PROCEEDINGS
OF THE MARINE SAFETY COUNCIL

Vol. 37, No. 3

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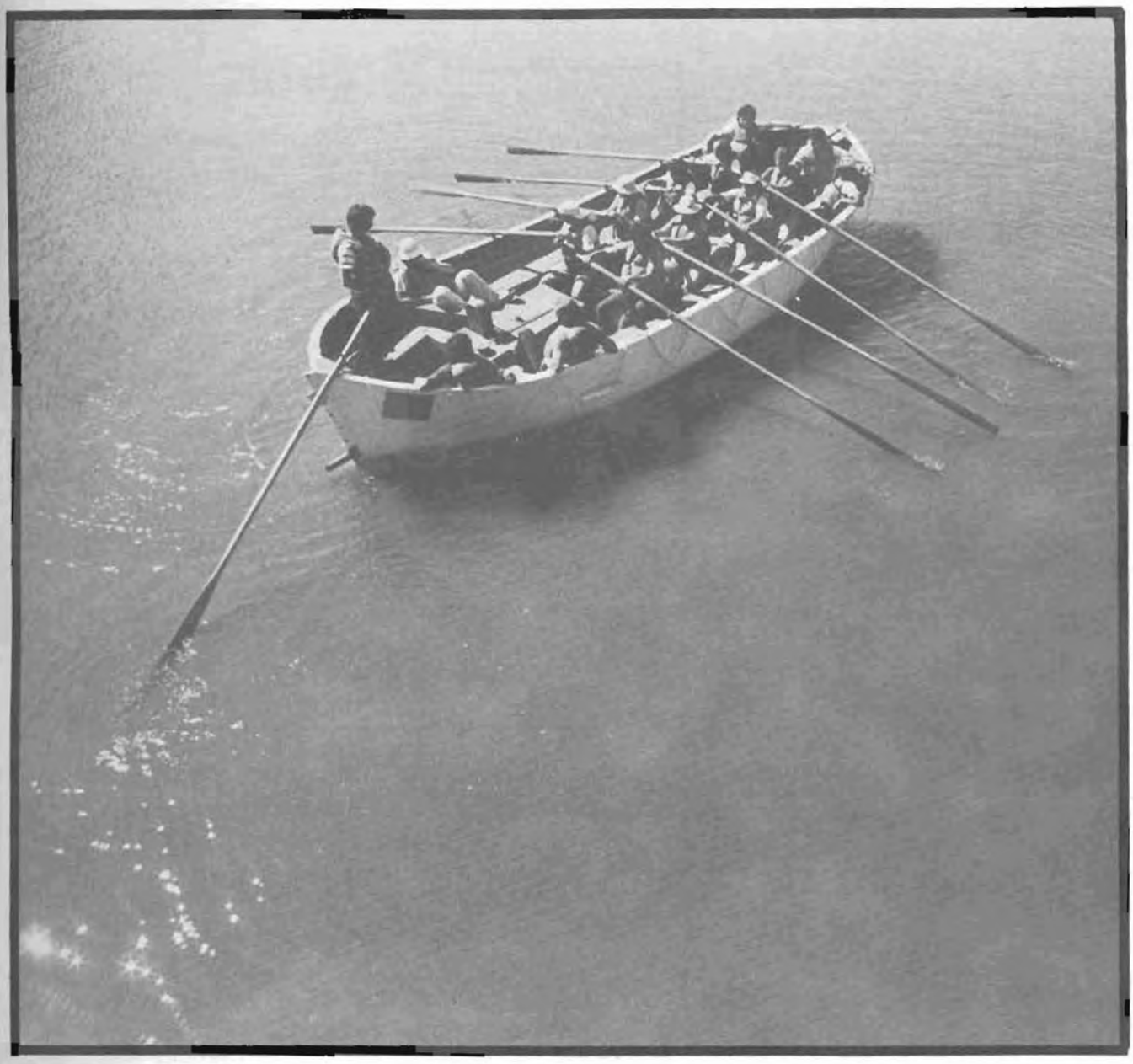

U.S. Department of Transportation
U.S. Coast Guard

CG-129

PROCEEDINGS
OF THE MARINE SAFETY COUNCIL

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THIS COPY FOR NOT LESS THAN 20 READERS— PLEASE PASS IT ALONG

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Cadet engineers of the Calhoon MEBA Engineering School must complete a 56-hour lifeboat course at the school's eastern shore facility. At least 30 hours are spent in a lifeboat in the water. Additionally, seminars on safety of life at sea are conducted periodically at the Baltimore campus. Read more about the Calhoun MEBA School beginning on page 56.

maritime sidelights

AMERICANS CREW
FOREIGN-FLAG LNG SHIP

A novel twist in the manning of a liquefied natural gas (LNG) vessel occurred recently when the El Paso LNG Company replaced the SONATRACH with American seamen in lieu of Norwegian seamen. The SONATRACH is one of three LNG vessels, owned by the El Paso LNG Company, which have been operating under Liberian registry. The company operates three more U.S.-flag LNG carriers under collective bargaining agreements with the Seafarers International Union (SIU).

In 1978, El Paso LNG Company began its "Algeria I" LNG transportation project with three American and three Norwegian-crewed, Liberian-registry vessels. Although the vessels made essentially the same voyage between Algeria and the East Coast of the United States, the Norwegian-crewed vessels spent considerable time in the shipyard, undergoing repairs.

According to a company spokesman, the El Paso LNG Company chose to change over to all American crews because it was felt they would have better control over operations. The company spokesman also stated that the American seamen are well trained to handle the LNG vessels. The SIU seamen aboard the LNG carriers have been specially trained at the Harry Lundeberg School, a joint union-management school, where LNG-vessel instruction has been offered for several years.

In addition to the SONATRACH, SIU crews will soon man the other two El Paso LNG Company foreign-flag vessels, the CONSOLIDATED and the PAUL KAYSER. Presently, the company has under construction three more LNG vessels scheduled to fly the American flag.
(Reprinted from the January issue of the Transportation Institute Currents)

MARAD MARINE
FIREFIGHTING MANUAL
AVAILABLE

The Maritime Administration (MARAD) has recently published a 376-page manual covering marine fire prevention, firefighting and fire safety. The MARAD manual contains detailed firefighting techniques, discusses both causes and prevention of shipboard fires, and outlines fire prevention programs. The manual may be purchased for $8.00 per copy from:

U.S. Government Printing
Office
Washington, DC 20402

Ask for No. 003-007-000-99-5.

TRANSPORTING CHEMICALS
SAFELY

The Chemical Manufacturers Association has released a broad-ranging transportation safety report which describes the chemical industry's efforts to assure greater safety in the transportation of its products. Copies of the report, "Transporting Chemicals Safely: What We're Doing About It," can be obtained from the association at 1825 Connecticut Ave., NW, Washington, DC 20009 or by calling (202) 328-4282.

GREEN OR BLACK
BEST BUOY COLOR?

The U.S. Coast Guard plans a nationwide, year-long test to evaluate whether green buoys can be seen better and their color recognized by mariners at greater distances than traditional black buoys.

Test sites throughout the United States have been selected to cover as many types of water conditions, visual backgrounds and classes of users as possible.

Green markings now in use on beacons in the United States have received wide acceptance from mariners. In addition, green buoys have been used for some time outside of North America for various purposes and have proven effective. The special one-year evaluation will attempt to verify if, for U.S. applications, green is more effective than black as a day signal color for buoys.

