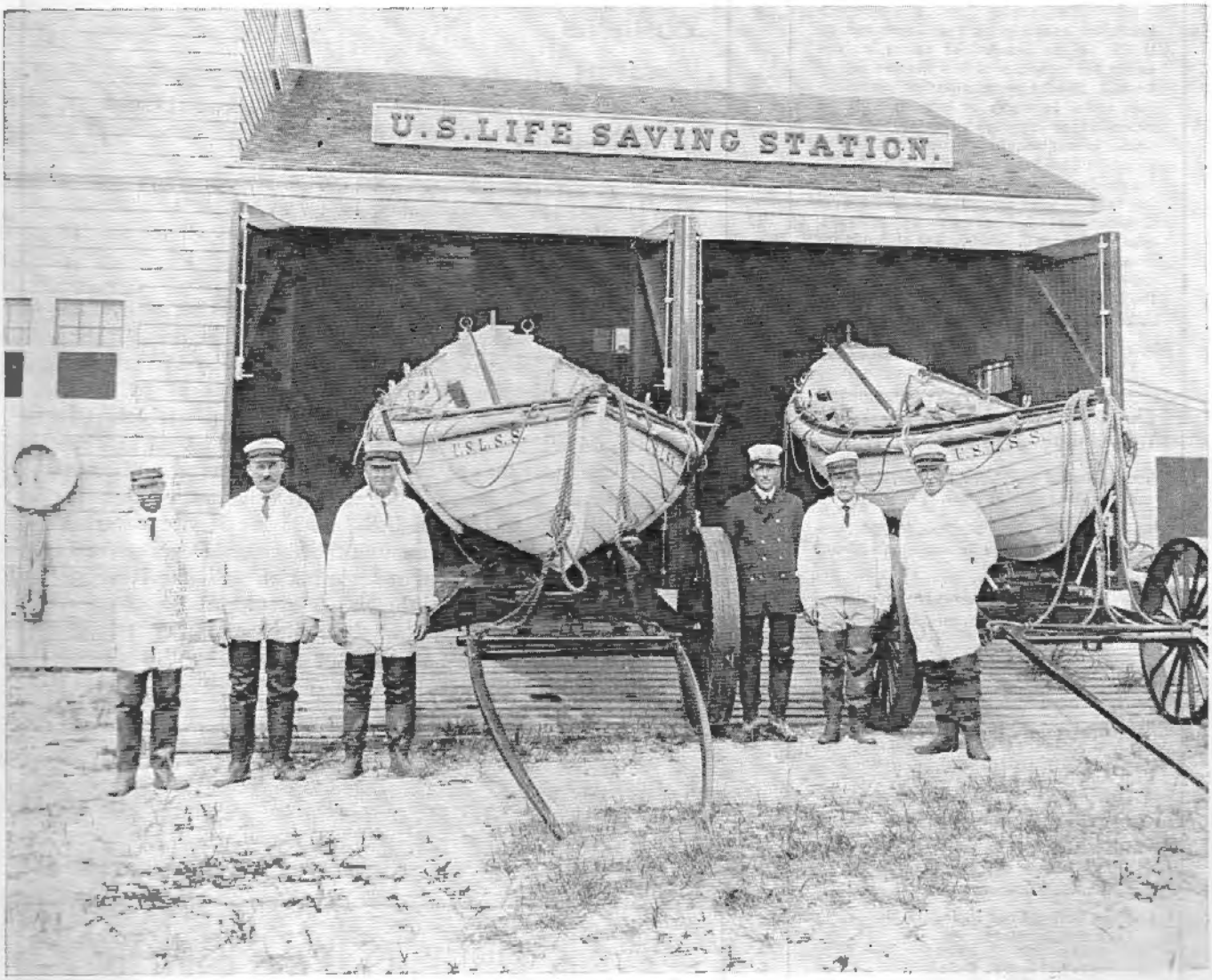
PROCEEDINGS
OF THE MARINE SAFETY COUNCIL



DEPARTMENT OF TRANSPORTATION UNITED STATES COAST GUARD

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PROCEEDINGS

OF THE MARINE SAFETY COUNCIL

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CONTENTS

COVERS

Front: Crew and boats of the U.S. Life-Saving Station, Salisbury Beach, Mass., *c.* 1900. *Back:* "The Self-Righting Life-Boat," one of a series of engravings by M. J. Burns, published in the old *Harper's Weekly* in the late 1800's.

