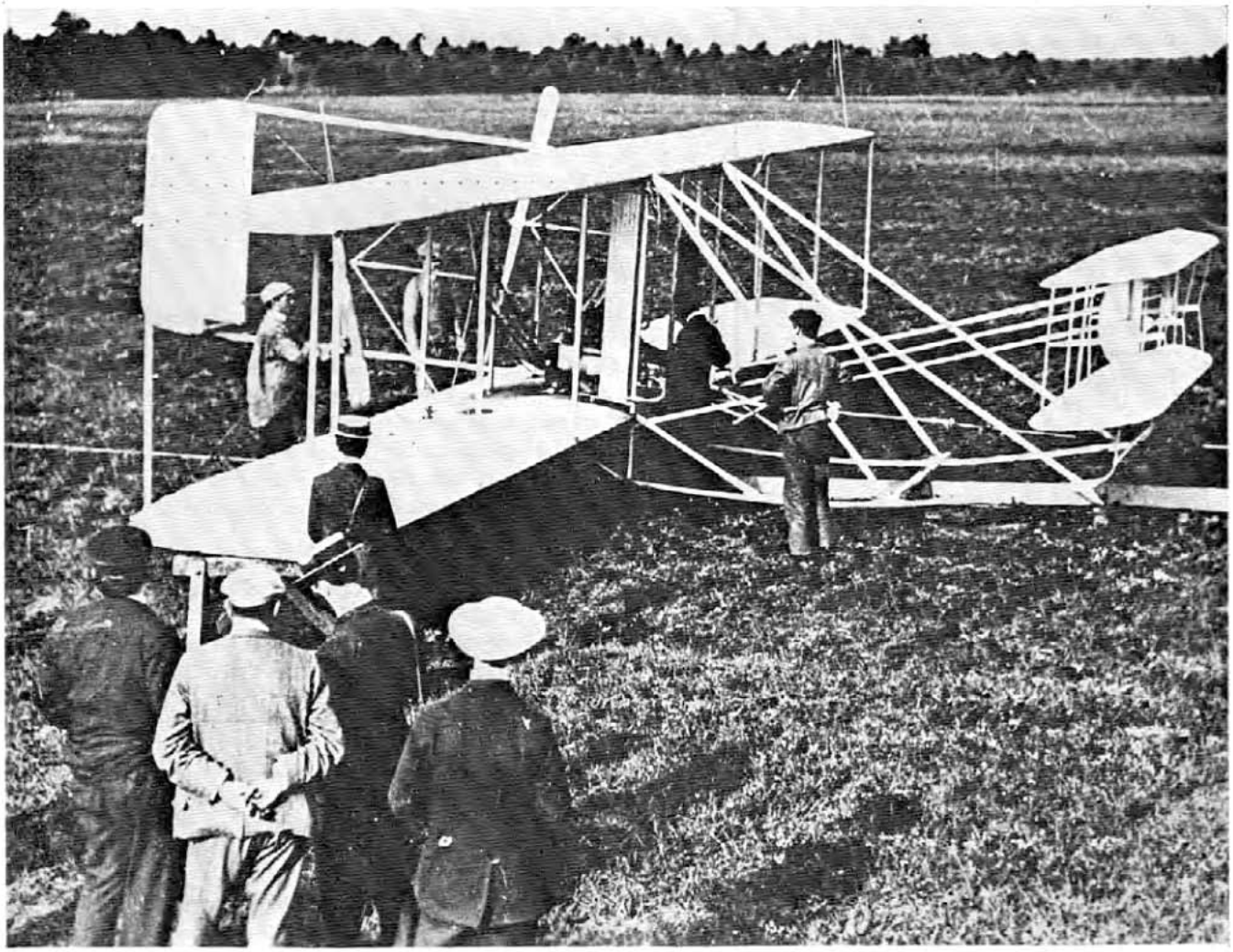
PROCEEDINGS
OF THE MARINE SAFETY COUNCIL



DEPARTMENT OF TRANSPORTATION UNITED STATES COAST GUARD

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PROCEEDINGS

OF THE MARINE SAFETY COUNCIL

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FRONT COVER

Biplane *Kitty Hawk*, the world's first successful power driven heavier-than-air flying machine which was invented by Orville and Wilbur Wright, is readied for its historic first flight. Among the men gathered to assist the Wright brothers and to witness the event are surfmen from nearby Kill Devil Hills Lifesaving Station. One of these life savers, John T. Daniels, took the only pictures ever made of the first flight at the request of the Wright Brothers.

BACK COVER

The crude oil carrier *Elias* shows the massive damage caused by the explosions and fire which erupted during offloading. Thirteen persons were killed in this casualty, which occurred just before midnight on 9 April 1974.

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maritime sidelights

SEA WITCH FILM

A film of the *Sea Witch-Esso Brussels* disaster is currently available for loan from local Coast Guard District Public Affairs Offices or from Commandant (G–APA/83), U.S. Coast Guard, Washington, D.C. 20590. This dramatic color film provides an excellent account of the events which surround this major casualty.

AFTER YOU

Have you ever entered a cargo tank or enclosed space aboard a ship or barge and felt faint or nauseous? Have chemical vapors in such spaces ever made you feel drunk, off-balance, or giddy? If you can answer "yes" to any of these questions than *you are lucky!* You are lucky because you are alive to read this and you have a chance to learn safe tank entry procedures.

Entering a cargo tank or enclosed space aboard a vessel is a serious business. The hazards are many and the risks involved are high if proper precautions are not followed. Low concentrations of oxygen in a tank or space can render a person unconscious or dead in a very short time; chemical vapors in high concentrations may kill a person immediately or lower vapor concentrations can leave a person sick for some time. Some chemicals work insidiously, leaving no trace of their evil work until years later. The Commandant (G–MHM/83) has prepared an illustrated, easy-to-read pamphlet, entitled, "When you Enter That Cargo Tank . . .," describing the basic hazards associated with entering cargo tanks and enclosed spaces. This pamphlet is also intended to serve as a guide to safe entries and more importantly, safe *exits* from cargo tanks and enclosed spaces. The pamphlet will be available after 26 April 1976. Twenty-five copies of the pamphlet will initially be distributed to each of the Marine Safety Offices, Marine Inspection Offices, and the Captain of the Port Offices. Other interested parties may obtain copies of this pamphlet by contacting the Commandant (G–MHM/83), U.S. Coast Guard, Washington, D.C. 20590. This pamphlet should be reviewed by Coast Guard marine inspectors and law enforcement personnel who must enter confined spaces.

Occasionally the Cargo and Hazardous Materials Division receives inquiries from Coast Guard field units as to the availability of personnel protective clothing and respiratory protective equipment.

A survey was conducted in 1974 by the Commandant (G–DET) to determine the availability of protective clothing and breathing apparata, and their capability for protecting persons from dangerous environments caused by discharges of hazardous chemicals. The information from this survey has been published and is available from the National Technical Information service, Springfield, Va. 22161. The title of the publication is, *Survey of Personnel Protective Clothing and Respiratory Apparata for use by Coast Guard Personnel in Response to Discharges of Hazardous Chemicals.* The catalog number is AD–A010 110. The price (subject to change) is $5.

STEERING GEAR FAILURE

The Merchant Vessel Inspection Division of the Coast Guard Office of Merchant Marine Safety continues to receive reports of steering gear failures aboard U.S. merchant vessels. Two most recent casualties serve to amplify the importance of thorough tests and inspections by ship's personnel.