Green test buoys will begin to appear at various locations between March 1, 1980 and May 31, 1980. These buoys and their locations are:

Providence River Approach Channel in Rhode Island, Lighted Buoy 7

Providence River Channel in Rhode Island, Buoy 21

Upper Mississippi River in the vicinity of St. Louis, Missouri, two specially-deployed test aids

Sandy Hook Channel in New Jersey, Lighted Gong Buoy 5

Deepwater Point Range in Delaware, Lighted Bell Buoy 5D

Craney Island Channel in Virginia, Lighted Buoy 19

Bloody Point Range in Georgia, Lighted Bell Buoy 7

Miami Main Channel in Florida, Lighted Buoy 3

Pascagoula Channel in Mississippi, Lighted Buoy 21

Kelso Marine Terminal Channel in Texas, Buoy 55

East Outer Channel in Michigan, Buoy 5

Green Bay Harbor Entrance Channel in Wisconsin, Lighted Buoy 31

San Diego Bay Channel in California, Lighted Buoy 9

Astoria Crossing in Oregon, Lighted Buoy 37

Swinomish Channel in Washington, North Entrance Buoy 17

Hilo Harbor in Hawaii, Lighted Buoy 3

Wrangell Narrows Channel in Alaska, Buoy 13A

Womens Bay Entrance Channel in Alaska, Lighted Bell Buoy 3

Mariners are encouraged to compare the two colors and send comments in writing to the Coast Guard Aids to Navigation Branch at the nearest Coast Guard District Office. *(Reprinted from the Houston USCG Port Safety Station Marine Safety Newletter)*

The highlights of this month's Coast Guard rulemaking efforts are the final Pollution Prevention Regulations and the Supplemental Notice of Proposed Rulemaking on SUBCHAPTER J, ELECTRICAL ENGINEERING. The POLLUTION PREVENTION REGULATIONS (CGD 75-124A) appeared on 31 January and became effective 3 March 1980. More recently published (3 March 1980) was the Supplemental Notice on the ELECTRICAL ENGINEERING REGULATIONS (CGD 74-125A), which established a comment period until 17 April 1980.

Additional final rules include the 14 February 1980 final rules on WELDING AND BRAZING (CGD 80-04) and ELIMINATION OF WRANGELL AND SITKA, ALASKA AS PORTS OF DOCUMENTATION (CGD 79-060), and the 11 February rules on SAFETY ORIENTATION OF PASSENGERS (CGD 78-009).

Great Lakes mariners should note that the new Great Lakes Pilotage regulations (CGD 79-138) were published on 28 February. All maritime organizations should note that a MEMO OF UNDERSTANDING has been published between the Coast Guard and the Occupational Safety and Health Administration (OSHA). This item was published on 11 February 1980.

Several proposed rules were published during the last month. The first of these, the proposal for the DEEPWATER PORT SAFETY ZONE (CGD 76-096), was published on 14 February. On 21 February the proposed rules for ELECTRONIC RELATIVE MOTION ANALYZERS (CGD 79-148) were published, followed on 28 February by the proposed rules for TRANSPORTATION OF UNSLAKED LIME (CGD 79-141).

One significant new rulemaking project has been initiated since the last issue. This project, entitled PERSONNEL SAFETY AND HEALTH REQUIREMENTS FOR INDUSTRIAL VESSELS (CGD 80-15), is similar to CGD 79-077, Personnel Job Safety Requirements for Fixed Installations on the Outer Continental Shelf (OCS), in that it deals with OCS safety. This project, however, deals not with the fixed installations but with the vessels engaged in exploration and support operations.

There has also been a withdrawal published since our last issue. On 11 February the Coast Guard withdrew the advanced notice on the NEW ORLEANS VESSEL TRAFFIC SERVICE (VTS), holding the project until the Lower Mississippi River Traffic Study is completed. After completion of the study and its evaluation, Coast Guard action will be resumed.

Any questions regarding regulatory dockets or companies and individuals wishing to speak at public hearings should notify Capt. P. J. Danahy (G-CMC/24), U.S. Coast Guard Headquarters, 2100 Second St. SW, Washington, DC 20593; (202)426-1477.

* * *

QUALIFICATIONS OF THE PERSON IN CHARGE OF OIL TRANSFER OPERATIONS, TANKERMAN REQUIREMENTS
CGD 74-44, 74-44a

These regulations will redefine and establish qualifying criteria for the certifying of individuals engaged in the carriage and transfer of dangerous cargoes in bulk.

It has been found that most pollution incidents are the result of personnel error; consequently, the minimum qualifications of persons involved in handling polluting substances should be specified.

As stated in the last issue, these projects have been withdrawn (44 FR 25243). New notices of proposed rulemaking (NPRM's) which were anticipated in June have been delayed and are now scheduled for publication in April of this year under new Coast Guard docket numbers 79-116 and 79-116a.

REVISION OF ELECTRICAL REGULATIONS
CGD 74-125

This regulation will constitute a general revision and updating of the electrical regulations to conform with latest technology. It will include steering requirements for vessels other than tank vessels.

This revision is occurring because industrial standards for electrical engineering have changed in the past few years, and the regulations must be brought up to date to reflect current industry practices.

An initial NPRM was published on 27 June, 1977 (42 FR 32700). A supplemental NPRM was published as CGD 74-125A on 3 March, 1980 (Part VII).

NEW TANK BARGE CONSTRUCTION
CGD 75-083
UPGRADE OF EXISTING TANK BARGE CONSTRUCTION
CGD 75-083a

This action is comprised of two regulatory projects centered on tank barge construction standards. These projects were the result of a Presidential initiative of 17 March 1977, directing a study of the tank barge pollution problem. One project will address new barge construction while the other will pertain to existing barges. Regulatory documents for both will be published at the same time and joint public hearings have been held.

In July 1977, the Coast Guard began a reexamination of the tank barge construction standards. It was determined that new construction would be treated separately from existing barges. An advance notice of proposed rulemaking (ANPRM) was then issued to gather additional data and assess impacts related to existing barges.

The new NPRM on tank barge construction, withdrawing the prior NPRM and the ANPRM for existing tank barges, was published as part VI of the 14 June 1979 Federal Register (44 FR 34440 and 44 FR 34443, respectively).

Public hearings were held on the dockets as follows: 2 August 1979,

Continued on next page.....

Washington, DC; 15 August 1979, Seattle, WA; 23 August 1979, New Orleans, LA; 5 September 1979, Washington, DC; and 7 September 1979, St. Louis, MO. The comments given at the hearings have been incorporated in the docket.

On Thursday, 8 November 1979 a Federal Register notice extended the comment period on the project. This extension was based on the continued public interest and ran to 1 December 1979.

This extension has expired and no further comments will be accepted. A final rule on Tank Barge Construction (CGD 75-083) and an NPRM on Existing Tank Barges (CGD 75-083A) have been postponed pending a study by the National Academy of Sciences. A notice of intent indicating the actions that the Coast Guard plans to take is in clearance at the time of this writing and should be published during March.

Anyone wishing to obtain copies of the rulemaking may do so by contacting Capt. P. J. Danahy, Marine Safety Council (address is given in the introduction to the Keynotes section).

POLLUTION PREVENTION, VESSELS AND OIL TRANSFER REGULATIONS CGD 75-124a

This regulation would reduce accidental or intentional discharge of oil or oily wastes during vessel operations.

The basis of this regulation is threefold. First, there is the need to reduce the number and incidence of oil spills. Second, this regulation will help to clarify the existing rules. Finally, this regulation covers the additional requirement for oil-water separators under the 1973 International Convention for the Prevention of Pollution from Ships.

The NPRM was published on 27 June 1977 (42 FR 32670). A supplemental NPRM was published 27 October 1977 (42 FR 56625) and the final rule was published on 31 January 1980 (95 FR 7156).

