–72	X			
Portable foam firefighting equipment—tank vessels (17–71)	3–1–72	3–27–72	4–3–72	X			
Subchapters D, H, and I, safety factors for cargo gear (20–71)	3–1–72	3–27–72	4–3–72	....		10–4–72	11–6–72
Visual acuity requirements, original licenses (23–71)	3–1–72	3–27–72	4–3–72	X			
ANCHORAGE REGULATIONS							
Casco Bay, Maine	6–16–72		7–19–72	X			
Henderson Harbor, N.Y.	6–28–72		8–1–72	X			
Puget Sound Area, Wash. (CGFR 72–13)	2–3–72		3–5–72	X			
St. John's River, Fla. (CGFR 71–162)	12–22–71		1–31–72	X			
St. Marys River, Mich	6–7–72	7–6–72 7–12–72	7–15–72	X			
San Francisco Bay Area (CGD 72–78)	4–28–72	5–24–72 San Francisco	5–27–72	X			
San Juan Harbor, P.R. (CGFR 72–12)	2–1–72		3–4–72	X			
Willington River, Ga. (CGFR 71–153)	11–25–71		12–27–71	X			
Middle Neebish, Munuscong and Sailors Encampment (CGD 72–169)						10–6–72	10–10–72
BOATING SAFETY (GENERAL)							
Numbering and casualty reporting (CGD 72–54)	4–19–72	5–17–72	5–31–72	....		10–7–72	7–1–73
Revocation of Parts 171, 172, and 173 of Subchapter S of Title 46 (CGD 72–176)				....		10–7–72	1–1–73
Personal Flotation Devices (CGD 72–172, 120, 163)	10–6–72	11–20–72	12–11–72	....			
BRIDGE REGULATIONS							
Bear Creek, Md. (CGFR 72–17)	2–2–72		3–7–72	X			
Black Water River, Fla. (CGD 72–87)	5–10–72		6–13–72	....		10–19–72	11–20–72
Chattahoochee River (CGFR 71–166)	12–29–71	1–26–72 Florida	1–27–72	X			
Idaho State Memorial Bridge, Clearwater River, Lewiston, Idaho (CGFR 71–169)	12–29–71	2–1–72	2–1–72	X			
Interstate I–90 at Lake Washington (CGFR 71–168)	12–21–71	1–27–72 Washington	1–27–72	X			