In December 1975 a 20,000-gross-ton tankship suffered a failure of the port steering gear motor coupling while operational tests were being conducted during a Coast Guard inspection. Examination of the starboard steering gear motor coupling showed it to be worn and near failure. This casualty was attributed to improper installation of the couplings and lack of periodic lubrication.

In January a second 20,000-gross-ton tankship suffered a steering gear failure while underway. In this case the hydraulic pump sliding control shaft which controls the tilting box position broke off. The floating ring remained off center causing the rudder to swing hard over to port, crushing the ram guide stops on both sides. This failure was attributed to worn control link rod ends transmitting a vibration to the sliding control shaft with a resultant ultimate failure of the metal.

In order for tests and inspections to be effective, shipboard personnel must be thoroughly familiar with the equipment. Instruction manuals are the best source for determination of a system's design capabilities. Periodic examination by the ship's force must include operation and visual inspection of the entire system. Problem areas which have been discovered by, or reported to, the Coast Guard include the following:

a. port and starboard steering cables, motors and pumps;

b. emergency pumps;

c. bridge, local and secondary controls;

d. trick wheel and remote trick wheel; and

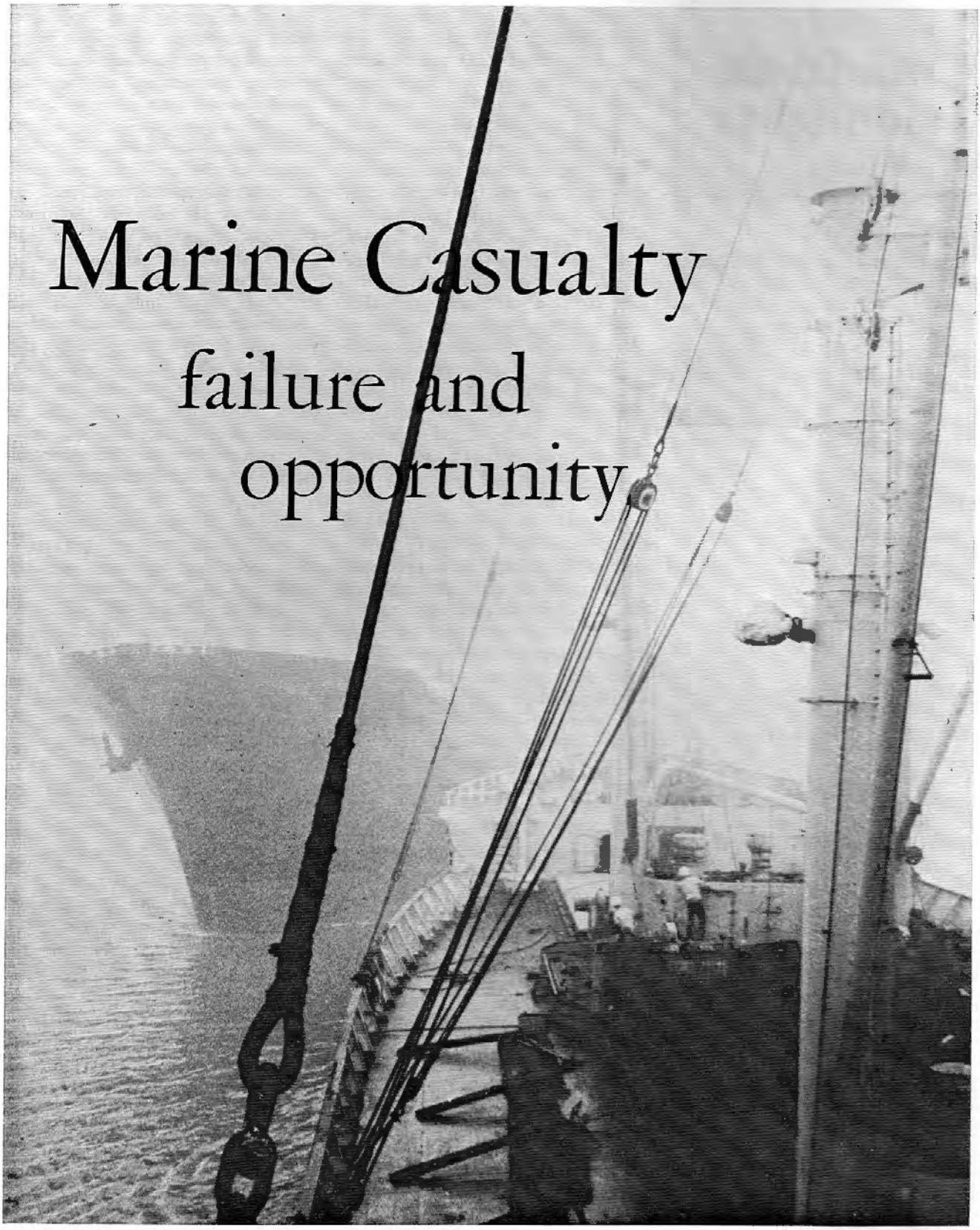
e. emergency power supply thru both manual and automatic operation of a bus transfer system.

Excessive oil leakage, abnormal hydraulic pressures, worn ram guides and linkages, unusual noise, vibration, and erratic or sluggish movements should be a cause for concern. Remember steering gear failures are like collisions; they can ruin your whole day.

(Continued on page 110.)

Marine Casualty

failure and opportunity



by CAPT Clyde T. Lusk, Jr., USCG

The following is adopted from a presentation at the Louisiana Safety Conference, Marine Section, April 6, 1976.

A marine casualty is a hard-to-disguise failure. Many occur because of malfunctioning equipment, violation of law, or errors in judgment; all are manifestations of nonperfect safety systems.

Some in the safety business find it necessary to periodically justify their program by reciting (or should I say "juggling"?) statistics to show an improved safety record. In the marine mode such efforts are difficult because of the makeup of the U.S. Fleet, the changing effectiveness of reporting and enforcement procedures, and all manner of other variances, even including the inflation our marital partners complain of.

While touching on economics, I'll mention that the Coast Guard has retained a $1500 damage prerequisite as part of our casualty reporting criteria, notwithstanding the argument that inflation has justified an increase in that dollar figure. A $5000 cutoff has been suggested by those who suggest that the existing determinate has resulted in an apparent increase in the number of casualties. There is substance to that observation, but I suggest that our system should be as concerned with lesser casualties and near-misses as it is with "hits." Perhaps the only benefit of inflation is that we are now investigating casualties which resulted in less serious monetary damage than those we were investigating a few years ago. There must be a simpler way to increase the sensitivity of our system!

In any event, it is not my purpose to justify the Coast Guard's track record in the area of commercial vessel safety. Rather, I would like to address our post-incident response to marine casualties. The "it's happened, let's learn from it" part of the business.

Unfortunately we have many opportunities for that kind of learning. During fiscal year 1975 (1 July 1974–30 June 1975), the Coast Guard investigated 3305 system failures, otherwise known as reportable marine casualties. Each of these casualties involved commercial rather than pleasure vessels and included such occurrences as collisions between vessels, rammings of piers and bridges, explosions and fires, groundings, founderings, capsizings, floodings with and without sinking, and material failure of vessel structure and equipment. The total figure includes 394 foreign vessels which sustained a casualty in U.S. waters or which were involved with a U.S. vessel in international waters; it also includes 1486 uninspected towing vessels. During the fiscal year there were 190 deaths directly attributable to vessel casualties, and 325 vessels were either never salvaged or were declared a total loss as the result of a marine casualty.