DESIGN AND APPROVAL REQUIREMENTS FOR OIL POLLUTION PREVENTION EQUIPMENT CGD 76-088a

These regulations set out specifications and procedures for approving oil-water separators, cargo monitors, bilge monitors and bilge alarms for use on merchant vessels. They are based upon international design and test specifications adopted by the International Maritime Consultative Organization (IMCO) as Resolution A-393X, and provide standards for equipment that is representative of the best technology presently available.

The final rule, published in the 13 September 1979 Federal Register (44 FR 53352), requires that performance testing of prospective equipment must be done by one of the independent testing laboratories designated by the Commandant (G-MMT). The following laboratories have received authorization to commence testing:

Underwriters Laboratories
Tampa, Florida, USA

National Sanitation Foundation
Ann Arbor, Michigan, USA

University of New Castle
New Castle Upon Tyne, UK

The following three regulations, CGD 77-057, CGD 77-058(b)(c)(d), and CGD 77-063, make up the Tanker Safety and Pollution Prevention (TSPP) Regulations. Public hearings have been held on the package, comments were requested and 541 have been received. A notice of delay in publishing the final regulations was published in the 7 June 1979 Federal Register (43 FR 32713). Final rules have been published and appeared in the 19 November 1979 Federal Register (44 FR 66500).

INERT GAS SYSTEM CGD 77-057

This regulation would require certain oil tankers of 20,000 deadweight tons and over to be fitted with inert gas systems.

As part of the President's initiatives to reduce marine pollution, this regulation will reduce the possibility of in-tank explosions which have been the cause of some pollution incidents.

The Inflationary Impact Statement for this regulation was completed in May 1977. An NPRM was published 12 February 1979 (44 FR 8984). Hearings were held 21 March 1979 in Washington, DC and 28 March 1979 in San Francisco, CA; 136 comments were received, have been evaluated, and the final rule has been published.

SEGREGATED BALLAST AND TANK CLEANING REGULATIONS GCD 77-058(b), (c) and (d)

This four-part regulation was initiated when President Carter directed the Secretary of Transportation to issue new rules for oil tanker standards, which were to include segregated ballast on all tankers and double bottoms on all new tankers which call at American ports. The provisions of these proposed regulations have been changed by the February 1978 Intergovernmental Maritime Consultative Organization (IMCO) Conference to include Crude Oil Washing (COW) and Clean Ballast Tanks (CBT).

The NPRM was published 16 May 1977 (42 FR 24868). As a result of the IMCO Tanker and Pollution Prevention Conference of February 1978, a new NPRM was issued on 12 February 1979 (44 FR 8984). Public hearings were then held in March in Washington, DC and San Francisco, CA; 265 comments were received on the docket, and were analyzed and the final rules were formulated. These rules appeared in the Federal Register of 19 November 1979.

STEERING GEAR DESIGN STANDARDS TO PROVIDE REDUNDANCY CGD 77-063

As part of the President's initiatives to reduce pollution, this regulation is needed to help reduce the possibility of a marine collision due to a loss of steering.

Continued on next page.....

KEYNOTES.....

An NPRM was published 16 May 1977 (42 FR 24869). As a result of the IMCO Tanker Safety and Pollution Prevention Conference of February 1978, a new NPRM was issued on 12 February 1979 (44 FR 8984). Public hearings were held on the docket and 138 comments have been received and analyzed and the final rules have been published.

CONSTRUCTION AND EQUIPMENT EXISTING SELF-PROPELLED VESSELS CARRYING BULK LIQUEFIED GASES
CGD 77-069

These regulations would amend the current ones to include the substantive requirements of the "Code for Existing Ships Carrying Liquefied Gases in Bulk," adopted by the Intergovernmental Maritime Consultative Organization (IMCO). The use of liquefied gas has increased, as have the problems associated with it. Due to its unique properties and the dangers associated with them, new regulations are being drafted. The environmental impact statement and regulatory analysis were completed in February 1979 and an NPRM on these regulations is anticipated in early 1980.

LICENSING OF PILOTS
CGD 77-084

This regulation takes into account the problems caused by increased ship size and unusual maneuvering characteristics. The proposal would require recency of service for each route upon which a pilot is authorized to serve, licensing with tonnage limitations commensurate with pilot experience, and consideration of ship-handling simulator training for pilots of very large vessels. A regulatory analysis and work plan were completed in October 1978. An NPRM is expected in April 1980.

REVISION OF 46 CFR 157.20-5 DIVISION INTO THREE WATCH REGULATION
CGD 78-037

This revision would require an adjustment in vessel manning requirements, to bring them in line with current legislation. It would change the requirements which identify personnel who must be used on the three watches and personnel who may be employed in a day working status. An NPRM formerly scheduled to be published on this docket in January 1980 will not be published, as the docket is being withdrawn.

TANK VESSEL OPERATIONS REGULATIONS, PUGET SOUND
CGD 78-041

This regulation governs the operation of tank vessels in the Puget Sound area. It was initiated to reduce the possibility of environmental harm resulting from oil spills in Puget Sound. This is to be accomplished by governing the operation of tankers and reducing the risk of collision or grounding.

Former Secretary of Transportation Brock Adams signed a 180-day Interim Rule on 14 March 1978 prohibiting entry of oil tankers in excess of 125,000 deadweight tons in Puget Sound; this appeared in the Federal Register of 23 March 1978 (43 FR 12257). An ANPRM was published 27 March 1978 (43 FR 12840). An extension of the interim rule was published in the Federal Register in order to allow the Coast Guard adequate time to complete this rulemaking.

The public hearings scheduled 11 and 12 June in Seattle, Washington, 13 June in Mt. Vernon, Washington, and 14 June in Port Angeles, Washington have been completed and all the comments received have been entered in the docket files for consideration. The extension of the interim navigation rule was published 21 June 1979 (44 FR 36174). This extension was effective 1 July and will be in effect until the Coast Guard prints notice of its cancellation. Copies of documents or the transcripts of the hearings may be obtained by writing to the Marine Safety Council. A final rule on the docket is currently expected in July 1980.

EIGHT-HOUR DAY VOLUNTARY OVERTIME
CGD 78-146

This docket is a review of the Eight Hour Day, Voluntary Overtime regulation in 46 CFR 157.20-10, which states that no licensed officer should be required to be on duty more than eight hours per day except in extraordinary circumstances. Existing regulations, however, do not address overtime or consider any possible "fatigue factor." Recent Coast Guard studies have shown that this factor has a profound effect on reaction time and judgement, therefore the regulation is currently being reviewed and is in the process of being withdrawn.

PERSONNEL JOB SAFETY REQUIREMENTS FOR FIXED INSTALLATIONS ON THE OUTER CONTINENTAL SHELF
CGD 79-077

This regulation is concerned with the health and safety requirements for installations engaged in oil field exploration and development. This action was mandated by pending Outer Continental Shelf legislation. It will provide more comprehensive protection for personnel employed in vessels and installations in the oil trade. The work plan received by the Marine Safety Council (MSC) in early July calls for an NPRM in March 1980.

SHIPBOARD NOISE ABATEMENT STANDARDS
CGD 79-134

These standards will establish acceptable sound levels for each of the various vessel compartments based on the latest technology. The standards will differentiate acceptable sound levels for both existing vessels and new vessels, acceptable methods of compliance, and will establish a hearing conservation program.

During the development of these standards, the U.S. Naval Ocean Systems Center (NOSC), San Diego, California was contracted by the Coast Guard to evaluate

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sound levels aboard several U.S. merchant vessels, to study the data obtained, and then to define the extent of the noise problem. Based on this data and other information available, they were asked to recommend a set of noise levels to be used in the control and/or elimination of the shipboard noise problem for the proposed standards.

This study has been completed. Copies are available through the National Technical Information Service (NTIS), Springfield, Virginia 22161; request NOSC technical documents numbers 243, 254, 257, 267 and 405.