Coast Guard Rulemaking—Continued

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
Nanticoke, Del. (CGFR 71–142)	11–24–71	.....	12–24–71	X	.....	.....	.....
Ogden Slip, Chicago, Ill. (CGFR 72–16)	2–2–72	.....	3–7–72	X	.....	.....	.....
Sacramento River, Cal. (CGFR 71–165)	12–29–71	.....	2–7–72	X	.....	.....	.....
Saginaw River, Mich. (CGFR 72–18)	2–2–72	.....	3–7–72	X	.....	.....	.....
Union Pacific RR Co., Columbia River (CGFR 71–167)	12–29–71	2–23–72 Washington	1–27–72	X	.....	.....	.....
Fort Caswell Bridge, N.C.	6–21–72	.....	7–25–72	X	.....	.....	.....
Mare Island, Cal.	6–30–72	.....	8–7–72	X	.....	.....	.....
Ohio River at Huntington	6–10–72	7–13–72	7–27–72	X	.....	.....	.....
Ortega River, Fla.	6–21–72	.....	7–25–72	X	.....	.....	.....
Alabama River, Ala. (CGD 72–159P)	8–22–72	.....	9–26–72	X	.....	.....	.....
Clear Creek, Tex. (CGD 72–165P)	8–26–72	.....	10–3–72	X	.....	.....	.....
New River, Fla. (CGD 72–170P)	8–30–72	.....	10–3–72	X	.....	.....	.....
Pompano Beach, Fla. (CGD 72–158P)	8–22–72	.....	9–26–72	X	.....	.....	.....
St. Lucie River, Fla. (CGD 72–168P)	8–26–72	.....	10–3–72	X	.....	.....	.....
West Palm Beach, Fla. (CGD 72–167P)	8–26–72	.....	10–3–72	X	.....	.....	.....
Back Bay of Biloxi, Miss. (CG 72–173R)	.....	.....	.....	....	.....	9–7–72	10–2–72 through 3–3–73
Great Canal, Satellite Beach, Brevard County, Fla. (CGD 72–175PH)	9–13–72	10–30–72	11–13–72	....	.....	.....	.....
Debbies Creek, Manasquan, N.J. (CGD 72–138R)	9–14–72	.....	10–24–72	....	.....	.....	.....
Drawbridge Operations: AIWW, Mile 342, Fla.; Drawbridge Operations (CGD 72–190P)	9–30–72	.....	11–1–72	....	.....	.....	.....
Barnegat Bay, N.J. (CGD 72–211)	10–31–72	.....	12–5–72	....	.....	.....	.....
Middle Branch, Patapsco River, Md. (CGD 72–212)	10–31–72	.....	12–5–72	....	.....	.....	.....
Alabama River, Ala. (CGD 72–203)	10–14–72	.....	11–20–72	....	.....	.....	.....
Ewing Narrows, Harpswell, Me. (CGD 72–205)	10–17–72	11–21–72	12–6–72	....	.....	.....	.....
HAZARDOUS MATERIALS							
Cold compressed gases (CGFR 72–10)	10–16–71	1–11–72	1–18–72	X	.....	.....	.....
	[1] 1–21–72	[1] 2–22–72	[1] 2–29–72	....	.....	9–30–72	12–30–72
Etiologic agents (CGFR 71–170)	1–7–72	3–28–72	4–4–72	X	.....	.....	.....
Radioactive materials (CGFR 71–62)	7–9–71	8–24–71	8–31–71	X	.....	.....	.....
Radioactive materials (CGFR 71–136)	11–20–71	2–22–72	2–29–72	X	.....	.....	.....
Radioactive materials packages (CGD 72–91)	5–24–72	6–20–72	6–27–72	X	.....	.....	.....
Compressed Gas Cylinders (CGD 72–115PH)	8–31–72	9–28–72	10–2–72	X	.....	.....	.....
Dangerous Cargoes—Dichlorobutene (CGD 72–162PH)	8–30–72	10–24–72	10–31–72	X	.....	.....	.....
Etiologic Agents—Supplemental Notice (CGD 72–148PH)	8–9–72	9–5–72	9–12–72	X	.....	.....	.....
Dangerous Cargoes—Phosphorus Pentasulfide (CGD 72–171PH)	9–6–72	10–24–72	10–31–72	X	.....	.....	.....
Dichlorobutene, Corrected, F.R. 9–20–72, Hazardous Cargoes (CGD 72–162PH)	8–30–72	10–24–72	10–31–72	X	.....	.....	.....
MARINE ENVIRONMENT AND SYSTEMS (GENERAL)							
Oil pollution prevention (CGFR 71–160, 161)	12–24–71	2–15–72	4–21–72	X	.....	.....	.....
Atlantic Intracoastal Waterway, Vero Beach, Fla. (CGD 72–155P)	8–16–72	.....	9–19–72	X	.....	.....	.....
MERCHANT MARINE SAFETY (GENERAL)							
Buoyant devices, special purpose water safety (CGFR 72–5)	1–29–72	.....	3–15–72	X	.....	.....	.....
Documentation ports (CGFR 72–19)	2–4–72	.....	4–4–72	X	.....	.....	.....
Fire extinguishers, marine type portable (CGFR 72–36)	3–9–72	4–18–72	4–24–72	X	.....	.....	.....
Incombustible materials (CGFR 72–47)	3–9–72	4–18–72	4–24–72	X	.....	.....	.....
Oceanographic vessels, fire main systems (CGFR 72–20)	2–4–72	.....	3–19–72	X	.....	.....	.....

Coast Guard Rulemaking—Continued

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
Washroom and toilet facilities (CGFR 72–4)	1–15–72	.....	3–20–72	X	.....	.....	.....
Water lights, floating electric (CGFR 72–48)	3–9–72	4–18–72	4–24–72	X	.....	.....	.....
Great Lakes Maritime Academy, List as a Nautical School-Ship (CGD 72–92P)	8–9–72	.....	9–15–72	X	.....	.....	.....
Revocation of Fernandina Beach as a Port of Documentation (CGD 72–75P)	8–9–72	.....	9–12–72	X	.....	.....	.....
Ship's Maneuvering Characteristics Data (CGD 72–132PH)	8–22–72	9–28–72	10–13–72	X	.....	.....	.....
Disclosure of safety standards (CGD 72–187)	10–31–72	.....	12–4–72	X	.....	.....	.....
Unmanned Barges; hull construction (CGD 72–130)	10–31–72	12–19–72	12–29–72	X	.....	.....	.....

[1] Extension of comment period and second public hearing.