The first lifeboat station in America was established by the Massachusetts Humane Society at Cohasset in 1807. Throughout that century, the Federal Government became increasingly involved in the support of volunteer lifesaving efforts, until in 1878 the U.S. Life-Saving Service was established as a separate bureau of the Treasury Department. In 1915, the merger of that organization with the Revenue-Cutter Service created the U.S. Coast Guard.

The proud history that these lifesavers brought to the service is well illustrated by the account on this month's "Heritage" page.

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A: acde(2); fghklmntuv(1)
B: n(40); c(16); e(5); f(4); ghj(3); r(2); bkipq(1)
C: egmp(1)
D: i(5); adgklm(1)
E: mn(1)
F: kp(1)
Lists TCG–06, CG–13, CG–20

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maritime sidelights

HOT WORK PERMITS

On a waterfront facility at a Mississippi River port, it was decided that a dip stick needed to be installed in a 165 gallon oily slop retention tank. The facility owner applied for and obtained from the Coast Guard Captain of the Port a "Hot Work Permit" to perform the installation.

The welder opened a drain cock on the bottom of the tank and found an oil and water residue. Because the tank was used to drain the drip pan serving a #6 fuel oil transfer line, he assumed that the tank contained only #6 fuel oil and some water. He drilled a 3/8-inch hole in the top of the tank, then struck an arc with a welding torch near the hole, and the tank exploded. Fortunately the welder was unhurt, but the contents of the tank (approximately 80 gallons) were spilled into the river. Investigation of the explosion revealed that the tank contained a mixture of No. 6 fuel oil, No. 2 fuel oil, and gasoline!

What went wrong here? Principally, it must be recognized that a "Hot Work Permit" issued by the Captain of the Port will not prevent an explosion or even make the "hot work" legal unless the requirements thereon are *strictly* adhered to. The requirement that would have prevented this explosion reads as follows:

> "Flammable vapors, liquids or solids must first be completely removed from any container, pipe or transfer line subject to hot work. *Tanks* used for storage of volatile substances must be tested and *certified* gas free prior to starting hot work."

Other requirements on the permit were not complied with; however, they did not contribute to the explosion.

Before permitting hot work, it is mandatory that the welding foreman or welder and the facility superintendent make a joint inspection of the immediate and adjoining areas to insure compliance with the permit.

MINI CHAIN

A mini Loran-C navigation system was demonstrated to Coast Guard observers in early April with significant success. The system, which consists of four low-powered transmitting stations deployed in a short base line configuration and prototype shipboard guidance equipment, is being developed by the Offices of Marine Environment and Systems, Research and Development, and Engineering as a precision all-weather radionavigation aid for use by commercial ore carriers on the St. Marys River, located between Lake Huron and Lake Superior. Although the demonstration utilized a Coast Guard vessel instead of a commercial ore carrier and was limited in scope, it gave all indications that the system will provide the ± 25 feet positional accuracy believed necessary for ships of up to 1,000 feet in length and 100 feet in beam, to transit the river which has some channels narrower than 300 feet. The shipboard Precision Guidance System (PGS) used during this demonstration eliminated the hand plotting of Loran-C time differences by presenting the positional information in terms of distance to next way point (channel intersection), along track speed, cross track distance (from desired track), cross track speed, and bearing of track.

A second generation prototype PGS will be delivered and evaluated this summer aboard Coast Guard and commercial vessels. It will present the above guidance information in addition to time next turn, next track bearing, attitude of ship in the channel, and lead distance (start turn point with respect to the next way point). A graphic display will show the shore outline, desired track, buoys, any other significant features, and a ship outline, all in proper position, orientation, and scale.

A system such as this is needed on the St. Marys River, especially during the winter when the Coast Guard icebreakers keep the river open but most of the buoys must be removed due to ice conditions. It will also be utilized as a research and development tool to evaluate the concept of a Loran-C mini chain for precision navigation and will serve as the stage for further development of Precision Guidance Systems.

