# Proceedings
of the Marine Safety Council

Vol. 37, No. 7

August - November 1980

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

CG-129

# Proceedings
of the Marine Safety Council

Published monthly by the Commandant, USCG, in the interest of safety at sea under the auspices of the Marine Safety Council. Special permission for republication, either in whole or in part, with the exception of copyrighted articles or artwork, is not required provided credit is given to the Proceedings of the Marine Safety Council. All inquiries and requests for subscriptions should be addressed to Commandant (G-CMC/24), U.S. Coast Guard, Washington, DC 20593. Please include mailing label when sending in a change of address. The Office of the Secretary of Transportation has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this agency. Use of funds for printing this publication has been approved by the Director of the Office of Management and Budget through May 31, 1984.



DIST. (SDL No. 112)
A: aede(2); fghklmntuv(1)
B: n(50); e(16); c(5); f(4); gj(3); r(2); bki q(1)
C: eglmp(1)
D: adgklm(1)
E: mn(1)
F: abedehjkloqst(1)
List TCG-06

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

# Contents

## feature



## departments



## cover

*Captain Harold C. Carlton and CWO Chuck Brinson inspect equipment aboard the LNG carrier SS GOLAR FREEZE before allowing the ship to enter the Port of Savannah. For more on the Coast Guard's role in ensuring the safe offloading of LNG at Savannah's Elba Island facility, see the story beginning on page 144.*

A letter from the (new) editor

As noted in the last issue (June/July 1980), the resignation of Editor Babs B. Eason forced a temporary halt in publication of the Proceedings. My appointment as new editor became effective September 22, 1980, and we are pleased to be able to resume publication with the present issue. You will notice a few changes in the appearance of the Proceedings as well as a new department: Chemical of the Month. "Anhydrous Ammonia" is the first in a series of sketches of bulk chemicals shipped by sea to be prepared by members of our Cargo and Hazardous Materials Division.

Although I have been on the job only a few weeks, I have already been impressed by the respect accorded the Coast Guard's work. I am proud to be a part of it and will do my best to serve you well. Thank you for your continuing interest during our lapse in publication and please do not hesitate to send me your comments and suggestions. Any input would be most appreciated.

Julie Steinkler

# New Executive Secretary Reports for Duty at Marine Safety Council

Commander Alfred D. Utara became the new Executive Secretary of the Marine Safety Council in July 1980. He replaces Captain Philip J. Danahy, who retired June 1 after 26 years of service with the Coast Guard.

In addition to heading the staff of the Marine Safety Council, the Executive Secretary serves as Regulations Officer for the Coast Guard. As such, he is responsible for seeing that the Coast Guard comply with all requirements of the legislative and executive branches of the government when issuing regulations.

Commander Utara is a 1961 graduate of the U.S. Coast Guard Academy in New London, Connecticut. He has been actively involved in marine safety since 1963, when he was assigned to the Marine Inspection Office in New York as an inspector/investigator. Following a stint as Executive Officer of the Marine Inspection Office in Miami, he served in the Merchant Vessel Inspection Division at Coast Guard Headquarters in Washington, D.C., after which he assumed the post of Deputy Chief, Marine Investigation, with the National Transportation Safety Board. Prior to his appointment as Executive Secretary, he served as Commanding Officer of the Marine Safety Office in Honolulu.

Commander Utara and his family live in Bowie, Maryland. Mrs. Utara, the former June Johannsen, is a native of Astoria, New York. She and the Commander are the parents of three sons, David, Mark, and Christian, and one daughter, Dawn Marie. Christian, "the only one who doesn't get seasick," is presently concentrating on his schoolwork at Belair Junior High but has his eye on a future career with the Coast Guard. ⚓

# Maritime Sidelights

### New Head Appointed to U.S. Merchant Marine Academy

Thomas A. King has been selected to succeed Howard F. Casey as superintendent of the U.S. Merchant Marine Academy in Kings Point, New York. Mr. King is a 1942 graduate of the Academy. Following service in the merchant marine during World War II, he earned his master's license in 1945 and became one of the youngest officers to command a merchant ship.

Prior to his appointment, Mr. King served as eastern regional director of the Maritime Administration, an agency of the Department of Commerce he joined in 1949. Since the superintendent of the Academy is traditionally an officer, Mr. King was commissioned a rear admiral in the U.S. Maritime Service at the time of his appointment on July 13, 1980. He was commissioned a captain in the U.S. Naval Reserve on September 23, 1980.