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

MARITIME CASUALTIES

(*Continued from page 252.*)

A Marine Board of Investigation was convened by the Commandant. The first reports on the condition of the vessel by Coast Guard divers indicated to the board of investigation members that this was to be more than a case of "several sailors trying to find out what happened to other sailors." Additional hard hat divers were authorized by the Commandant. Video and photographic equipment were used by the divers employed by the Coast Guard and by the team hired by the vessel's owners. In all, some 13 hours of video tape and photographic film were produced by these groups. Numerous still photographs were also produced, some of which appear on these pages.

In addition to viewing the film several times the board held three lengthy formal public sessions during which testimony of former crewmen was taken, information from many sources was obtained, and over one hundred and twelve exhibits were gathered. The work of the board was further complicated by the lack of survivors or any witness who saw or heard the actual explosion.

It is too early to assess what lessons are to be learned from this casualty or what effect it will have on our safety program through changes in regulations or laws. It seems reasonable to assume that we will learn a great deal from this casualty due in part to the underwater films. This, then, is the point I want to make: our Vessel Safety Programs are growing and advancing in the investigative aspect as we utilize technology in the form of the marine information system and films such as these.

You may have noticed by now that I have used the words "change", "advance", and "growth" a great deal; and I have done it deliberately.

I want to leave with you the impression that it is essential that we *continue* to change, grow, and advance if we are to meet the new maritime safety needs. There have been arguments that the Coast Guard's regulations react to rather than anticipate problems in the now complex multifaceted maritime industry and occasionally these arguments are persuasive. Bridge-to-Bridge Radiotelephone Communications had been cited as an important navigational safety tool since the *Andrea Doria–Stockholm* collision in 1956. Now 16 years later we are getting the regulations on the books. There were lives lost during those 16 years which no doubt might have been saved had the vessels involved been able to transmit their intentions over a bridge-to-bridge system. I have already talked about seven people killed in the collision of the barge and cabin cruiser. While their deaths may not have directly resulted in the new regulations for lights on tows, the fatalities must have been a stimulating factor.

I urge that we become more aware of the great need for change and growth in our safety programs. For every casualty in which a life is lost or the ecology is damaged there are dozens of near misses. The casualties make the headlines and prompt the action; the near misses go unreported and unnoticed. We must no longer wait for accidents to happen to show us where the need for action is. Let us begin now to anticipate rather than react to maritime tragedy. ⚓

AMENDMENTS TO REGULATIONS

TITLE 33—NAVIGATION AND NAVIGABLE WATERS

Chapter I—Coast Guard, Department of Transportation

SUBCHAPTER E—NAVIGATION REQUIREMENTS FOR THE GREAT LAKES AND ST. MARYS RIVER

[CGD 72-169R]

PART 92—ANCHORAGE AND NAVIGATION REGULATIONS; ST. MARYS RIVER, MICHIGAN

Middle Neebish, Munuscong, and Sailors' Encampment Channels

This amendment deletes from the regulations specific requirements for the color of range lights and structures marking the Middle Neebish, Munuscong, and Sailors Encampment Channels on the St. Marys River.

The Coast Guard plans to install standard daymarks to enhance the daytime effectiveness of the range light structures rather than rely on structure color for identification. Although no change in the color of the existing range lights is planned, the Coast Guard considers it undesirable for regulations to restrict a future change should conditions so indicate.

Installation of standard range daymarks was requested by users to make the ranges more visible during winter. Since prompt installation of these daymarks before the winter season would enhance maritime safety, and since the amendment will not impose any liability or burden on any member of the public, no useful purpose would be served by delaying rule making to provide for notice to the public.

For these reasons the Coast Guard finds that notice and public procedure thereon are both contrary to the public interest and unnecesary and that good cause exists for making the amendment effective immediately.

In consideration of the foregoing Title 33 of the Code of Federal Regulations is amended by revoking paragraph (c) of § 92.19.

§ 92.19 Temporary closure of West Neebish Channel.

* * * * *

(c) [Revoked]

* * * * *

Effective date. This amendment shall become effective on October 10, 1972.

(Secs. 1–3, 29 Stat. 54055, as amended; sec. 6(b)(1), 80 Stat. 931; 33 U.S.C. 474; 49 U.S.C. 1655(b)(1); 49 CDR 1.46(b))

Dated: September 27, 1972.

J. D. McCann,
Captain, U.S. Coast Guard,
Acting Chief, Office of
Marine Environment and
Systems.

(Federal Register of October 6, 1972.)