The casualty figures cited include those casualties serious enough to have warranted the convening of a formal Marine Board of Investigation. Such Boards addressed the 18 January 1974 collision in the Mississippi River of the Norwegian freighter *Baune* and the U.S. tanker *Keytrader;* the 9 April 1974 explosion aboard the Greek tanker *Elias* in Philadelphia; the 26 September 1974 stranding of the U.S. tanker *Transhuron* off the West Coast of India; and the 31 January 1975 collision of the U.S. tanker *Edgar M. Queeny* with the moored Liberian tanker *Corinthos* at Marcus Hook, Pa. Fifty-five deaths and thirteen injuries resulted from these casualties. Dollar damage amounted to $49,820,000 for vessels, cargo, and property.

A recent Marine Board of Investigation examined the sinking of the Great Lakes ore carrier *Edmund Fitzgerald* on 10 November 1975 with the loss of all hands. Admiral Barrow, the Chairman of that Board has made arrangements for the Coast Guard to lease remotely-operated deep sea observation equipment to give Board members a view of the *Edmund Fitzgerald.* The vessel is under about 500 feet of water in Lake Superior, thus negating the chance of more conventional data gathering techniques. Expensive? Yes, but necessary if we are to learn from the loss. Another Board action concerns the explosion aboard the tank barge *B–924* at Greenville, Miss. on 13 November 1975 which resulted in the death of four persons.

Among the 440 marine casualties presently under investigation by my office in New Orleans are the sinkings of four offshore supply vessels: the *Elmer D. Connor,* the *Pegasus,* the *Bo-Truc No. 5,* and the *Bo-Truc No. 9.* These casualties occurred on Christmas Day 1975 in the Gulf of Mexico and resulted in the loss of five lives, including the entire crew of the *Bo-Truc No. 9.* We have lost a number of this type of vessel during the past few years and we are trying to find a pattern to these losses. Perhaps we will note a design or operating modification that will help prevent recurrences; perhaps a need for an additional type of training. In any event, we hope to find an answer.

The past decade's technological advances have been accompanied by an increased industrial need for vast quantities of hazardous bulk materials. Since movement by water is the cheapest and safest means of transportation, shippers have chosen the marine mode whenever available. The corresponding growth of waterborne commerce has primarily come as an increase in the number of vessels plying our navigable waters. As you are all aware, increased traffic density and a simultaneous increase in our country's environmental awareness has constituted a real challenge to the continued effectiveness of our marine regulatory system.

During this period the Coast Guard has struggled to chart the most prop-

er regulatory course between the varying interests of all impacted by the regulations that we promulgate and administer. We recognize that the present state of the art makes total freedom from risk synonomous with traffic cessation; on the other hand, there are needs and benefits associated with safety and environmental protection. Opinion regarding our success in achieving the ideal balance in addressing these oft-conflicting needs varies with the perspective of the beholder. Needless to say, not everyone is pleased all of the time. I sometimes wonder if anyone is ever pleased!

Fortunately, we have established an effective combination of advisory committees, in-house expertise, contractor assistance, and regulation promulgation techniques to assure input and evaluation from all sectors. No one may get regulations in the exact form he feels appropriate but, on balance, I feel the system is quite responsive to public needs.

In great measure through the investigation of marine casualties, problem areas and shortcomings in regulations administered by the Coast Guard are brought to light and changes to those regulations stimulated. Anticipatory regulation is our goal, but hindsight has been and continues to be responsible for many of the laws and regulations affecting the marine industry today. While decrying reliance on hindsight, I must confess it's use is reality, and I propose to discuss here several recent legislative and regulatory changes that have resulted, or at least were stimulated, by marine casualties.

On the evening of 6 April 1969 a collision occurred between the Taiwanese freighter *Union Faith* and the *IOC No. 7,* one of three loaded tank barges in tow of the *Warren J. Doucet,* in New Orleans Harbor. The collision occurred slightly upstream from the Greater New Orleans Bridge on the left descending side of the river. Fire and explosions ensued almost immediately on both the tank barge and the freighter. The *IOC No. 7* broke into two sections which drifted and sank. Crude oil burned on the river, threatening both moored vessels and harbor facilities. The *Union Faith* drifted, burning from stem to stern for approximately 5 hours until it sank. Twenty-five persons aboard the *Union Faith,* including all personnel on the vessel's bridge at the time of the collision, died as a result of this casualty. Monetary loss of vessels and cargo, and repairs to the Greater New Orleans Bridge were estimated to be in excess of $2 million.

The Marine Board of Investigation concluded that the primary cause of the casualty was the failure of the *Union Faith* and the *Warren J. Doucet* to reach an agreement as to the method of passing in a meeting situation. Such failure was found to be due, in part, to the absence of a common radio frequency being guarded aboard the two vessels. In addition, the Board also concluded that the failure of the operator of the *Warren J. Doucet* to follow the Rules of the Road was a contributing factor to the casualty. Pursuant to these conclusions, the Board recommended enactment of legislation requiring a bridge-to-bridge radiotelephone on certain vessels and the licensing of towboat operators.

On 16 March 1968, just 13 months prior to the *Union Faith* disaster, the SS *African Star,* downbound on the Lower Mississippi River in the vicinity of Mile 46 above Head of Passes, attempted a starboard-to-starboard passing with two loaded tank barges pushed by the *Midwest Cities.* The pilot of the *African Star* attempted to communicate his intention to the pilot of the *Midwest Cities* over his radiotelephone; however, he was unsuccessful due to the absence of a common radio frequency. This failure to reach a mutually acceptable passing agreement resulted in the two vessels colliding. Crude oil from the tank barges spread over the surface of the water and ignited, engulfing the *African Star* in flames. Twenty-one persons died aboard that vessel. The Marine Board convened to investigate this casualty also recommended bridge-to-bridge radiotelephone legislation and the passage of a towboat operator licensing act.

The *Union Faith/Warren J. Doucet* and the *African Star/Midwest Cities* collision clearly exemplified the need for legislative action. Finally, on 1 January 1973, the Vessel Bridge-to-Bridge Radiotelephone Act became effective.

The Bridge-to-Bridge Radiotelephone Act was intended to provide a positive means whereby the operators of approaching vessels could communicate their intentions to one another through voice radio, on an established frequency dedicated to the exchange of navigational information. It is difficult to measure the benefit from the system since the time of its enactment; however, I suggest that it is generally recognized to have been of inestimable value. In like fashion, it is difficult to say, whether the *Union Faith* or the *African Star* disasters would have positively been avoided had the vessels involved established communications over a common frequency; however, had the vessels done so, the chances of collision would have been greatly reduced. Without question, the system is operationally sound and has been accepted by the marine industry. Such should be the case. It was developed in close cooperation with industry to serve an industry, and as is usually the case, a coincidental public need.

On 1 September 1973, the Towing Vessel Operator Licensing Act was enacted. It requires most uninspected towing vessels to be under the direction and control of a person licensed by the Coast Guard. The intent of the Act was to introduce a set of personnel standards and qualifications into an operation where few had existed before, in the expectation of reducing the number of personnel-caused marine casualties. The very nature of the requirement for an operator to pos-

sess a license, which an act of misconduct, negligence, or incompetence can jeopardize, can hardly fail to result in an overall improvement in adherence to statutory requirements and the good practices of seamen. While we recognize that the mere possession of a license does not guarantee operator infallability, it unquestionably has increased the minimum level of competence. That's a good start and a real tribute to those who encouraged and supported the licensing effort.