MARINE INVESTIGATION

On 25 June 1976 the Marine Investigation Division was established within the Office of Merchant Marine Safety. Rear Admiral W. M. Benkert formally dedicated the new division which is headed by Captain Alfred E. Hampton.

This reorganization at the Headquarters level consolidates the investigative functions of the Marine Safety Program which were formerly within the divisions of Merchant Vessel Personnel and Merchant Vessel Inspection. In addition a branch has been formed specifically to perform safety evaluation. The creation of the new organization was brought about by the growth of responsibilities related to the investigatory role in the marine safety field and the increasing awareness of a requirement for a division in the Office of Merchant Marine Safety wholly dedicated to the investigative function and the review, evaluation and follow-up processes necessary to instigate corrective safety measures. One of the primary functions of this division will be to insure a higher quality of investigative work throughout the marine safety field and provide a strong base of leadership and support for investigative activities. The Marine Investigation Division will prove to be an asset to objectives of the Coast Guard's marine safety mission.

Maritime Personnel Training: A Professional Viewpoint

by George Blumberg

Vice-President, Adcom International

Basics Don't Change

The loadstone made way for the gyrocompass, wooden hulls yielded to steel, and the days of sail gave way to the age of coal. But the basic tools of seamanship endure: the skills of men who earn their living from the sea, along with sound human judgment, will never be obsolete.

Modern equipment systems have not changed the basic relationship of man, vessel, and sea. They do, in many ways, complicate that relationship. Systems are designed to get specific jobs done "better," and/or "faster." But they can't do so by themselves. *Men* must operate them. To successfully manage vessel systems, personnel must be equipped with knowledge, skill, and positive job motivation. These factors can be provided through effective personnel training.

Understanding the People

The development of effective personnel training begins with an understanding of the individuals to be trained—how they are equipped to meet the demands imposed upon them by their shipboard jobs and by the unique shipboard environment. A method is available by which we can approach an understanding of these people and combine this knowledge with established principles of education and learning. This method is called the systems approach to training.

Systems Approach to Training

The systems approach is a useful framework from which to analyze a training task. In its simplest form, the approach is concerned with:

(1) establishing training objectives;

(2) developing relevant training materials to meet those objectives; and

(3) evaluating to what degree these objectives have been achieved.

Establishing the correct training objective is the key to successful training. To do so, three basic factors must be examined:

(1) *job requirements*—the jobs to be done aboard ship;

(2) *personnel requirements*—what personnel attributes are necessary to do those jobs;

(3) *personnel qualifications*—how personnel measure-up to the requirements. We can determine that a "training deficit" exists if personnel qualifications do not match personnel requirements. Recognition of this deficit will make it possible to develop a training objective in a specific area.

Job Specification/Personnel Requirements

A job specification analysis is used to initially determine what tasks and related job behaviors are required aboard ship. Once these requirements have been established, a set of personnel characteristics which would aid a crewman in performing the job tasks can be identified. Personnel characteristics can be generally categorized into areas such as:

—specific job knowledge
—psychological/personality factors
—leadership factors
—motor skills
—intelligence and reasoning ability

For an example of how these factors might relate to a "real-life" situation, let's look at the job of Cargo Officer aboard an LNG vessel.

LNG Cargo Officer

In terms of specific job knowledge, this man must be thoroughly familiar with certain facts, procedures, and relationships. Such knowledge covers chemical and physical properties of the cargo, cargo containment systems, operational procedures and their relationship to codes and regulations, specifics of the cargo handling system, safety practices and equipment, the ship's emergency plan, etc.

In terms of personality factors, a man is needed who can hold up well under stress, a man who won't easily panic. In an emergency, he must act correctly and quickly. He should be a man confident in his own decision-making ability, able to carefully weigh several factors and make a decision. He must understand the meaning of leadership and personnel motivation, since he must direct operations and lead men.