TITLE 46—SHIPPING

Chapter I—Coast Guard, Department of Transportation

[CGD 72-150R]

SUBCHAPTER D—TANK VESSELS

PART 31—INSPECTION AND CERTIFICATION

SUBCHAPTER H—PASSENGER VESSELS

PART 71—INSPECTION AND CERTIFICATION

SUBCHAPTER I—CARGO AND MISCELLANEOUS VESSELS

PART 91—INSPECTION AND CERTIFICATION

Inspection and Certification; Factors of Safety

The purpose of this amendment is to make the regulations on cargo gear factors of safety consistent with recognized industry standards. The amendment allows the use of yield point, as an alternative to breaking strength, in calculating the minimal safety factors in the design of cargo gear. It also expands the list of gear items to include factors of safety for stayed masts, pins, and connections.

This amendment is based on a notice of proposed rule making published in the March 1, 1972, issue of the Federal Register (37 F.R. 4292), and in the Marine Safety Council Public Hearing Agenda dated March 27, 1972. The proposed amendment was identified as Item 6–72 in the notice and the agenda.

The Coast Guard invited interested persons to submit comments by April 3, 1972. It also encouraged participation at the public hearing. In response, the Coast Guard received three written comments.

Two of the commenters pointed out that safety factors based on yield strength resulted in overly conservative structures and suggested that the Coast Guard incorporate into the regulations dynamic factors. The Coast Guard prefers a conservative standard for safe cargo handling that can be applied by the industry with minimum difficulties. Accordingly, the suggestion was not approved.

One commenter suggested that footnote 1 of Table 31.37–25(a) be changed by adding the word "the" to precede the final word "steel." The commenter pointed out that "steel" without the suggested definitive article refers only to mild steel. The Coast Guard has accepted this suggestion and added the word "the" to precede the word "steel" in footnote 1.

Accordingly, the Coast Guard amends Parts 31, 71, and 91 as follows:

1. By revising § 31.37–25 to read as follows:

§ 31.37–25 Factors of safety.

(a) Except as provided in paragraph (b) of this section, in the design of cargo gear, the minimal safety factors in Table 31.37–25(a) must be used to meet the requirements of § 31.37–15.

(b) The Commandant may permit the use of safety factors different than those in Table 31.37–25(a) in the design of cargo gear that he considers special.

§§ 71.47–25, 91.37–25 [Amended]

2. By revising §§ 71.47–25 and 91.37–25 to read exactly the same as § 31.37–25, except that the tables within the two sections should be designated §§ 71.47–25(a) and 91.37–25(a) respectively.

(R.S. 4405, as amended, R.S. 4462, as amended, R.S. 4417a, as amended, by Public Law 92–340, 86 Stat. 424, 427 (July 10, 1972), sec. 6(b)(1), 80 Stat. 937; 46 U.S.C. 375, 416, 391a, 49 U.S.C. 1655(b)(1); 49 CFR 1.46(b))

Effective date. This amendment is effective on November 6, 1972.

Dated: September 28, 1972.

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

(Federal Register of October 4, 1972, as corrected by Federal Register of October 14, 1972.)

TABLE 31.37–25(a)

Safe working loads for component parts	Safety factors based on [1]— Ultimate strength	Yield point	Breaking test load
All metal structural parts except steel booms, stayed masts, pins and connections:			
5 tons or less working load of the assembled gear	5.00	[2] 2.75	
15 tons working load of the assembled gear	4.00	[2] 2.20	
60 tons or more working load of the assembled gear	3.75	[2] 2.05	
Steel booms:			
10 tons or less working load of the assembled gear		3.00	
13 tons or more working load of the assembled gear		2.50	
Stayed masts:			
10 tons or less working load of assembled gear	5.00		
13 tons or more working load of assembled gear	4.00		
Pins and connections:			
10 tons or less working load of assembled gear		[2] 3.00	
13 tons or more working load of assembled gear		[2] 2.50	
Wire rope:			
10 tons or less working load			5.00
13 tons or more working load			4.00
Fiber rope:			
For running rigging	7.00		
For fixed gear and vangs	5.00		
Wooden structural parts	8.00		
Chains	4.50		

[1] Intermediate values of safety factors may be used.
[2] The minimum yield point for design purposes shall not be considered greater than 72 percent of the minimum ultimate strength of the steel.

THE LIFESAVING GUNS OF DAVID LYLE

(*Continued from page 249.*)

berg and Harris, badly shaken but safe, reached shore.

The barge is still there.

Late in World War II, controversy again enveloped the Lyle guns. England by then had developed a workable line-carrying rocket that was regarded a superior invention. Lyle guns seem to have been used in scaling cliffs during invasions, but rockets seem to have equalled them in that use. The old problems of rockets were still there in the new ones, but technology had diminished them. For reasons not fully explainable at the time, performance of the Lyle guns had in some cases become erratic. In one explainable incident, however, a Greek crew, not taking into account the difference between black and smokeless powders, had charged one with smokeless, with ill consequences.