During the early hours of 16 January 1974, New Orleans Harbor was again under a threat of such dimensions as to capture national attention. The stage was set previous to the incident by periods of dense fog which virtually halted the movement of traffic upon the river. Deep draft vessels were building up outside the sea buoy marking the entrance to the Lower Mississippi River and at general anchorages from the Head of Passes to Baton Rouge. Barge fleets in New Orleans Harbor were also building up with empty grain barges awaiting movement north and loaded barges awaiting discharge at various locations. In addition to the fog, navigation and fleeting security were further hampered by the flood stage of the river with associated swift current and abnormal eddies.

These conditions, combined with a degree of apathy toward barge fleet security, resulted in a massive barge breakaway on 16 January 1974 in New Orleans Harbor. By midafternoon over 150 vessels had become involved in the breakaway, and most received damage. The majority of the vessels involved were open-hopper grain barges; however, various other types of vessels, including tank barges, derrick barges, deep draft anchored vessels and a drill rig under construction were also struck. In addition, the Mandeville Street, Louisa Street, and Congress Street Wharfs received damages estimated at more than $150,000. The total cost of damages was estimated to be in excess of $1.5 million. Not one life was lost nor a personal injury sustained, but think of the potential! Who said that they don't believe in luck?

This casualty exemplified to many the need for regulations prescribing minimum standards of mooring and surveillance of fleeted barges; however a review of casualty records prior to 16 January 1974 would clearly demonstrate a long standing need for such regulations. As a former Officer in Charge of Marine Inspection and Captain of the Port in St. Louis, I can certainly vouch that breakaways periodically menanced that city. Those were the days before the regulatory enabling authority of the Ports and Waterways Safety Act. Those were the days when we had to rely upon moral suasion, and media support to control fleeting practices. A frustrating situation! Too often it takes an incident of great magnitude to stimulate preventive measures. As a direct result of the incident of 16 January 1974, Commander, Eighth Coast Guard District issued a set of temporary regulations that prescribed standards for the mooring and security of certain fleeted barges. On 2 January 1976 permanent regulations for the mooring of barges in the New Orleans Harbor were issued by the Coast Guard. I suggest that the regulations are serving a great safety, environmental, and cost-benefit need, but like all other mortal efforts the regulations and their enforcement must be kept abreast of current needs and the state of the art.

Another tragic incident exemplifying the need for increased attention to vessel safety and crew survivability was demonstrated by the loss of the U.S. tanker *Texaco Oklahoma* on 27 March 1971. The vessel's final voyage began at Port Arthur, Tex. on 22 March. The *Texaco Oklahoma,* loaded with 220,000 barrels of fuel oil and manned by a crew of 44 was en route Boston, Mass. on 25 March 1971. While heading north along the East Coast she encountered heavy weather. Wind and seas intensified, reaching gale force on the 27th of March as the vessel proceeded east of Cape Hatteras, N.C. At about 3:30 in the morning crewmembers quartered in the stern portion of the vessel heard a loud crack. Those men, though not aware of exactly what happened, passed the alarm to their sleeping shipmates. A group raced to the starboard side to prepare the No. 3 lifeboat for launching and, looking forward, saw the vessel's forward section, tilted bow up, drifting toward them. The vessel had broken in two in the vicinity of the No. 5 tanks, just aft of the forward deckhouse. The bow section of the tankship drifted away and out of sight with thirteen crewmembers never to be seen again.

The stern section with 31 crewmembers remained afloat some 26 hours before those crewmembers were forced to abandon. It was 11 more hours before notice of the casualty reached anyone ashore. Of the 44 crewmembers who sailed aboard the *Texaco Oklahoma* 31, including the 13 on the bow section and 18 others, perished. Thirteen men survived the catastrophe.

A Coast Guard Marine Board of Investigation was convened to investigate the circumstances surrounding the loss of the *Texaco Oklahoma.* In addition and concurrently, the Commandant of the Coast Guard ordered that all vessels of the same class as the *Texaco Oklahoma* be inspected internally as soon as practicable. All 14 of the class, plus several other tankships of like dimensions under U.S. flag, were inspected and examined internally. Although minor defects and structural failures were found in some vessels, the inspections revealed no startling conditions or any major defect of a type common to the class.

The Board concluded that the cause of the casualty was a massive structural failure due to stresses imposed on the hull girder as the ship labored in extremely heavy seas. The Board also concluded that there had been ample time and adequate resources available for rescue but that a distress message had never been re-

ceived, probably because of improper use of the available lifeboat radio transmitter.

The Board commented regarding the possibility that had the Coast Guard had better procedures for collecting and analyzing inspection and repair records there might have been a timely indication of a deficiency or condition the repair of which might have prevented the casualty. They noted that at the time the Service's analysis of operational experience received its data in great measure from reports of casualties and records of Boards of Investigation. They further noted that ". . . the extensive experience derived from routine inspections and general shipyard overhauls is contained in the records of individual marine inspection offices. It is not centrally collected, correlated and analyzed. Consequently, it is not generally available to make inspection procedures more effective by identifying areas which may rerequire special attention." What the Board recommended, what the Coast Guard proposes for the future, and what I am personally most enthused about is a centralized management information system utilizing modern communications and data processing techniques to be set up to collect, correlate, analyze, and disseminate inspection, casualty and related information. With such a system the Coast Guard will be capable of analyzing at a central location inspection, repair, and casualty records from all marine inspection offices so as to direct special inspection and regulatory attention to trouble spots, to evaluate optimum inspection intervals, to brief inspectors regarding pecularities of a vessel and her class before inspection, and even to determine the continued need for certain regulations. Happily, we're well on our way toward completion of feasibility studies for such a system. Work is being done by Battelle and our Washington Headquarters staff.

The *Texaco Oklahoma* casualty was also instrumental in exemplifying the need for some type of automatic locating device aboard oceangoing vessels. On 1 March 1975, the requirement that certain inspected vessels engaged in ocean and coastwise service carry a Coast Guard approved emergency position indicating radiobeacon (EPIRB) became effective. The new rules apply to most inspected vessels engaged in ocean and coastwise service. It is hoped that the EPIRB, an automatic, self activating, electronic device, will significantly reduce the possibility of survivors remaining undetected for long periods of time. I have seen reports that the device has already proven itself. Chalk up another victory on the road to maritime safety.

If we collectively and flawlessly executed our safety responsibilities we would avoid all casualties by anticipating and removing their causes. One day, computer analysis of a combination of inputs from such diverse feedback sources as periodic regulatory inspections and classification surveys, preventative maintenance reports, manufacturers' service reports, and casualty analysis may truly let us regulate in an anticipatory fashion that at the same time avoids being over-restrictive. We've come a long way toward that goal but, as the statistics in my introductory paragraph indicate, we're not there yet.

While we're working toward that somewhat Utopian goal we've got to do what we always do—make the best use of what we have. I suggest that this necessitates that after first quickly and sadly viewing every casualty as a system failure we should carefully and enthusiastically view it as an opportunity to prevent a recurrence. That's what our casualty investigation program is all about.

maritime sidelights

(Continued from page 105.)

LNG POSITION PAPER

The Office of Merchant Marine Safety and the Office of Marine Environment and Systems have jointly prepared a publication entitled "Liquefied Natural Gas, Views and Practices, Policy and Safety", CG–478. This position paper expresses the current views, practices, and policies of the Coast Guard with respect to the marine transport of liquefied natural gas (LNG). Also included are a number of frequently asked questions about LNG.