PERSONNEL AND MANNING STANDARDS FOR FOREIGN VESSELS CGD 79-081

This regulation, deemed necessary to reduce the probability of oil spills, would establish minimum manning levels for foreign tank vessels operating in U.S. navigable waters. It would also establish procedures for the verification of training, qualification and watchkeeping standards. As we go to press, an NPRM is pending.

PERSONNEL SAFETY AND HEALTH REQUIREMENTS FOR INDUSTRIAL VESSELS CGD 80-15

Similar to 79-077, this regulation covers the vessels engaged in exploration, supply and support on the Outer Continental Shelf (OCS). Mandated by pending OCS legislation, this project covers the growing fleet of vessels which perform the variety of industrial functions involved in the exploration and development of offshore resources. The regulations, designed to provide a more comprehensive personnel protection, are scheduled for an advanced notice of proposed rulemaking (ANPRM) in October 1980.

A complete listing of all Coast Guard proposed regulations, both "significant" and "non-significant," appeared in the Thursday, February 22, 1980 Federal Register (45 FR 13312).

THE COAST GUARD HAS NO PUBLIC HEARINGS SCHEDULED AT THIS TIME FOR MARCH OR APRIL

WORLD MARITIME DAY

March 17 is World Maritime Day. This date was selected in 1978 by the International Maritime Consultative Organization (IMCO), the United Nations maritime agency. Coincidentally, this March 17 also marks the 64th anniversary of the first rescue of the newly formed United States Coast Guard. Members of the Cape Lookout, North Carolina station performed the historic rescue back in 1916.

"and after your half-hour break, the Captain wants to go waterskiing!"

THE CALHOON MEBA ENGINEERING SCHOOL

In 1966, an unprecedented labor-management venture gave life to a unique educational institution--the Calhoon MEBA Engineering School. Through the combined efforts of the Marine Engineers Beneficial Association, which is the oldest maritime union in the United States, and contracted steamship companies, the new school for marine engineers was officially opened that autumn. It was named in honor of Jesse M. Calhoon, president of the National Marine Engineers Beneficial Association (MEBA) since 1963. Mr. Calhoon envisoned a growing demand within the maritime industry for skilled, qualified marine engineers; in addition, he believed that continuing education would become essential as jobs and equipment increased in complexity. In order to meet the needs of the maritime industry during the Vietnamese "build-up," the school started with a two-year "crash program."

The Calhoon School occupies all 14 floors of what was previously an elegant downtown hotel, now renovated for school use. The top floors are reserved for student lodging and classrooms. The 14th floor, where a gym and recreation rooms are located, provides an excellent view of the busy, modern port of Baltimore. There is no charge for room, board or tuition, although students must purchase textbooks and other required classroom materials. Cadet engineers enrolled at the school receive a small monthly allowance to cover these and other necessities. Recently, the school has expanded to include another campus at Easton, on Maryland's historically renowned Eastern Shore.

Every two months a group of about 35 men and women begin the intensive three-year training program of the Calhoon School. The successful ones, well-trained professionals, will become marine engineers on freighters, tankers, bulk carriers and passenger ships world wide, plus numerous river, harbor and coastal vessels.

A marine engineer is essentially responsible for the life of his ship. He maintains and operates the engines, machinery and equipment aboard, including sophisticated electronic equipment. Therefore, an engineering officer must know more about shipboard systems than anyone else on the ship--propulsion engines, generators, boilers, refrigeration, air conditioning, sanitation systems, deck machinery, electrical systems, electronic equipment. No small feat! Understandably, development of the necessary technical skills requires a good deal of time, effort and intelligence. Each graduate of the Calhoon School's program has received more than 1,900 hours of class instruction and over 1,100 hours of practical skills training, in addition to a full year of sea duty.

Entry requirements for the Calhoon School are high and competition is stiff. Applicants must be between the ages of 17 and 31, have a high school diploma, and submit a transcript of their grades. Good grades in math and science studies are essential. Due to the strenuous work demanded of engineering officers, applicants must also be in good physical condition.

Although Calhoon School graduates do not receive a college degree, the school is approved by the Maryland Board of Higher Education and courses are conducted at college level. Should a graduate decide, later on, to acquire a degree in addition to his training and experience, some universities may grant partial credit for the courses studied at Calhoon. Recommendation for credits is made by the American Council on Education; acceptance depends on the individual institution and other factors, such as relevancy to the particular degree program chosen.

The total program at the school combines classroom and shipboard instruction, and includes travel to numerous foreign ports. It is divided into three phases conducted by six different departments.

The Electrical Department's courses range from fundamental concepts of electricity through advanced subjects, such as automated shipboard controls.

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ABOVE: A cadet engineer collects data from an electronics course experiment.
BELOW: Student engineers in the electricity course conduct lab experiments using training aids.

Student engineers in the applied electronics course operate the propulsion section of a ship's engine room console.

General Studies are comprised of specialized courses in lifeboat training to prepare students for the U.S. Coast Guard Lifeboatman's Examination; safety and firefighting, including training at the Firefighting School in Earle, New Jersey; ship construction and ship management; labor relations; license upgrading; and an innovative approach to first aid, tailored to meet typical shipboard emergencies (see "Heart Attacks at Sea: How Big A Problem?" in the February 1979 *Proceedings*).

The Industrial Arts Department teaches benchwork and welding and the use of machine tools, and stresses repair of marine machinery. All students must be qualified to take and pass the A.S.M.E. welding exam. Since not all parts or tools may be available in the event of a breakdown at sea, engineering officers must be able to make not only the necessary parts but, at times, the tools needed to make those parts.

The department of Marine Engineering covers both the theory and operation of ships' machinery and systems. Classroom and laboratory instruction focuses on the operation and maintenance of shipboard auxiliary equipment, marine steam generators and turbines, diesel and gas turbine engines, refrigeration, air conditioning and heating systems, hydraulics and pneumatic power equipment, marine control systems, and modern marine power systems.

The Mathematics and Science Department offers a review of advanced high school mathematics and sciences and progresses to topics such as thermodynamics, marine chemistry, engineering materials and blueprint reading.

The Physical Education Department has complete gym facilities. Participation is encouraged in popular competitive sports.

Entry-level cadets must pass through three phases of training at the Calhoon School. During their first six months (**Phase I**) the students gain practical skills and basic knowledge in preparation for sea training. They alternate between the Baltimore and Easton campuses while undergoing intensive familiarization with every shipboard duty expected of a marine engineer. During Phase I the cadets are introduced to machine shop, welding and benchwork, and are taught firefighting and lifeboat handling. Additionally, basic courses in auxiliary equipment, main propulsion machinery and electricity are taught. All of the subjects taught during Phase I prepare the cadet engineers to be contributing members of a ship's crew during Phase II.

The cadet engineer must complete a machine shop course which consists of 304 hours of welding, operating a lathe, shaper, drill press and milling machine and other equipment found in the machine shop of a modern ship.

Phase II provides cadets with a full year of sea-going engineroom experience on at least three different vessels. While at sea, cadets must also complete correspondence courses covering main propulsion, auxiliary machinery, electricity, safety and firefighting, and mathematics.

Finally, students return to shore for **Phase III**, the longest and perhaps the most demanding part of the school's program. For 18 months, they attend advanced classes in ship construction, hydraulics, pneumatics, advanced propulsion systems, and many other difficult topics. A marine engineer must be much more than a mechanic--these cadets will soon be ships' officers with many men working for them. Therefore, in preparation for such responsibility, Phase III includes courses in ship's management and business, labor relations, and first aid.