Using this somewhat oversimplified description of an LNG officer's required characteristics as a yardstick, we can measure our real-life personnel against it. Measuring the individual against the standard requires verbal interviews with him, the application of written tests, and analysis of written historical records. This measurement process reviews psychological factors, personal factors, and job-related factors.

If measurement of the individual reveals a difference between the actual and required personnel factors a "training deficit" is said to exist. Eliminating this deficit becomes the training objective. For example, it might be found that he is lacking in leadership skills, as evidenced by test and interview results. The training objective would then be to provide him with a leadership skills training program.

Developing Training Materials

Instructional Design

Once training objectives are established, the design and development of training programs and materials can begin. Training programs relating to a single technical subject can be designed with various instructional formats. The instructional format design carefully considers the intended use of the program. Such uses fall into the following categories:

(1) *Individual instruction*—the individual acts as his own "teacher," proceeding through the material at his own pace;

(2) *Group instruction*—personnel are trained in groups, with a group training leader;

(3) *Refresher training*—training to enhance/reinforce knowledge personnel have already acquired;

(4) *Advanced training* — a "new," or more complex subject is introduced to personnel.

Presenting Information

A crucial initial step in developing a training program is obtaining accurate technical information. The developers of training material must have the ability to understand complex technical equipment and processes. They must know how to extract technical information from manuals and handbooks, from engineering data and test results, and from interviews with technical experts. This technical information must then be translated into language and concepts which will be readily understood by the personnel to be trained. Next, this information must be presented in a manner which is relevant and interesting to personnel. To be effective, training materials must provide accurate information, presented in an entertaining manner, which will motivate the personnel to internalize the information, and put it to use on the job.

To present the technical information meaningfully, you must know:

(1) the characteristics of the personnel to be trained; and

(2) the media to be employed

It is possible to identify certain factors about the audience—educational level, reading and comprehensive abilities, language handicaps/abilities, previous knowledge concerning a subject, personal interests, etc. This knowledge must then be combined with a professional ability to select and utilize the medium to the best effect for that audience.

Multi-Media Approach

Frequently, a combination of more than one medium is required to maximize training effectiveness. Multimedia techniques provide for selection from various types of printed and audio-visual materials. Particular training applications may call for media to be used singly, or in specific combination with one another. This is entirely consistent with the systems approach, which often supplies instructional material as a series of individual, specialized modules, which may consist of various media. These modules are self-contained units of instructional information, designed to reinforce one another, in a building-block concept of learning. This multimedia, modular method of instruction supplies appropriate material to the trainee, at the appropriate time. Each modular component of a training program paves the way and provides the foundation for the next module, while at the same time supporting and reinforcing the concepts previously presented.

Evaluating Achievement

The systems approach to training provides for objective evaluation, which seeks to determine whether the instructional objectives of the training program have been achieved. A carefully-designed objective test matrix is employed. By exposing personnel to this matrix after they have received the instruction, it can be determined if the material has been learned. By utilizing a "pre-test/post-test" format, personnel can be given the opportunity to test their knowledge before they are exposed to the instruction, and once again after exposure. This evaluation format provides an additional learning reinforcement aspect for the individual who is first alerted to look for knowledge about which he was initially unsure, and then is motivated to check his progress. Since the instructional material is of real use in everyday job operations, those operations can be adversely affected if the instructional information is not internalized. The evaluation can therefore alert us to action which must be taken to bring personnel knowledge into line with the instructional objective. Alternative courses of action might then be:

(1) Recycle trainee through the course until improvement is shown;

(2) Supplement with additional instructional material;

(3) Supplement with additional personalized instruction; or

(4) Make changes in the basic instructional material itself.

Shipboard Training

Background

Traditionally, landbased schools have been and are used to teach specific maritime subjects. They are

especially valuable when certain conditions at the school facility cannot be duplicated aboard ship. Examples of this are landbased schools utilizing computerized simulators to teach shiphandling, firefighting schools which use real equipment to fight real fires, and electronics schools with complex equipment installations.

While landbased training is important, it must be recognized that shipboard training concerning specific subjects has its role, as well. When the crew trains aboard ship, it does so in the real-life, working and living environment. There is no better way to provide a sense of immediacy and relevance, which may only be simulated for a time at the landbased facility. A sense of teamwork and esprit de corps is fostered aboard ship, since training takes place with shipmates. As an aid to learning the concepts taught aboard ship can be applied soon after the instruction has been administered.