The report is composed of five parts plus two appendices. The first section discusses the history of LNG transportation, including its accident history as well as a short history of other cargoes. The next section covers the properties and hazards of LNG, identifying the most significant potential hazards and postulating a credible accident scenario. The third section analyzes LNG vessel design, vessel safety, and the Coast Guard's approval procedures. The fourth section discusses the operational controls and facility requirements established by the Coast Guard necessary for the safe transport of LNG. The fifth section outlines the training and qualification standards for personnel aboard the vessel as well as at the terminal. The two appendices provide additional useful information. In the first there are answers to several commonly asked questions, while in the second is a list of selected further readings on LNG.

The Coast Guard will periodically review the pamphlet and will publish revised editions as necessary to insure that the information is current. Interested persons may obtain copies from Commandant (G–WLE–1/73), U.S. Coast Guard, Washington, D.C. 20590 (Phone: 202–426–1927).

Heritage

In 1900, the men of the U.S. Lifesaving Service and their predecessors within the Treasury Department had been rendering their services to mariners for over 50 years. But few people knew at the time—and not many more are aware today—of the considerable, though unofficial, aid being given by the lifesavers to two voyagers of a rather unconventional sort. And no one could have known of its importance.

The following is reprinted, with permission, from the Fall 1975 issue of Aerospace Historian. *The authors are Bernard C. Nalty of the Office of Air Force History and Truman R. Strobridge, Historian of the U.S. Coast Guard.*

THE two brothers who manufactured the Wright Special, a safety bicycle with wheels of equal diameter, pneumatic tires, and a price tag of $18, faced a problem that dealt only indirectly with their Daton, Ohio, factory and the product they built there. In May 1900, Wilbur Wright sent a letter to Octave Chanute, author of *Progress in Flying Machines,* confessing that, like Chanute, he was "afflicted with the belief that flight is possible to man," and asking help in finding a place suitable for a series of experiments. "My business," Wilbur continued, "requires that my experimental work be confined to the months between September and January and I would be particularly thankful for advice as to a suitable locality where I could depend on winds of about 15 miles per hour without rain or inclement weather." [1]

This letter was one of a series of inquiries that led Wilbur and his brother, Orville, to Kitty Hawk, a remote village on the Outer Banks of North Carolina where as one resident told them "you could, for instance, get a stretch of sandy land one mile by five with a bare hill in the center 80 feet high, not a tree or bush anywhere to break the evenness of the wind current." [2]

The choice of Kitty Hawk brought the brothers and their experimental flying machines into contact with the U.S. Life Savings Service. At the turn of the century, the shores of the Outer Banks—called the "graveyard of the Atlantic" because of the frequency of shipwrecks there—were dotted with U.S. Life Saving Stations. Just a few years later, in 1915, these stations and the daring, resourcefull men who operated them would come under the authority of the U.S. Coast Guard, formed by the merger of the U.S. Life Saving Service and the U.S. Revenue Cutter Service.[3]

Wilbur Wright left Dayton early in September 1900 to prepare for some kite experiments. At Elizabeth City, North Carolina, he purchased white pine for the framework of the kite, then obtained passage to Kitty Hawk on a fishing boat that was caught in a gale and almost foundered. The leaking vessel reached its destination without having to call upon the Kitty Hawk Life Saving Station for assistance, but the surfmen who served there, as well as those of the Kill Devil Hills Life Saving Station about four miles distant, would be helping the Wright brothers in a variety of ways.

After Orville arrived, the aerial pioneers pitched a tent and set to work, not on the kite originally planned—an experiment they now felt they could do without—but on a glider capable of carrying a man. The pilot could exercise some control over the completed glider by warping the wings using a web of wires and pulleys that became characteristic of early Wright aircraft. Wing warping enabled the aviator to compensate for wind gusts that would otherwise have driven the plane off course, but test flights indicated the need for a horizontal stabilizer to iron out undulations in the glider's flight path. The answer proved to be a small, moveable wing mounted on spars that extended forward of the main wings.

The glider built and tested in 1900 remained behind when the brother returned to Dayton and soon fell victim to the winter weather. The wife of Kitty Hawk's postmaster salvaged the fabric from the wings and used it to make clothing for her children. Soon nothing remained of the glider that had taught the Wrights so much about stability in flight.[4]

The pilgrimages to Kitty Hawk became more frequent, with the activity centering upon Kill Devil Hills, the sand dunes where the two men had made their glider flights in 1900. The camp came to take on an almost home-like appearance, partly through the efforts of the men at the nearby Kill Devil Hills Life Saving Station. Surfman John T. Daniels and others of the station's crew frequently did the marketing for the aviators and shared with them meals cooked over a gasoline stove. Both brothers, Daniels recalled, were excellent cooks.[5]

A. D. Etheridge, also a surfman from the Kill Devil Hills Life Saving Station, remembered "hauling lumber and carrying mail out to them each day." When the weather was right, Daniels, Etheridge, and the others helped launch the aircraft and retrieve it.[6]

One problem troubling the Wright brothers was beyond the power of the life saving crew to solve. This was the plague of insects that attacked the camp in 1901, "mosquitoes that came in a cloud almost darkening the sun" and covering "the sand and grass and trees and hills and everything." Orville described the ordeal in a letter to his sister, Katherine. "They chewed clear through our underwear and socks," he complained. "Lumps began swelling up all over my body like hen's eggs." Neither smoke from bonfires nor mosquito netting did any good. The insects stayed for several days, then vanished as suddenly as they had come.[7]

Although the brothers were making progress in their experiments, they suffered an occasional setback. The glider tested at Kitty Hawk in 1901 was a disappointment at first but they converted failure into success by flying in the face of existing aerodynamic theory and decreasing the curvature of the upper surface of the wing.

Their improved 1902 glider performed so well that they decided to work toward a new and more difficult goal. Just as a man-carrying kite had given way to the glider, the glider was now replaced in their plans by a self-propelled aeroplane powered by a gasoline engine.

In September of the following year, after building an engine and enlarging the airframe, the Wrights returned to Kitty Hawk and began assembling the powered version of their glider. But they encountered numerous difficulties. Weight was one; the plane seemed too heavy to rise from the skids that served as landing gear. The answer was a dolly—a cart with bicycle hubs for rollers—that carried the craft along a 60-foot railway, sufficient distance, the brothers thought, for the plane to become airborne.

By December 1903, the men of the life saving station had become a skilled ground crew. A red flag flown above the Wright camp alerted these volunteers that a flight was about to begin. On the afternoon of 14 December, the banner signaled the brothers' first attempt to coax their gasoline-powered craft into the air.