In addition to the Calhoon School's entry-level program, the school is involved in the important business of continuing education. Advanced training is available for licensed marine engineers who must keep up with the latest developments in their field and the new equipment being installed on ships. Some classes, particularly the basic LNG course, are also attended by deck officers and radio officers. Each year, hundreds of MEBA members take advantage of the school's advanced training programs. Courses offered vary according to need, but usually include an electrical course, welding, applied electronics, LNG fundamentals, refrigeration and air conditioning, and diesel theory and operation. An upgrading course is also available to assist members in preparing for Coast Guard licensing examinations.

Obviously, the Calhoon MEBA Engineering School is no snap. As the school catalog points out, nothing worthwhile ever is. Success is not guaranteed upon graduation--that's when the work really begins! Calhoon School graduates are not placed, but must procure their jobs through local union hiring halls. Although there is no tuition at the school, students do incur an obligation to MEBA for their education. To meet this training obligation, they must work at least 200 days per year for three consecutive years as a marine engineer aboard an MEBA-contracted vessel. Nonetheless, it looks like all the hard work, time and study must be worth it in the long run. After completing their obligation requirements, an incredible 95 percent of Calhoon graduates of the

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three-year program, which began on August 13, 1970, remain in the field of marine engineering. The marine engineer's role in operating the merchant fleets of our nation is, apparently, a rewarding and fulfilling life.

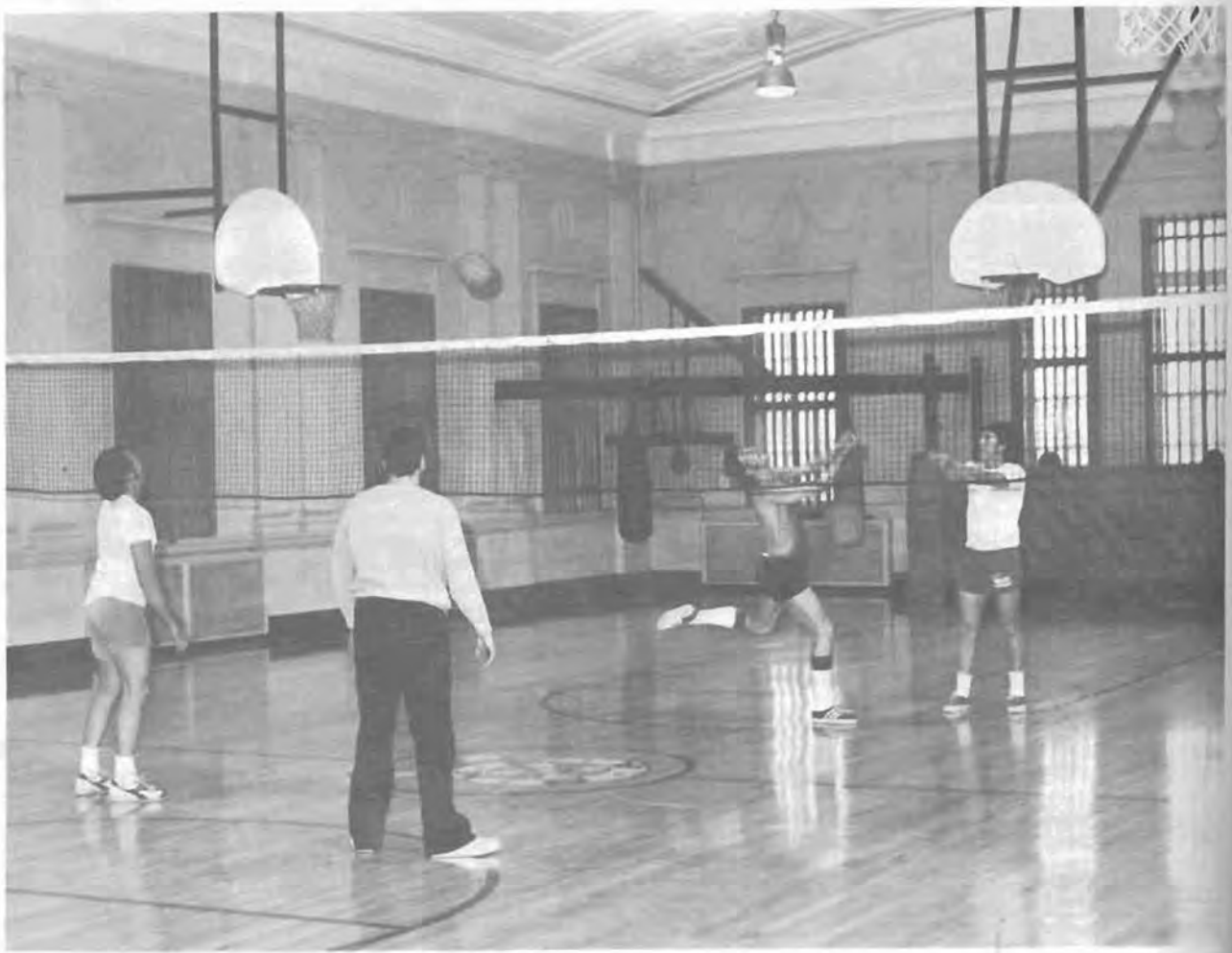
For further information about the Calhoon School, contact:

Calhoon MEBA Engineering School
9 Light Street
Baltimore, Maryland 21202
(301) 727-5350

This is the second in a series of articles on marine-related schools and organizations. The purpose of these articles is to familiarize readers with existing institutions, explaining exactly what they are and what they do, and who is eligible to join/attend.

If you would like to submit information on a particular school or organization, please write to: Commandant (G-CMC/24), U.S. Coast Guard Headquarters, Washington, DC 20593 or call (202) 426-1477.

Recreational activities of all types are conducted in the spacious gymnasium of the school.



Lessons from Casualties

Recently, a gasoline tank aboard a fishing vessel exploded, injuring three men. The vessel, a 240-foot tuna boat, was in a southern U.S. shipyard where it had been undergoing repairs for many weeks prior to the casualty. The vessel has three freestanding gasoline tanks (7' x 5' x 4') located on the starboard side of the after wet deck (a semi-enclosed area between the main deck and the tops of the fish wells). The tanks stand about 4 inches off the tops of the fishwells and are about one foot inboard of the vessel's starboard shellplate. They are solidly constructed of 3/8-inch steel plate with no accesses or inspection plates and are connected by a common suction line and common vent.

The explosion occurred while hot work was being done in the vicinity of No. 1 and No. 2 gas tanks. A pipefitter, standing between the two tanks, was welding a new water discharge line to the vessel's shellplate when No. 1 gas tank exploded. He was welding about 3 feet above the deck, 2 feet aft and 1 foot outboard of No. 1 tank. No hot work was being done on the tank itself or on its lines or vents.

The vessel had entered the shipyard nine weeks earlier. Upon arrival, the gasoline tanks had been drained. The tanks, with their lines and vents, were flushed with water, blown dry with air, and then completely filled with water. A marine chemist's certificate was then issued stating that it was safe to remove the vessel's shellplate immediately outboard of the gas tanks. No hot work was authorized on the tanks, their lines or vents. The shell plate removal was completed three or four days later. No subsequent marine chemist certificate was issued for the gas tanks or the wet deck area.

Two months later, upon completion of major repair work, the vessel sailed for a single day of sea trials. During the sea trials, the water was drained from the gas tanks by crew personnel. Three days later, the explosion occurred in the empty No. 1 tank.

The force of the explosion blew the top off the tank and wedged it against the overhead. The common vent and suction lines which ran above the tanks were ruptured and pinned to the overhead by the tank top. The sides of the tank were bowed but intact. There was no indication of fire following the explosion. Immediately after the explosion, the atmosphere in No. 1 tank was measured by a marine chemist. At the top of the tank, gasoline vapors were present in concentrations within the explosive range. At the bottom of the tank, gasoline vapor concentrations exceeded the upper explosive limit. The tank itself was empty, but there was a layer of sediment evenly covering the tank bottom.