Types of Shipboard Training

Shipboard training can be categorized into three general types: (1) "Outside" trainers; (2) Fleet trainers; (3) Self-contained training programs.

Outside onboard trainers are specialists hired by a fleet, as needed, to provide particular onboard training. These trainers ride the ships, in order to provide direct trainer/personnel contact. Much of this training can be categorized as the on-the-job type of training.

Fleet trainers, often called "port captains" or "operations inspectors," are regular employees of a fleet. They are assigned to visit and/or ride ships of the fleet and provide on-the-job training. The majority of this training is safety-oriented, such as demonstrations of firefighting equipment. Additionally, onboard fleet trainers are dispatched on a when-and-where-needed basis, for troubleshooting particular problems.

These traditional types of shipboard training are of proven value. This is especially so in a troubleshooting area, where a technical expert can be quickly flown to a ship to deal with an immediate concern. While fleet trainers are chosen for their technical expertise, it must be recognized that to function effectively as trainers, they must not only *have* the expertise, but be able to impart it to others.

A fleet's investment in onboard fleet trainers can be protected and enhanced by providing these men with training materials specially designed to support their shipboard instruction. Such materials may consist of audio-visual presentations, printed guides, bulletins, and charts. These aids will ensure that the trainer makes his points most effectively and understandably—especially if his language differs from that of his audience. Training materials which he can leave behind for subsequent crew use are valuable.

Self-contained training programs do not require outside or fleet trainers. These programs consist of carefully designed and integrated multi-media materials, developed through the systems approach to training. They are designed to foster learning by interaction of the trainee with the training materials. To assure that this vital interaction takes place, a "training leader" is required. Since few seamen are instructors, self-contained training programs must include carefully-structured training leader guides, specifically geared to each subject. These guides permit ship's officers or licensed promotable crew—persons already onboard the vessel—to comfortably assume the role of training leader within a specific subject area. These guides must provide a complete structure for each training session—this includes instructions for presenting the actual training material, for conducting discussion meetings, and for testing.

Training Subjects

Self-contained training programs can cover a wide range of shipboard training subjects. Over time, a useful onboard library of training programs on various topics can be accumulated. Subjects may be classified in the following areas:

(1) *Equipment—Theory and Operation.* Knowing the theory of operation of any type of equipment provides a high degree of assurance that the equipment will be operated properly, helping to prevent damage, and need for premature replacement. A basic understanding of how equipment operates is vital to efficient operations.

(2) *Equipment — Maintenance/Troubleshooting/Repair.* Proper preventive maintenance can reduce premature equipment wear, breakdown, and excessive downtime. Once equipment is down, a knowledge of troubleshooting and repair can get it back in operation quickly.

(3) *Safety.* Safety is everyone's business aboard ship; the safety of the vessel affects everyone. Safety areas range from good housekeeping, through firefighting, and survival at sea.

(4) *Operations Procedures.* Personnel may need an enhanced grasp of operational procedures. Do they know the general objective, scope, phases, and precautions that accompany every operation? Are they familiar with their individual roles, and how they work as a team?

(5) *Basic Skills.* As personnel come on board, are they sufficiently trained in the basics? Or do they need strengthening in areas of basic seamanship, or other basic skills, such as are welding, or machine shop practices?

(6) *Pollution Avoidance/Environmental Controls.* With tightening local, state, national, and international regulations and enforcement, this subject is of major concern. Are officers and crew alike familiar with the regulations which affect them?