Five surfmen from the Kill Devil Hills Life Saving Station responded to the flag. Besides Daniels, who frequently helped the brothers, were Bob Westcott, Tom Beacham, W. S. Dough, and Benny O'Neal. After the brothers had tested the engine, the amateur ground crew helped carry the 605-pound plane the 160 feet that separated the camp from the launching rail. Wilbur Wright won a coin toss and took up a prone position on the lower wing. The helpers managed, though with some difficulty, to release the bonds that restrained the aircraft. Engine pounding, it hurtled down the track, rose into the air before the dolly reached the end of the launching rail, and staggered about 60 feet before flopping to earth from an altitude of 15 feet.[8]

The "real trouble" Wilbur reported to the family in Dayton, "was an error in judgment in turning up too suddenly after leaving the track, and as the machine had barely speed enough for support already, this slowed it down so much that before I could correct the error the machine began to come down, though turned up at a high angle." Damage to the plane was slight, and Wilbur was confident that "there is now no question of final success." [9]

Repairs to the airplane and strong wind delayed the next attempt until 17 December. When the red flag again appeared. Daniels and Dough returned from the Kill Devil Hills Life Saving Station, along with Etheridge, who had helped build the camp. W.C. Brinkley came from Manteo, and a boy, Johnny Moore, from Nag's Head. This was Orville's turn, and at 10:35 in the morning, after the surfmen had aided with the preparations, he guided the fragile craft down the rail and into the air for a flight lasting 12 seconds and covering 120 feet. Wilbur, who had steadied the right wing at the start of the take-off run, stepped back to watch the biplane soar above the sands, and Daniels triggered the camera that the brothers had

brought along, recording forever man's first successful flight in a powered heavier-than-air machine.

Despite minor damage sustained in the day's first landing, the Wrights made three other flight on the 17th, the last, by Wilbur, covering 852 feet in 59 seconds.

After this third and most spectacular effort, the brothers and their volunteer helpers carried the plane back to camp. When a sudden gust of wind caught the machine and started to turn it over, Daniels, Orville, and Wilbur tried unsuccessfully to steady it. As the craft turned over, Daniels lost his balance and fell but he somehow slipped clear of the heavy engine and escaped serious injury, although he received some bad bruises.[10]

Having conquered the sky, the Wright brothers set about notifying their father, Bishop Milton Wright of the United Brethern Church, back in Dayton. Unfortunately, the telegrapher at Kitty Hawk was unable to raise the station at Norfolk, Virginia. He searched about for some closer relay point and settled upon the Currituck Inlet weather station. The operator there, A.W. Drinkwater, who later became a Coast Guardsman, recalled that he had been reporting the grounding of the submarine USS *Moccasin* near the Currituck lighthouse when the man at Kitty Hawk contacted him. Turning from one revolutionary form of transportation to another, he sent the message announcing four successful flights, promising to be home for Christmas, and asking the Bishop to inform the press.[11]

The two inventors crated up the engine and plane for shipment to Dayton and divided the equipment at the camp among their assistants from the Kill Devil Hills Life Saving Station. Daniels ended up with a Wright bicycle, which he used for several years to patrol the beach.[12]

Etheridge, who had helped with the 17 December flight, claimed years later that he had received the wings of the plane that flew that day. He remembered selling them for $25 to a man from Philadelphia. The wings "went from Kitty Hawk on a freight boat to Elizabeth City," Etheridge reminisced, "and he sent me a check . . . and it is right there I lost a fortune." The wings actually were relics of the 1905 airplane, flown three years later at Kitty Hawk. All the components of the original heavier-than-air machine appear to have been shipped north at the same time, ultimately to reach the Smithsonian Institution at Washington, D.C.[13]

The Wright brothers did not return to the Outer Banks until 1908. By this time, aviation had become a routine matter to the crew of the Kill Devil Hills Life Saving Station. So ordinary was aerial flight by their old neighbors, the Wrights, that the General Superintendent of the U.S. Life Saving Service, S. I. Kimball, had to bombard the station's keeper with telegrams to convince him that the 1908 flights were worth reporting.[14]

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1. Wilbur Wright to Octave Chanute, 13 May 1900, in Marvin W. MacFarland, ed., *The Papers of Wilbur and Orville Wright, Including the Chanute-Wright Letters and Other Papers of Octave Chanute*, Vol. I (New York: Arno Press, 1972), 15–19.

2. William J. Tate to Wilbur Wright, 18 August 1900, in Fred C. Kelly, ed., *Miracle at Kitty Hawk: The Letters of Wilbur and Orville Wright* (New York: Farrar, Straus, and Young, 1951), 26.

3. Kensil Bell, *"Always Ready!" The Story of the United States Coast Guard* (New York: Dodd, Mead, and Company, 1943), 189; Howard V. L. Bloomfield, *The Compact History of the United States Coast Guard* (New York: Hawthorn Books, 1966), 121-127.

4. Sherwood Harris, *The First to Fly: Aviation's Pioneer Days* (New York: Simon and Schuster, 1970), 34-38.

5. Carbon copy of memorandum, 15 March 1935, recording a statement made by John T. Daniels, 12 March 1935, at the Nag's Head Coast Guard Station. With an exception noted below, all Coast Guard records cited herein are located in Coast Guard Aviation Files, Records of the U.S. Coast Guard, Record Group 26, National Archives Building.

6. Copy of signed statement by A. D. Etheridge at Nag's Head Coast Guard Station, 12 March 1935.

7. Orville Wright to Katherine Wright, 28 July 1901, in *The Papers of Wilbur and Orville Wright*, Vol. I, 73.

8. Harris, *First to Fly*, 60-62.

9. Wilbur Wright to Bishop Milton Wright and Katherine Wright, 14 December 1903, in *The Papers of Wilbur and Orville Wright*, Vol. I, 393–394.

10. Copy of a signed statement by John T. Daniels at Nag's Head Coast Guard Station on 12 March 1935; excerpt from Diary of Orville Wright, 17 December 1903, in *The Papers of Wilbur and Orville Wright*, Vol. I, 394–396.

11. Copy of a signed statement by A. W. Drinkwater at Nag's Head Coast Guard Station on 12 March 1935.

12. Carbon copy of memorandum, 15 March 1935, recording a statement made by John T. Daniels, 12 March 1935, at the Nag's Head Coast Guard Station.

13. Copy of a signed statement by A. D. Etheridge at Nag's Head Coast Guard Station on 12 March 1935; Orville Wright to Z. Marshall Crane, 21 July 1928, in *The Papers of Wilbur and Orville Wright*, Vol. II, 1149.

14. Letters, S. I. Kimball, General Superintendent, U.S. Life Saving Service, to Keeper, Kill Devil Hills Life Saving Station, 14 and 16 May 1908; Letters, Jesse E. Ward, Keeper, Kill Devil Hills Life Saving Station, to General Superintendent, U.S. Life Saving Service, 14 and 20 May 1908; Telegrams, Ward to General Superintendent, U.S. Life Saving Service, 11 and 15 May 1908, copies in the Historical Files of the Public Information Division, Coast Guard Headquarters.