The atmospheres within the empty No. 2 and No. 3 gas tanks were also measured to be within the explosive range. In fact, a reading of 25 percent of the lower explosive limit was obtained from within a newly installed fourth gas tank, which had never contained gasoline but was connected to the other three tanks by a common suction line!

This explosion provided a vivid demonstration that even though the sediment in No. 1 gas tank had been under water for many weeks, it still retained enough gasoline to generate explosive vapors once the water was removed. These vapors probably leaked through the drain valve of No. 1 tank and traveled the short distance to the source of ignition--the welding arc at the shellplate. The pipefitters, who had been burning and welding around the gasoline tanks for weeks, were unaware that the tanks had been recently emptied during sea trials. Evidently the welding of the water discharge line was a late addition to the work list, and the shipyard's safety department was unaware that any more hot work was needed in the vessel's wet deck area.

Improved communications between the shipyard's production and safety staffs and stricter in-yard controls of hot work procedures may have prevented this accident.

ABOVE: Chuck Warren rescues "victim" Sherry Claytor. RIGHT: After administering mouth-to-mouth resuscitation, Warren signals for instructors Hill and Seward to tow him and Claytor toward the boat, while he begins cardiopulmonary resuscitation. The entire recovery took less than one minute.

THE PETALUMA EXPERIENCE

By Dale L. Puckett
Audiovisual Branch
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Coast Guard Aviation Structual Mechanic Chuck Warren flexed his knees as the 44-foot motor lifeboat took another roll. Fifty-six degree Pacific ocean water rushed over the gunnel.

Fifty yards from the lifeboat Sherry Claytor, a volunteer victim and wife of a Coast Guard yeoman, waited. Several times a minute she disappeared behind seven-foot swells.

Coast Guard Physician's Assistant Casey Hill pushed the button on his stop watch.

"Go," he yelled.

Warren jumped into the water and swam toward Claytor. She was now floating face down in the water.

When Warren reached the "victim," he quickly flipped her over. Keeping her afloat with one hand and pinching her nostrils closed with the other, he gave her four quick breaths of mouth-to-mouth resuscitation. Seconds later, Warren had positioned himself behind Claytor. His left arm held her on the surface of the water, his right went into the air.

With this signal, Aviation Machinist's Mate Les Seward began pulling the line attached to Warren's swimmer's harness. As he was being towed toward the boat, Warren wrapped both arms around Claytor from behind, grabbed his doubled left fist with his right hand, and began compressing her chest 80 times per minute. He was demonstrating in-water cardio-pulmonary resuscitation (CPR).

"Five yards," Seward yelled as Warren and his patient approached the boat.

Warren moved to Claytor's side and gave her two more ventilations. Then, he held her in position while Seward pulled and a second later Claytor was in the boat.

"Fifty-six seconds," Hill shouted over the sound of the surf and the boat's engines. "We're getting better."

It was Thursday afternoon of the second week of the Coast Guard's Emergency Medical Technician (EMT) School and 33 students watched. In less than an hour they would be wearing wet suits and getting first hand experience with these new water rescue techniques in the calmer water near the Bodega Bay, California Coast Guard station. They would master in-water patient evaluation and management and learn how to remove an injured victim from the water in a stoke's litter.

Continued on next page.....

PETALUMA.....

The Coast Guard's reason for establishing the new EMT school at its Petaluma, California training center is based on the assumption that a few minutes could make a lifetime of difference.

For years, the service has had the reputation of rescuing people and property at sea. But in the past, except at large stations where hospital corpsmen were available, most medical care had to wait until after the patient was delivered to a shore-based hospital.

The Coast Guard was no different than most landlocked ambulance services on the nation's highways which, up until six or seven years ago, simply cut an accident victim from the vehicle and delivered him to a hospital for treatment. Even the prestigious American Medical Association only recently recognized emergency medicine as a speciality field.

Now, the Coast Guard has defined an Emergency Medical System (EMS). It includes trained emergency medical technicians and hospital corpsmen, emergency medical gear and medical formats for radio communications as well as Search and Rescue (SAR) vessels and aircraft.

"The trained EMT is the most important part of the system," said Hospital Corpsman Ken Beck, another instructor. "Without him, the patient would not live long enough to get into the rest of the Emergency Medical System."

To beef up the important personnel component of its emergency medical system, Coast Guard Commandant Admiral J. B. Hayes has set a goal of having at least one EMT crewmember on every SAR mission. To accomplish this goal he must have over 1,400 EMT's stationed at the service's 318 SAR units.

These figures translate to five EMT-trained SAR aircrewmen per air station and five EMT crewmen per lifeboat station, plus two EMT cuttermen on each Coast Guard cutter.

To the seven instructors here, it means giving hands-on training to more than 400 students each year. To the 33 students in each class, it means 17 consecutive, 14-hour days of study and hard work. To the commercial mariner and recreational boater, it means the best possible emergency medical assistance is available when needed.

Students who successfully complete the intensive training are rewarded with Department of Transportation certification as a basic EMT, the same certification in 23 states, a special Coast Guard qualification code and the knowledge that they are truly qualified to save the life of a fellow human being. Says instructor Curt Mauck, "Saving a life is addictive."

Instructor Curt Mauck helps test new in-water resuscitation techniques on a "Resusci-Anne" mannequin.

PETALUMA.....

The Petaluma school itself is unique for several reasons. It is the largest EMT school nationwide and the only servicewide EMT school among the uniformed services. More importantly, however, its curriculum is specifically oriented toward Coast Guard SAR operations.

While most civilian EMT courses teach ambulance-based personnel working at the scene of highway accidents or in-home emergencies, this course is aimed at the specifics of emergency care aboard Coast Guard aircraft and vessels.

Topics taught here which go untouched at most civilian EMT schools include hypothermia, cold-water survival, near-drowning and diving accidents, as well as the extrication and management of victims of aircraft and vessel accidents.

To the uninitiated, the training is so intense that it leaves a queasy stomach.

For example, the class which witnessed Thursday's in-water CPR demonstration barely had time to recover from the cold water of Bodega Bay before being thrown into the fire of a simulated mass disaster.

When they returned from lunch on Friday, instructors Les Seward and Larry Young grabbed 11 students and hustled them into an unused classroom with the shades drawn. While the others were reviewing the rules for the exercise, Seward and Young used plastic makeup called "moulage" and fake blood to turn the parking lot next to the school into a ghastly scene of blood and gore.

Technically the scenario was simple. A plane had crashed into a parking lot. The pilot, obviously dead, had a major throat laceration. The co-pilot had a lacerated forehead and a protruding eye.

Other victims had chest injuries, eviscerations, hearts attacks and burns. There was even a pregnant woman delivering prematurely. Fake blood gushed from gashes called "pumpers" or arterial wounds, staining the concrete to a tomato red.

The instructors called the exercise a "triage," a system of sorting and allocation of treatment of patients in a battle or disaster according to specific priorities. They carried clipboards and closely noted each student's technique.

Curt Mauck helps test new in-water resuscitation technique on fellow-instructor Chuck Warren.

Another instructor, Radioman Jerry Newcomer, was intent on creating additional chaos as he manned a 2½-inch fire hose connected to a bright yellow fire truck. Red and blue lights flashed. The sound of a siren pierced the ear. Over 150 gallons of water per minute poured onto the plane, the parking lot and anything or anybody in the way.

Behind Newcomer a casualty was pinned beneath the plane's propeller. He was moaning loudly when a student ran to his side.