(7) *Shipboard Management/Interpersonal Relations.* New marine technologies mean new areas of specialization aboard ship. To effec-

(*Continued on page 164*)

COAST GUARD RULEMAKING

(Status as of 1 August 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			
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				
Safe loading and flotation standards (CGD 75-176)	5- 6-76		6-21-76	X			
Low- and non-powered boat capacity (CGD 74-268)	6-24-76		8-24-76				
BRIDGE REGULATIONS							
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			
Clearwater Pass, FL (CGD 74-299)	8-12-75		9-12-75			7- 1-76	7-30-76
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			6-10-76	7-12-76
Lake Champlain, VT (CGE 75-222)	12- 8-75		1- 9-76	X			
Shrewsbury, NJ (CGD 75-241)	2- 2-76		2-20-76			6-24-76	7-29-76
Missouri R. IA (CGD 75-244)	2-26-76		3-12-76	X			
Mitchell River, MA (CGD 76-014)	2-19-76		4- 5-76	X			
Old Brazos River, TX (CGD 76-024)	3-11-76		4-12-76			7-29-76	8-30-76
Housatonic River, CT (CGD 76-034)	3-15-76		4-20-76	X			
Menominee River, WI (CGD 76-069)	4-22-76		5-25-76				
Bayou Teche & Bayou Plaquemine, Brule, LA (CGD 76-093)	5-27-76		6-29-76				
Bayou Boeuf, LA (CGD 76-068)	6-14-76		7-20-76				
Bayou Lafourche, LA (CGD 76-077)	6-14-76		7-20-76				
Sabine Lake, TX (CGD 76-112)	6-24-76		7-26-76				
Clear Creek, TX (CGD 76-111)	6-24-76		7-30-76				
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			
Visual identification of tank barges (CGD 75-093)	2- 5-76 Corrected 2-23-76		3-16-76	X			
Anchorages, Port of New York (CGD 74-194)	3- 1-76		4-15-76	X			
Anchorages, Boston Harbor, MA (CGD 76-40)	3-29-76		5-14-76	X			
Navigation safety regulations (CGD 74-77)	5- 6-76 Corrected 5-13-76	6-11-76 Wash. 6-17-76 San Fran.	8- 6-76				
Tug assistance (CGD 76-025); Advance notice	5- 6-76 Corrected 5-13-76		8- 6-76				
Minimum net bottom clearance (CGD 76-051); Advance notice	5- 6-76 Corrected 5-13-76		8- 6-76				

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							
Regulated navigation areas, Apra Outer Harbor, Guam (CGD 74–281)	5–17–76	.....	6–16–76	X	.....	.....	.....
Anchorages, Puget Sound area, WA (CGD 76–039)	6–10–76	.....	7–26–76	....	.....	.....	.....
New Orleans Vessel Traffic Service (CGD 75–112)	6–17–76	.....	8– 2–76	....	.....	.....	.....
Anchorage, Scituate Harbor, MA (CGD 74–193)	6–21–76	.....	8– 5–76	....	.....	.....	.....
Anchorage ground, Hampton Roads, VA (CGD 76–037)	8– 8–76	.....	8–23–76	....	.....	.....	.....
Naval anchorage grounds, Waimea, HI (CGD 74–187)	8– 8–76	.....	8–23–76	....	.....	.....	.....
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	.....	6–15–74	X	.....	.....	.....
	Supp. Notice 12– 1–75	.....	1–16–76	X	.....	.....	.....
Metal boring, 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	.....	.....	.....
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	....	.....	6–24–76	7–26–76
Unmanned barges carrying certain bulk dangerous cargoes (CGD 75–226)	3–15–76	.....	4–29–76	X	.....	.....	.....
Elevators and dumbwaiters, ANSI Code (CGD 75–001)	4– 5–76	.....	5–21–76	X	.....	.....	.....
Noncombustible materials for merchant vessels (CGD 74–129)	4– 5–76	.....	5–21–76	X	.....	.....	.....
Vapor recovery systems in cargo transfer operations (CGD 75–208); Advance notice	4– 5–76	.....	6–21–76	X	.....	.....	.....
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	X	.....	.....	.....
Measurement of vessels (CGD 75–078)	4–22–76	.....	6– 7–76	X	.....	.....	.....
Segregated ballast, certain existing tank vessels (CGD 76–075)	5–13–76	.....	6–30–76	X	.....	.....	.....
Lifesaving equipment for Great Lakes vessels (CGD 76–033); Advance notice	6– 7–76	.....	9– 7–76	....	.....	.....	.....
Bulk dangerous or extremely flammable liquid cargoes (CGD 73–096)	6–24–76	8– 3–76	8–20–76	....	.....	.....	.....
Commercial diving occupational safety and health standards (CGD 76–009); Advance notice	7–15–76	.....	8–16–76	....	.....	.....	.....
Semi-portable CO_2 systems testing (CGD 75–225)	7–26–76	.....	9–10–76	....	.....	.....	.....
Integral diesel fuel tanks, small passenger vessels (CGD 75–184)	7–26–76	.....	10–26–76	....	.....	.....	.....