Issues were drawn, and arguments flew. In the main, the Lyle guns were 19th Century devices caught in the gears of the mid-20th Century. In 1947, the Coast Guard (which over the years had acquired inspecting authority over the guns) yielded to the arguments for rockets. In 1952, production of Lyle guns for domestic use stopped. A very few reportedly still remain in service aboard ships, mostly foreign.

David Lyle himself was retired for old age in 1909, with the rank of colonel. A letter of his career, written by The Honorable Sumner I. Kimball, credits his invention with saving about 4,500 lives between 1878 and 1909, in this country alone. By 1920, his guns were standard marine rescue equipment the world over. His career in ordnance and lifesaving apparatus had won him repeated honors in America and Europe, and he had written several books.

After retirement, Lyle continued studying and writing. He served as a special editor of Funk and Wagnall's *New Standard Dictionary* of 1913, and published over eighty papers on professional, ornithological, and geological subjects before his death, in 1937, at St. David's, Pennsylvania. He was 92.

ANNUAL INDEX—VOLUME 29

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 (4–1–72). F.R. 7–21–72.
115	Marine Engineering Regulations (7–1–70) FR. 12–30–70, 3–25–72, 7–18–72.
123	Rules and Regulations for Tank Vessels (5–1–69) F.R. 10–29–69, 2–25–70, 6–17–70, 10–31–70, 12–30–70, 3–8–72, 3–9–72, 6–14–72, 7–18–72, 10–4–72, 10–14–72.
129	Proceedings of the Marine Safety Council (Monthly).
169	Rules of the Road—International—Inland (8–1–72). F.R. 9–12–72.
172	Rules of the Road—Great Lakes (7–1–72). F.R. 10–6–72.
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, 6–21–72, 6–28–72, 7–7–71, 7–21–72.
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, 9–14–72, 3–14–72, 4–4–72, 4–28–72, 5–10–72, 5–17–72, 6–14–72, 6–21–72, 7–4–72, 8–9–72, 8–11–72, 8–31–72, 9–14–72, 10–19–72.
191	Rules and Regulations for Licensing and Certification of Merchant Marine Personnel (6–1–72).
200	Marine Investigation Regulations and Suspension and Revocation Proceedings (5–1–67). F.R. 3–30–68, 4–30–70, 10–20–70, 7–18–72.
220	Specimen Examination Questions for Licenses as Master, Mate, and Pilot of Central Western Rivers Vessels (4–1–57).
227	Laws Governing Marine Inspection (3–1–65).
239	Security of Vessels and Waterfront Facilities (5–1–68). F.R. 10–29–69, 5–15–70, 9–11–70, 1–20–71, 4–1–71, 8–24–71, 2–15–72.
249	Marine Safety Council Public Hearing Agenda (Annually).
256	Rules and Regulations for Passenger Vessels (5–1–69). F.R. 10–29–69, 2–25–70, 4–30–70, 6–17–70, 10–31–70, 12–30–70, 3–9–72, 7–18–72, 10–4–72, 10–14–72.
257	Rules and Regulations for Cargo and Miscellaneous Vessels (8–1–69). F.R. 10–29–69, 2–25–70, 4–22–70, 4–30–70, 6–17–70, 10–31–70, 12–30–70, 9–30–71, 3–9–72, 7–18–72, 10–4–72, 10–14–72.
258	Rules and Regulations for Uninspected Vessels (5–1–70).
259	Electrical Engineering Regulations (6–1–71). F.R. 3–8–72, 3–9–72, 8–16–72.
266	Rules and Regulations for Bulk Grain Cargoes (5–1–68). F.R. 12–4–69.
268	Rules and Regulations for Manning of Vessels (10–1–71). F.R. 1–13–72
293	Miscellaneous Electrical Equipment List (9–3–68).
320	Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf (7–1–72). F.R. 7–8–72.
323	Rules and Regulations for Small Passenger Vessels (Under 100 Gross Tons) (12–1–71). F.R. 3–8–72, 3–25–72, 6–24–72, 7–18–72.
329	Fire Fighting Manual for Tank Vessels (7–1–68).

CHANGES PUBLISHED DURING OCTOBER 1972

The following have been modified by Federal Registers:

CG–190, Federal Register of October 19, 1972.

CG–123, CG–256, CG–257, Federal Registers of October 4 and 14, 1972.

CG–172, Federal Register of October 6, 1972.