### Regulatory Guide for the Review and Inspection of the New Tank Vessel Standards

On April 1, 1980 the Coast Guard issued a "Draft Regulatory Guide for the Review and Inspection of the New Tank Vessel Standards." The purpose of this guide is to facilitate implementation and interpretation of the tank vessel regulations that were issued on 19 November 1979 regarding segregated ballast tanks (SBT), dedicated clean ballast tanks (CBT), crude oil washing systems (COW), inert gas systems (IGS), and improved steering gear standards.

The Coast Guard's original goal was to incorporate the appropriate tanker industry comments and the interpretations agreed to by IMCO at MEPC XIII (9 - 13 June 1980) in an updated version of the regulatory guide for distribution in October 1980. Many interpretations were considered at MEPC XIII, but final action on a majority of them was deferred until MEPC XIV (10 - 14 November 1980).

To provide a more complete document, distribution of the updated version of the regulatory guide will be delayed until January 1981 so that the interpretations agreed to at MEPC XIV can be included.

### "Lunar Lander" Used to Probe Deep-Sea Floor

Oceanographers from the University of Rhode Island, the University of Washington, and Oregon State University joined the Scripps Institution of Oceanography in August to test an unmanned probe of the deep-sea floor off the California coast. The probe, called the Bottom Lander, was designed by Scripps to study the formation of manganese nodules on the ocean floor. These nodules contain metals that may be profitable to mine. The Lander makes it possible to isolate small sections of the sea floor for experiments on the circulation of various metals important to nodule formation. The role played by living and nonliving substances can also be determined.

After extensive testing, titanium and space-age plastics were chosen for the construction of the probe, which is designed to work for periods of several weeks to one year at depths of over two miles and at pressures one hundred times greater than sea-level atmospheric pressure. Plans for the Lander call for it to begin its duties on the ocean floor next year at five different deep-sea locations in the eastern Central Pacific.

### Maritime Education Reform Bill Becomes Law

The Maritime Education and Training Act, passed by the House on June 30 and the Senate on September 30, was signed into law by the President on October 15, 1980.

This legislation, the result of four years of effort by a House subcommittee headed first by Rep. Gerry E. Studds, D-Mass. and later by Rep. Les AuCoin, D-Ore., establishes for the first time a service obligation for students graduating from the maritime academies. Graduates of the U.S. Merchant Marine Academy in Kings Point, New York, who receive full scholarships from the government, will in the future have to serve five years either as an officer in the U.S. Merchant Marine, as a commissioned officer in one of the armed forces of the United States, in the National Oceanic and Atmospheric Administration, or, in the event sea-going jobs are not available, in related maritime employment as defined by the Secretary of Commerce. A service obligation of three years is established for federally assisted graduates of the six state maritime academies.

The new law also curbs abuses in the system of nominating and appointing candidates to the U.S. Merchant Marine Academy. Gentlemen's agreements and sweetheart deals between members of Congress are being eliminated, admissions standards have been tightened, and preferential treatment for children of U.S. Merchant Marine Academy alumni is being ended.

### Towing Safety Advisory Committee to be under Jurisdiction of Coast Guard

The Secretary of Transportation has delegated authority over the Towing Safety Advisory Committee established by Congress in January 1980 to the Commandant of the Coast Guard. The committee, which shall serve as a consultative body on shallow-draft inland and coastal waterway navigation and towing safety, shall consist of 16 members to be chosen from the barge and towing industry, the offshore mineral and oil supply vessel industry, port districts, authorities, or the terminal operators industry, maritime labor, the shipping industry, and the general public. A request for applications will be published in the Federal Register in early November.