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

"They Are All Gone"

By Chief Marine Science Technician Dennis L. Noble, USCG

"SURFBOAT filled with us aboard a mile outside. All but myself perished before we were driven ashore." This terse telegram described the end of a most tragic event in the history of the U.S. Life-Saving Service, a predecessor of today's Coast Guard.

The dramatic story begins on 22 April 1880, with the scow *J. H. Magruder* of Port Huron, Michigan, bound for Detroit with a cargo of lumber. As she plowed through Lake Huron, all was proceeding quietly. At 2200, the skipper of the *Magruder* logged the wind as "east, light, but breezing up." To be safe, Captain Conkey took in the gaff topsails.

Within the next two hours, everything wrong that could befall a mariner seemed to happen to Captain Conkey. First, the scow began "listing bad to starboard" with the "lee rail under water." Next, the vessel began "leaking badly with about two feet of water in the hold." Then the weather began to kick up, buffeting the scow with high winds and heavy seas. Finally, to top everything off, it became clear to the skipper that the vessel would not clear the bar near Point Aux Barques, Michigan.

At 0200 the next morning, Captain Conkey decided to anchor in the hope that this would hold his ship and put her on an even keel. He only partially succeeded. The *Magruder* righted, but with every surge of the lake, she began to drag anchor, "with the sea breaking over her hows."

Captain Conkey later stated: "I greatly feared the vessel would be lost, and that our lives were in great danger, if assistance was not rendered." He then ordered a red light hung in the main rigging for the Point Aux Barques Life-Saving Station.

The beach patrol did not spot the signal. At dawn, Captain Conkey had the flag displayed at "half mast, union down" and the lookout, Surfman James Nantau, spotted the distress signal.

Keeper Jerome G. Kiah, the man in charge of the station was sleeping when Nantau brought word of the distress. Kiah hurriedly dressed, checked Nantau's sighting, and then called out all hands. The surfboat was run out on the launchway, and the crewmen donned their cork lifejackets.

At this juncture, the events of that fateful day can best be related by quoting Kiah's log.

> . . . we shoved off with all hands in their places in the boat. After getting outside the reef we found the sea heavier with an occasional very heavy one. We dodged and weathered them all right until within about ¼ mile from scow and nearly one mile distant from nearest point of land. Suddenly, I noticed a very big sea coming for us. There was only time to straighten her so that she might take it head on, but it proved to much for her. It came aboard and completely filled her. As the sea was leaving I gave the orders to bail, (we had two bailing dishes aboard) but the men saw that her gunnals were too far below water as soon as the sea had left us. In a few minutes after she broached to and rolled over with us. We righted her and tried to work one of the oars to get her stern to the sea, but it was impossible her gunnals being so far below water and in a few moments she rolled over again. We righted her again but with the same result. I am not positive whether we righted her again or not,

but if we did not I think the seas rolled her over several times, but of this I am not sure. All seemed to have hopes at first that we could hang on until we got to the reef. Where we thought we might touch bottom and right her up, and get the water out. At the time she filled we were distant from the reef about ½ mile. [A]bout ¾ of hour after filling Surfman Pattinger gave out. From that time until the last man finished—I think it was about ½ hour, they all seemed to go in the same way, gradually going off in a stupor—something like being chloriformed—with one exception they were all holding on the boat by the life lines or fenders when they gave up. Slowly their faces would drop forward until they touched the water and in a few moments after their holds would relax and . . . the boat would slowly drift away from them. The exception was Surfman Morrison, he let go his hold or was washed away. When I noticed him, he was five or six feet from the boat seemingly unconscious, his face was slowly dropping. I sung out to him calling him by name, but he never showed any sign that he heard me and in a moment or two I saw it was all over with him. Surfman Dugan was the last one to give up. Up to this time my memory serves me very good. This must have been about 7 AM. From this time until about 12 noon I can remember only very little that transpired. I was found on the beach by Mr. S. McFarland and Mr. A. Shaw about 9.30 AM.