"I'm Beverly Harris from the Coast Guard. I'm an emergency medical technician and I'm here to help. Can you tell me what's wrong," she said.

While she was talking, she quickly surveyed the patient's condition.

"I can't move! My chest! I can't stand it!" he said between moans.

"Try to relax and don't try to move. I'm going to put a dressing on your chest," she said.

A minute later she had finished the bandaging and moved on to another victim. Fifteen minutes later, Ken Beck blew the whistle. The nightmare was over. Harris had treated five more victims.

The responsibility placed on the shoulders of the 18- to 23-year-old SAR crewmen is awesome, but the pressure is creating additional benefits.

"It really hits them on graduation day," Newcomer said. "They have earned the qualification code.

Continued on next page.....

ABOVE: Instructor Jerry Newcomer evaluates student performance on data tape recorded by a "Resusci-Anne" mannequin during CPR training. BELOW LEFT: Newcomer reads a CPR data tape. BELOW RIGHT: Student Becky Schultz practices with an oxygen-powered resuscitator.

When they go back to the station the rest of the crew will come to them with real questions. They will expect real answers. During a rescue they will be the only person qualified to supply the vital information doctors will need for successful treatment."

Often, lifestyles are changed by the intensity of the Petaluma experience.

"Since we cram a one-semester course into two and a half weeks, we put the students into a pressure situation they haven't experienced since boot camp," Warren said. "We show them they can handle a situation they might have been unsure of before.

"The success carries over into tasks that are not associated with emergency medicine. It makes them fight for a product or a project they believe in. It really makes you feel great to see that we have supplied positive motivation to life in general," he said.

The short time frame also aids retention.

"It makes things clearer in the student's mind," Newcomer said. "They don't have time to sit back and analyze what we are saying so they must take it as gospel. Because of this, they remember what we teach and not what they thought we were teaching."

One of the school's major benefits for the boating public is the development of a standardized format for the transmission of medical information. Newcomer headed that project.

"We worked with the radioman school here and designed a format that is compatible with both the needs of the radioman and the doctor who will use the information," he said. "We teach the format to every EMT so that in the future doctors will get exactly the same information from the Coast Guard in exactly the same order, no matter where they are located. This will aid diagnosis tremendously."

Other benefits to boaters are resulting from the basic medical research conducted by the instructors here. For example, Commander Alan Steinman, Chief of the Operational Medicine Branch at Coast Guard Headquarters and father of the service's EMT program, recently joined with several prominent doctors to gather data designed to document the effectiveness of in-water CPR.

Using a printed readout from an electronic monitor hooked up to an aquatic mannequin, researcher Nico March evaluates the effectiveness of the new in-water CPR technique.

Dr. Martin J. Nemiroff, an assistant professor in the Department of Internal Medicine at the University of Michigan who has successfully revived 17 "near-drowning" victims, and Nico F. March, a University of California at San Diego researcher who built a $30,000 immersible mannequin to measure the sternal deflection rate and other physiological data, joined Dr. Steinman to gather facts needed by the National Research Foundation and the American Heart Association. This research must be done before new techniques can be endorsed and taught to the general public.

Continued on next page.....

Students react at a realistic mass disaster scene staged at the Coast Guard EMT School at Petaluma, California.

PETALUMA.....

"The new aquatic emergency rescue techniques being pioneered here will allow rapid response by trained personnel that will often make the difference between successful rescue and first-aid or certain death," March said.

While the training here continues, Dr. Steinman works to supply every Coast Guard search and rescue unit with a basic EMT kit that measures up to the state of the art. It includes oxygen powered resuscitation and suction equipment, splints, dressings, bandages, a stethoscope and other emergency gear.

The Petaluma school was one year old January 23. Already, it is paying for itself in lives saved. Dozens of recently documented rescue cases, on both coasts, credit EMT's with saving the lives of boating accident victims.

Whether teaching new water rescue techniques in the cold water of the Pacific, or forcing students to face the blood and gore of a simulated mass disaster, the goal of Dr. Steinman and the Emergency Medical Technician School staff is simply stated: "To provide adequate emergency medical care on every Coast Guard mission requiring patient or survivor rescue and transport."

It is an accomplishment which will instill new meaning to the service's recruiting slogan, "The Lifesavers."

This article was summarized in the Coast Guard Commandant's Bulletin *of December 24, 1979 and was also featured in its entirety in the* Navy Times *on January 28, 1980.*

Moulage (plastic makeup) and fake blood turn simulated disasters into realistic, ghastly scenes.

About the Author

Dale L. Puckett

PAC Dale Puckett holds a Bachelor of Science degree in Radio-TV Film from the University of Kansas and a Master's degree in Management from Webster College in St. Louis. He recently completed the U.S. Navy's Applied Photojournalism program at Syracuse University and is a contributing editor for '68 MICRO JOURNAL, a computer trade publication. He has 12 years of active service with the U.S. Coast Guard and is presently assigned to the U.S.C.G. Photo Team of the Audio-visual Branch at Coast Guard Headquarters.

Nautical Queries

The following items are examples of questions included in the Third Assistant Engineer through Chief Engineer examinations and the Third Mate through Master examinations.

DECK

(1) The magnetic compass magnets are constrained to remain essentially horizontal, and they are acted on only by the

A. horizontal component of the earth's total magnetic force.
B. magnetic poles.
C. ship's magnetism.
D. prime vertical meridian.

REFERENCE: Dutton, 13th Ed.

(2) A gyrocompass is a very reliable instrument, but its accuracy decreases above latitude

A. 60 degrees.
B. 75 degrees.
C. 80 degrees.
D. 85 degrees.

REFERENCE: Dutton, 13th Ed.

(3) The breaking test load of wire rope used with cargo gear having a lifting capacity of 20 tons shall be at least

A. 3 times the safe working load.
B. 4 times the safe working load.
C. 5 times the safe working load.
D. 6 times the safe working load.

REFERENCE: 46 CFR 31.37-35

(4) Damage to cargo caused by fumes or vapors from liquids, gases, or solids is known as

A. vaporization.
B. tainting.
C. oxydation.
D. contamination.

REFERENCE: Saubier

(5) When the dew point of the outside air is lower than or equal to the dew point of the air in the cargo hold you should

A. secure all ventilation.
B. shut down the intake blowers.
C. ventilate the cargo holds.
D. shut down the exhaust blowers.

REFERENCE: Saubier

ENGINEER

(1) As the rate of combustion is increased in a boiler, more steam can be generated because the

A. fires are hotter.
B. weight rate of hot gas flow increases.
C. furnace becomes hotter.
D. temperature difference between the hot gas and the boiler water increases.

REFERENCE: Latham

(2) According to Coast Guard regulations, blowoff piping external to a boiler with a maximum allowable working pressure of 1200 psig will be capable of withstanding a minimum of

A. 1200 psig.
B. 1425 psig.
C. 1500 psig.
D. 1575 psig.

REFERENCE: 46 CFR 56.50-40(b)

(3) What type of heat is removed from the refrigerant in the condenser of an R-12 plant?

A. latent heat of vaporization.
B. heat of compression.
C. superheat.
D. all of the above.

REFERENCE: Principles of Naval Engineering

(4) An accidental path of low resistance which passes an abnormal amount of current is known as a (an)

A. open circuit.
B. short circuit.
C. polarized ground.
D. ground reference point.

REFERENCE: Basic Electricity NAVPERS

(5) In an electrohydraulic steering gear, any change in relative motion between the synchronous receiver and the followup gear results in

A. the pumps going to full stroke.
B. closing of the six way valve.
C. driving the rams up against the stops.
D. a change in pump stroke.