COAST GUARD RULEMAKING

(Status as of 1 May 1976)

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
BOATING SAFETY							
Lifesaving devices on white water canoes & kayaks (CGD 74–159) comment period extended 6–12–75	2– 4–75		7–15–75	X			
Safe loading and safe powering standards (CGD 73–250)	3– 6–75		4–21–75			9–23–75	3–23–76
Boats and associated equipment (CGD 75–110)	9–19–75		11– 5–75			3–18–76 Corrected 3–25–76	9–15–76
Standards for flotation (CGD 75–168)	4–29–76		7–30–76				
BRIDGE REGULATIONS							
Matanzas River, FL (CGD 75–024)	1–29–75		3– 4–75			3–18–76	4–19–76
Fox River, WI (CGD 75–035)	2– 6–75		3– 7–75	X			
Mystic River, MA (CGD 75–053)	3–27–75		4–29–75	X			
West Palm Beach Canal, FL (CGD 75–070)	3–27–75		4–29–75	X			
Illinois River, IL (CGD 75–060)	4– 1–75		5– 6–75			3–18–76 Corrected 4–12–76	4–19–76
Duwamish Waterway, WA (CGD 75–097)	5–13–75		6–30–75			3–11–76	4–12–76
Tombigbee River, AL (CGD 75–153)	8– 5–75		9– 5–75			2–23–76	3–29–76
Clearwater Pass, FL (CGD 74–299)	8–12–75		9–12–75	X			
Indian River, FL (CGD 75–180)	10–30–75		12– 2–75			2–12–76	3–15–76
Chehalis River, WA (CGD 75–179)	11– 4–75		12– 9–75			2–23–76	3–29–76
Bayou Grosse Tete, LA (CGD 75–215)	11–21–75		12–31–75			2–23–76	3–29–76
Old Fort Bayou, MS (CGD 75–214)	11–21–75		12–31–75			2–23–76	3–29–76
Norwalk River, CT (CGD 75–216)	11–21–75		12–31–75	X			
St. Lucie River, FL (CGD 72–168)	11–21–75		12–31–75	X			
Tacoma Harbor, WA (CGD 75–195)	11–21–75		12–31–75	X			
Lake Champlain, VT (CGD 75–222)	12– 8–75		1– 9–76	X			
Dutch Kills, NY (CGD 75–231)	12–22–75		2– 5–76			4– 1–76	5– 3–76
Shrewsbury, NJ (CGD 75–241)	2– 2–76		2–20–76	X			
Missouri R. IA (CGD 75–244)	2–26–76		3–12–76				
Mitchell River, MA (CGD 76–014)	2–19–76		4– 5–76				
Old Brazos River, TX (CGD 76–024)	3–11–76		4–12–76				
Housatonic River, CT (CGD 76–034)	3–15–76		4–20–76				
Menominee River, WI (CGD 76–069)	4–22–76		5–25–76				
MARINE ENVIRONMENT AND SYSTEMS (GENERAL)							
Pipelines, lights to be displayed (CGD 73–216)	9–19–74 Corrected 10–18–74	10–21–74	11– 4–74	X			
Oil and hazardous substance liability (CGD 73–185)	12– 4–74		1–16–75			3–25–76	4–26–76
Demarcation line, Guayanilla Bay, PR (CGD 73–287)	6–18–75		8– 4–75			2– 5–76	3– 8–76

Coast Guard Rulemaking—Continued

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
MARINE ENVIRONMENT AND SYSTEMS (GENERAL)—Continued							
Demarcation line, San Carlos Bay, FL (CGD 75–235)	1– 2–76	.....	2–18–76	....	.....	3– 1–76	3– 1–76
Visual identification of tank barges (CGD 75–039)	2– 5–76 Corrected 2–23–76	.....	3–16–76	....	.....	.....	.....
Anchorages, Port of New York (CGD 74–194)	3– 1–76	.....	4–15–76	....	.....	.....	.....
Anchorages, Boston Harbor, MA (CGD 76–40)	3–29–76	.....	5–14–76	....	.....	.....	.....
MERCHANT MARINE SAFETY (GENERAL)							
Bulk Dangerous Cargoes, Inspection of Barges (CGD 73–271)	3–11–74	4–15–74	4–30–74	X	.....	.....	.....
First Aid Certificates (CGD 73–272)	4– 2–74 Supp. Notice 12– 1–75	.....	6–15–74 1–16–76	 X	.....	.....	.....
Carriage of Solid Hazardous Materials in Bulk (CGD 74–13)	5–15–74	7–16–74	8–31–74	X	.....	.....	.....
Manning of nautical school ships (CGD 74–201)	1–21–75	.....	3– 6–75	X	.....	.....	.....
Metal borings, shavings, turnings, and cuttings (CGD 75–133)	8– 1–75	.....	9–15–75	X	.....	.....	.....
Marine occupational safety and health standards (CGD 75–101); Advance notice; comment deadline extended 12–11–75	8–11–75	.....	1–15–76	X	.....	.....	.....
Tank vessels; air compressors, cargo handling room bilges (CGD 75–017)	8–13–75	.....	9–29–75	X	.....	.....	.....
Civil penalty procedures (CGD 75–123)	9–11–75	.....	10–27–75	....	2–19–76	.....	.....
Vessel inspection regulations (CGD 75–074)	9–16–75	.....	10–31–75	X	.....	.....	.....
Fire hydrants and hose (CGD 74–60)	9–23–75	.....	11–10–75	X	.....	.....	.....
Electrical cable splicing (CGD 74–305)	10– 8–75	.....	11–24–75	X	.....	.....	.....
Great Lakes pilotage rates (CGD 75–175)	10–31–75	.....	12– 1–75	....	.....	3– 1–76	4– 1–76
Fire and boat drills on passenger vessels (CGD 75–009)	12–17–75	.....	1–26–76	....	.....	4– 1–76	5– 1–76
Structural fire protection (CGD 75–032)	12–22–75	.....	2– 5–76	....	.....	4–29–76	5–31–76
Unmanned barges carrying certain bulk dangerous cargoes (CGD 75–226)	3–15–76	.....	4–29–76	....	.....	.....	.....
Elevators and dumbwaiters, ANSI Code (CGD 75–001)	4– 5–76	.....	5–21–76	....	.....	.....	.....
Noncombustible materials for merchant vessels (CGD 74–129)	4– 5–76	.....	5–21–76	....	.....	.....	.....
Vapor recovery systems in cargo transfer operations (CGD 75–208); Advance notice	4– 5–76	.....	5–21–76	....	.....	.....	.....
Towing vessel stability (CGD 76–018); Advance notice	4–12–76	.....	7– 1–76	....	.....	.....	.....
Tank vessels carrying oil in international trade (CGD 75–240)	4–15–76	5–20–76	6–12–76	....	.....	.....	.....
Measurement of vessels (CGD 75–070)	4–22–76	.....	6– 7–76	....	.....	.....	.....

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 Rule making will be recorded. Proposed changes which have not been placed formally before the public will not be included.

Nautical Queries

The following items are examples of questions to be included in the new Chief Engineer and Master multiple choice examinations which are expected to be in use by September 1976.

Deck

1. The Inland rules differ from the International rules in regards to fog signals for vessels
   A. underway.
   B. aground.
   C. being towed.
   D. all of the above.

2. When cargo is shifted from the main deck into the lower hold of a vessel, which of the following will happen?
   I. The metacenter will move downward.
   II. The GM will increase.
   III. The center of buoyancy will move upward.
   A. II only
   B. I and II only
   C. II and III only
   D. I, II and III

3. In a longitudinally framed ship, the longitudinal frames are held in place and supported by athwartship members called
   A. margin plates.
   B. stringers.
   C. web frames.
   D. floors.

4. Quadrantal error in a gyro compass has its greatest effect
   A. in high latitudes.
   B. near the equator.
   C. on north or south headings.
   D. on inter-cardinal headings.

5. In an emergency on a vessel with automated bridge control, throttle control can be transferred from the bridge to the engine room most expeditiously by
   A. tripping the ahead throttle.
   B. shifting to "NORMAL" plant mode.
   C. using the engine order telegraph.
   D. shifting to "MANEUVERING" plant mode.

Engineers

1. A console method for describing the existing condition of circuits and devices which can remain at only one of two opposite conditions at a particular time is called
   A. logic.
   B. digital display.
   C. feedback.
   D. demand readout.