Later, Keeper Kiah related to an interviewer: "I was conscious only at brief intervals. I was not suffering, had no pain, had no sense of feeling in my hands, felt tired, sleepy and numb. At times I could scarcely see. I remember screeching several times, not to attract attention, but thought it would help the circulation of the blood. I would pound my hands and feet on the boat whenever I was conscious. . . . I remember . . . in . . . a dreamy way of when I reached shore; remember falling down twice, and it seems as if I walked a long distance between the two falls, but I could not have done so, as I was found within thirty feet of the boat."

Lighthouse keeper Andrew Shaw and Samuel McFarland, a local farmer, found Kiah nearly dead on the beach. Both men helped him back to the station. McFarland later said Kiah would murmur, "Poor boys, they are all gone."

On board the *Magruder*, meanwhile, Captain Conkey ordered his crew to start throwing the deck cargo over the side. By noon he had lightened her enough that even though leaking badly, she managed to limp safely into Sand Beach, Michigan. When asked at an investigation if his lifeboat was in sufficient condition to help the distressed men in the water, Captain Conkey replied: "Our boat was in good condition. No ordinary yawl boat could live in such a sea."

Even though Kiah survived the waters of Lake Huron, he could not escape the memory of the events. His terse entry in the log: "Crew all cold in death. With the exception of Keeper" is an indication of how the events haunted his mind. Keeper Kiah was finally forced to resign his position, for the memory of the disaster would not let him perform his duties.

As the bodies nf the crew were laid to rest, the Superintendent of the Tenth Life-Saving District, Joseph Sawyer, conducted an investigation, as required by regulations. Sawyer stated that he could "lay the blame at no one's door. It was one of those unfortunate accidents that are liable to occur with the best of men and under the best management, but not likely to occur twice in a lifetime." Sawyer went on to state the crew was well trained and related that earlier in the year had rescued "nearly a hundred lives."

Superintendent Sawyer felt so strongly about this rescue attempt that, in a letter to the Live-Saving Service Headquarters in Washington, he recommended "for the first time since the organization of this District" that Keeper Kiah be considered for the gold lifesaving medal—the highest award of the Service. Apparently Washington felt the same as Sawyer, for on 8 November 1880, ex-Keeper Jerome G. Kiah received the award.

Perhaps the best expression of the devotion and sense of duty towards one's fellow man shown by these men of the Life-Saving Service was that of another keeper, who later lost his life in a rescue attempt. When asked why a crew put out into such fearful storms, he replied: "We must go. There is a distress flag in the rigging."

(*Continued from page 160*)

tively administer these new systems, the concepts of the management "team," and "management by objectives" are being applied to shipboard management. Shipboard management is more and more viewed as an extension of shoreside management, in terms of the sharing of corporate concerns and goals, and the effectuating of corporate policy.

Summary

The changing technological nature of the maritime industry means that new and often complex relationships are developing—relationships of men to machines, and of men to other men.

Marine personnel are expected to safely manage substantial investments in cargoes and vessels, while operating within the demanding structure of the unique shipboard environment. Effective training can equip these personnel with the knowledge, skills, and positive job motivation necessary to meet the demands of their jobs. But effective training is not simply achieved. Developing effective training requires a careful, professional consideration of the individuals to be trained, and the specific knowledge and ability to translate training needs into useful materials. ‡

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) (5–1–75).
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, 6–10–76.
*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, 6–10–76.
190	Equipment Lists (5–1–75). F.R. 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, 5–6–76, 6–10–76, 6–21–76, 6–24–76.
*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, 7–26–76.
*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, 5–6–76.
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, 6–3–76.
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, 6–10–76.
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.
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 JULY 1976

CG–191, Federal Register of July 26.

*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.

THE SELF-RIGHTING LIFE-BOAT.