REFERENCE: Naval Aux Machy

ANSWERS

Deck
1. A; 2. B; 3. B; 4. B; 5. C

Engineer
1. B; 2. B; 3. D; 4. B; 5. D

Please note that Deck Question No. 2 of the December 1979 Nautical Queries contained a typographical error. The correct answer to that question is B, not D as indicated. The purpose of a flame safety lamp is to determine the presence of sufficient oxygen to sustain life.

MERCHANT MARINE SAFETY PUBLICATIONS

The following publications may be obtained from the nearest marine safety office, marine inspection office or by writing: **Commandant (G-CMA/TP26), U.S. Coast Guard, Washington, DC 20593.** Because changes to the rules and regulations are made from time to time, these publications can be kept current between revisions only by referring to the Federal Register. (Official changes to all Coast Guard authored federal regulations are published as final rules in the Federal Register on Mondays or Thursdays.) Following the title of each publication in the table below are the dates of the most recent editions and changes, if any.

The Federal Register may be obtained by subscription ($5 per month or $50 per year) or by individual copy (75 cents each) from SupDocs, U.S. Government Printing Office, Washington, DC 20402.

CG No.	TITLE OF PUBLICATION
CG-101-1	Specimen Examinations for Merchant Marine Deck Officers (2nd and 3rd Mate) (4-1-77).
CG-101-2	Specimen Examinations for Merchant Marine Deck Officers (Master and Chief Mate) (7-1-78).
CG-108	Rules and Regulations for Military Explosives and Hazardous Munitions (4-1-72). FR 7-21-72, 12-1-72, 8-18-75.
CG-115	Marine Engineering Regulations (8-1-77). FR 9-26-77, 10-10-78, 11-16-78, 12-4-78, 3-12-79, 5-3-79.
CG-123	Rules and Regulations for Tank Vessels (8-1-77). Ch-1, 4-78. FR 8-18-77, 9-12-77, 9-26-77, 1-11-79, 3-12-79, 5-3-79, 6-14-79, 7-2-79, 11-19-79, 1-31-80.
CG-169	Navigation Rules - International - Inland (5-1-77). FR 7-11-77, 7-14-77, 9-26-77, 10-12-77, 11-3-77, 12-6-77, 12-15-77, 3-16-78.
CG-169-1	Colregs Demarcation Lines (7-15-77).
CG-172	Rules of the Road - Great Lakes (7-1-72). FR 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, 1-13-77, 11-3-77, 12-6-77.
CG-174	Manual for the Safe Handling of Flammable and Combustible Liquids and Other Hazardous Products (9-1-76).
CG-175	Manual for Lifeboatmen, Able Seamen, and Qualified Members of Engine Department (3-1-73).
** CG-176	Load Line Regulations (2-1-71). FR 10-1-71, 5-10-73, 7-10-74, 10-14-75, 12-8-75, 1-8-76.
CG-177	Yacht Admeasurement and Documentation (9-72).
CG-182-1	Specimen Examinations for Merchant Marine Engineers License (2nd and 3rd Assistant) (4-75).
CG-182-2	Specimen Examinations for Merchant Marine Engineer Licenses; First Assistant Engineer, Steam and Motor, any Horsepower (4-76).
CG-182-3	Specimen Examinations for Merchant Marine Engineer Licenses; Chief Engineer Steam and Motor, any Horsepower (4-76).
CG-184	Rules of the Road--Western Rivers (8-1-72). FR 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, 7-11-77, 12-6-77, 12-15-77.
* CG-190	Equipment Lists (8-1-77).
CG-191	Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel (11-1-76). FR 3-3-77, 8-8-77, 4-9-79, 12-6-79.
CG-227	Laws Governing Marine Inspection (7-1-75).
**** CG-239	Security of Vessels and Waterfront Facilities (5-1-74). FR 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, 9-27-76, 2-3-77, 3-31-77, 7-14-77, 7-28-77, 9-22-77, 9-26-77, 12-19-77, 1-6-78, 1-16-78, 3-2-78, 11-16-78, 1-23-79, 1-25-79, 2-12-79, 11-5-79, 12-10-79, 1-31-80.
CG-242	International Conventions & Conferences on Marine Safety (6-51).
* CG-257	Rules and Regulations for Cargo and Miscellaneous Vessels (9-1-77). Ch-1, 3-17-78. FR 9-26-77, 10-10-78, 1-11-79, 3-12-79, 5-3-79, 6-14-79, 7-2-79.
CG-258	Rules and Regulations for Uninspected Vessels (4-77). Ch-1, 3-17-78. FR 6-14-79, 7-2-79, 12-17-79.
CG-259	Electrical Engineering Regulations (7-1-77). FR 9-26-77, 10-10-78, 11-16-78, 12-4-78.
CG-268	Rules and Regulations for Manning of Vessels (7-1-77). FR 11-19-79.
CG-293	Miscellaneous Electrical Equipment List (6-73).
CG-323	Rules and Regulations for Small Passenger Vessels (7-1-77). Ch-1 3-17-78. FR 10-25-77, 7-17-78, 3-12-79, 6-14-79, 7-2-79, 12-13-79.
CG-329	Fire Fighting Manual for Tank Vessels (1-1-74).
CG-388	Chemical Data Guide for Bulk Shipment by Water (1976).
CG-403	Great Lakes Pilotage Regulations (7-76).
CG-439	Bridge to Bridge Radiotelephone Communications (12-1-72). FR 12-28-72, 3-8-74, 5-5-75, 7-11-77.
CG-467	Specimen Examinations for Uninspected Towing Vessel Operators (10-1-74).
CG-474	When You Enter That Cargo Tank (3-76).
CG-478	Liquefied Natural Gas, Views and Practices, Policy and Safety (2-76).
CG-480	Oil Pollution Control for Tankermen (6-75).
CG-482	Benzene Safe Handling Practices (12-76).
CG-486	Shippers Guide to Hazardous Materials Regulations (Water Mode) (8-77).
CG-491	Safety for Small Passenger Vessels (8-77).
OLD CG-497, Rules and Regulations for Recreational Boating (12-78), now M 16752.2 (12-78) FR 7-19-79.	
*** CG-515	Rules and Regulations for Foreign Vessels Operating in the Navigable Waters of the U.S. (2-78). FR 1976--7-8, 8-26, 9-16, 9-20, 12-13. 1977--1-3, 3-31, 5-19, 6-16, 7-7, 7-14, 7-21, 7-25, 8-4, 8-11, 9-8, 9-12, 9-22, 9-26, 9-29, 11-10, 12-8, 12-15, 12-19. 1978--4-6, 5-18, 5-22, 6-29, 7-24, 9-25, 11-16, 11-20, 11-30, 12-7, 12-28. 1979--1-22, 1-25, 2-5, 2-12, 2-26, 3-29, 4-12, 4-16, 5-3, 5-7, 5-31, 6-14, 8-2, 8-16, 8-27, 9-4, 9-24, 10-15, 10-18, 11-1, 11-5, 11-19, 12-3, 12-10, 12-27. 1980--1-10, 1-31.
CG-518	Marine Investigating Officer's Regulations Handbook (2-78). FR 2-16-78, 4-27-78, 5-25-78, 6-15-78, 9-25-78, 10-19-78, 11-20-78, 1-25-79, 7-19-79, 9-4-79, 1-10-80.
CG-526	Utilizing the Packaged Hazardous Materials Regulations, 49 CFR (5-78).
Safety of Life at Sea: Convention, with Regulations, London, June 17, 1960.	
Specifications for Merchant Vessel Equipment (Subparts of Chapter Q, 46 CFR, parts 160 to 164.	

*Temporarily out of stock
**Under revision--CG-176 text can be found in Title 46 CFR Parts 41-69
***Available only through the Superintendent of Documents
****Cancelled

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