2. A basic function of the turbine throttle control on engine room consoles is to
   A. provide selection of NORMAL or MANEUVERING mode of operation from a signal device.
   B. control the steam valve travel to a fixed high rate faster than the throttle control lever movement.
   C. override the drum water level when the throttle interlock cannot be energized.
   D. prevent transient boiler modulation by limiting the movement of the throttle control lever.

3. A temperature instrumentation system for an engine room console consists of a resistance temperature detector (RTD), a measuring bridge circuit and a meter or alarm circuit. Which statement concerning the measuring bridge circuit is true?
   A. The input voltage varies in a linear fashion with temperature.
   B. The voltage across the center of the resistance bridge is always constant.
   C. The resistance bridge is said to be balanced when its output voltage is zero.
   D. The input voltage of the resistance bridge is the constant temperature signal.

4. Throttle valve operation through electrical control of a hydraulic actuator on an automated vessel would be termed a (an)
   A. auto mode.
   B. direct mode.
   C. manual mode.
   D. normal mode.

5. To assist in quickly locating a given device in a console, each device symbol in the elementary diagram for a central operating system is assigned a
   A. circuit location number.
   B. surface location number.
   C. coordinate location number.
   D. console location number.

Answers

Deck
1.D 2.A 3.C 4.D 5.C
Engineers
1.A 2.A 3.C 4.B 5.D

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 Saturday, Sunday, and 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 $5.00 per month or $50 per year, payable in advance. The charge for individual copies is 75 cents for each issue, or 75 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.

CG No.	TITLE OF PUBLICATION
101	Specimen Examinations for Merchant Marine Deck Officers (Chief Mate and Master) (1–1–74).
101–1	Specimen Examinations for Merchant Marine Deck Officers (2d and 3d mate) (10–1–73).
108	Rules and Regulations for Military Explosives and Hazardous Munitions (4–1–72). F.R. 7–21–72, 12–1–72, 11–14–74, 6–18–75.
*115	Marine Engineering Regulations (6–1–73). F.R. 6–29–73, 3–8–74, 5–30–74, 6–25–74, 8–26–74, 6–30–75.
123	Rules and Regulations for Tank Vessels (1–1–73). F.R. 8–24–73, 10–3–73, 10–24–73, 2–28–74, 3–18–74, 5–30–74, 6–25–74, 1–15–75, 2–10–75, 4–16–75, 4–22–75, 5–20–75, 6–11–75, 8–20–75, 9–2–75, 10–14–75, 12–17–75, 1–21–76, 1–26–76, 2–2–76, 4–29–76.
169	Rules of the Road—International—Inland (8–1–72). F.R. 9–12–72, 3–29–74, 6–3–74, 11–27–74, 4–28–75, 10–22–75, 2–5–76, 3–1–76.
*172	Rules of the Road—Great Lakes (7–1–72). F.R. 10–6–72, 11–4–72, 1–16–73, 1–29–73, 5–8–73, 3–29–74, 6–3–74, 11–27–74, 4–16–75, 4–28–75, 10–22–75, 2–5–76.
174	A Manual for the Safe Handling of Inflammable and Combustible Liquids (6–1–75).
175	Manual for Lifeboatmen, Able Seamen, and Qualified Members of Engine Department (3–1–73).
176	Load Line Regulations (2–1–71). F.R. 10–1–71, 5–10–73, 7–10–74, 10–14–75, 12–8–75, 1–8–76.
182	Specimen Examinations for Merchant Marine Engineer Licenses (Chief Engineer and First Assistant.) (1–1–74).
182–1	Specimen Examinations for Merchant Marine Engineer Licenses (2d and 3d Assistant) (4–1–75).
184	Rules of the Road—Western Rivers (8–1–72). F.R. 9–12–72, 12–28–72, 3–8–74, 3–29–74, 6–3–74, 11–27–74, 4–16–75, 4–28–75, 10–22–75, 2–5–76, 3–1–76.
190	Equipment List (8–1–72). F.R. 8–9–72, 8–11–72, 8–31–72, 9–14–72, 10–19–72, 11–8–72, 12–5–72, 1–15–73, 2–6–73, 2–26–73, 3–27–73, 4–3–73, 4–12–73, 4–26–73, 6–1–73, 8–1–73, 9–18–73, 10–5–73, 11–26–73, 1–17–74, 2–28–74, 3–25–74, 4–17–74, 7–2–74, 7–17–74, 9–5–74, 10–22–74, 11–27–74, 12–3–74, 12–30–74, 1–15–75, 1–21–75, 2–13–75, 2–19–75, 3–18–75, 3–19–75, 4–9–75, 4–16–75, 5–1–75, 5–7–75, 6–2–75, 6–25–75, 7–22–75, 7–24–75, 8–1–75, 8–20–75, 9–23–75, 10–8–75, 11–21–75, 12–11–75, 12–15–75, 2–5–76, 2–23–76, 3–18–76, 4–5–76.
191	Rules and Regulations for Licensing and Certification of Merchant Marine Personnel (6–1–72). F.R. 12–21–72, 3–2–73, 3–5–73, 5–8–73, 5–11–73, 5–24–73, 8–24–73, 10–24–73, 5–22–74, 9–26–74, 3–27–75, 6–2–75, 7–24–75, 8–13–75, 12–11–75.
*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, 4–24–73, 11–26–73, 12–17–73, 9–17–74, 3–27–75, 7–28–75, 8–20–75, 12–11–75.
227	Laws Governing Marine Inspection (7–1–75).
239	Security of Vessels and Waterfront Facilities (5–1–74). F.R. 5–15–74, 5–24–74, 8–15–74, 9–5–74, 9–9–74, 12–3–74, 1–6–75, 1–29–75, 4–22–75, 7–2–75, 7–7–75, 7–24–75, 10–1–75, 10–8–75.
257	Rules and Regulations for Cargo and Miscellaneous Vessels (4–1–73). F.R. 12–22–72, 6–28–73, 6–29–73, 8–1–73, 10–24–73, 12–5–73, 3–18–74, 5–30–74, 6–24–74, 1–15–75, 2–10–75, 8–20–75, 12–17–75, 4–29–76.
258	Rules and Regulations for Uninspected Vessels (5–1–70). F.R. 1–8–73, 3–2–73, 3–28–73, 1–25–74, 3–7–74.
*259	Electrical Engineering Regulations (6–1–71). F.R. 3–8–72, 3–9–72, 8–16–72, 8–24–73, 11–29–73, 4–22–75.
*266	Rules and Regulations for Bulk Grain Cargoes (5–1–68). F.R. 12–4–69, 8–20–75.
268	Rules and Regulations for Manning of Vessels (12–1–73).
293	Miscellaneous Electrical Equipment List (7–2–73.)
*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) (9–1–73). F.R. 1–25–74, 3–18–74, 9–20–74, 2–10–75, 12–17–75.
329	Fire Fighting Manual for Tank Vessels (1–1–74).
439	Bridge-to-Bridge Radiotelephone Communications (12–1–72). F.R. 12–28–72, 3–8–74, 5–5–75.
467	Specimen Examinations for Uninspected Towing Vessel Operators (10–1–74).

CHANGES PUBLISHED DURING APRIL 1976

CG–123 & 257, Federal Register of April 29.

CG–190, Federal Register of April 5.

*Due to budget constraints or major revision projects, publications marked with an asterisk are out of print. Most of these pamphlets reprint portions of Titles 33 and 46, Code of Federal Regulations, which are available from the Superintendent of Documents. Consult your local Marine Inspection Office for information on availability and prices.