The following were published between June 6, 1980, when the last issue of the Proceedings appeared, and October 20, 1980:

**Final rules:** CGD 80-021A Equipment Requirements for Boat Operators; Acceptance of Hand Red Flares as Visual Distress Signals, July 3, 1980. CGD 80-021 Distress Signals; Heptane Ignition Test for Hand Red Flares, July 3, 1980. CGD 78-041 Puget Sound Vessel Traffic Service, July 21, 1980. CGD 80-02 Revisions to Lists of Flammable and Combustible Bulk Cargoes, August 7, 1980. CGD 78-153 Tailshaft Examination, August 7, 1980. CGD 78-041b Puget Sound Vessel Traffic Service (amendment), August 11, 1980. CGD 79-148 Electronic Relative Motion Analyses, August 14, 1980. CGD 80-021A (correction) (see July 3 above), August 14, 1980. CGD 75-238 Notifications of Arrivals, Departures, Hazardous Conditions, and Certain Dangerous Cargoes, August 28, 1980. CGD 79-142 Special Service Load Line Vessels: Operation During the Hurricane Season, August 28, 1980. CGD 77-225 Low Specific Activity Radioactive Material, September 15, 1980. CGD 78-153A (correction) (see August 7 above), September 18, 1980. CGD 77-037 Suspension and Revocation Proceedings, September 29, 1980. CGD 79-165a Revocation of Obsolete Specifications (miscellaneous editorial corrections), September 29, 1980. CGD 79-165b Lifesaving Appliances (editorial amendment), October 2, 1980. CGD 80-133 General Provisions, October 20, 1980. CGD 80-131 Licensing and Certification of Seamen, October 20, 1980.

**Proposed rules:** CGD 75-237 Drawbridge Operation Regulations; Opening Signals for Drawbridges, June 26, 1980. CGD 75-124 Oil Pollution Prevention--Vessels and Marine Oil Transfer Facilities (correction) June 30, 1980. CGD 80-001 Unmanned Barges Carrying Certain Bulk Dangerous Cargoes, July 3, 1980. CGD 78-163 Exception From PFD Carriage Requirement for Sailboards, July 17, 1980. CGD 78-128 Safety Rules for Self-Propelled Vessels Carrying Hazardous Liquids, July 17, 1980. CGD 78-041a Puget Sound Vessel Traffic Service Area (supplemental notice), July 21, 1980. CGD 77-162 Damage Stability Standards for Great Lakes Bulk Dry Cargo Vessels (Advance Notice of Proposed Rulemaking), August 14, 1980. CGD 79-173 Temporary Licenses and Endorsements, August 18, 1980. CGD 79-087 Application for Certificate of Numbers: Change in Required Contents, August 21, 1980. CGD 79-151 Inland Waterways Navigation Regulations--Great Lakes, August 25, 1980. CGD 74-029 Houston-Galveston Vessel Traffic Service (Advance Notice of Proposed Rulemaking), September 18, 1980. CGD 79-158 Deepwater Port Liability Fund, October 2, 1980. CGD 79-095 Shipment of Bulk Liquid Hazardous Waste Cargoes by Water, October 14, 1980.

**Notices:** CGD 80-088 Termination of Approval Notice, August 4, 1980. CGD 80-089 Equipment List (Approval Notice), August 4, 1980. CGD 80-098 Study of Large Tank Barges and Solicitation of Information, August 7, 1980. CGD 80-100 Ship Structure Committee; Renewal, August 11, 1980. COMDTINST 5420.12E Chemical Transportation Advisory Committee (Charter), August 18, 1980. CGD 80-102 Termination of Approval Notice, September 11, 1980. CGD 80-103 Equipment, Construction, and Materials (Approval Notice), September 15, 1980.

Any questions regarding regulatory dockets and any requests from companies and individuals wishing to speak at public hearings should be directed to Commander A. D. Utara (G-CMC/24), U.S. Coast Guard Headquarters, 2100 Second St. SW, Washington, DC 20593; (202) 426-1477.

* * *

## REVISION OF ELECTRICAL REGULATIONS
## CGD 74-125(A)

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

This revision is necessary 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 Notice of Proposed Rulemaking (NPRM) was published on June 27, 1977 (42 FR 32700). A supplemental NPRM was published as CGD 74-125A on March 3, 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 March 17, 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 Federal Register of June 14, 1979 (44 FR 34440 and 44 FR 34443, respectively).

Public hearings on the dockets were held as follows: August 2, 1979, Washington, DC; August 15, 1979, Seattle, Washington; August 23, 1979, New Orleans, Louisiana;

September 5, 1979, Washington, DC; and September 7, 1979, St. Louis, Missouri. The comments made at the hearings have been incorporated in the docket.

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

A Supplementary Notice was published as Part III of the Federal Register of March 13, 1980 (44 FR 16438). This notice informs the public of a deferment in the rulemaking process for these dockets. The comments received have raised significant questions concerning these proposals. It was decided that the entire tank barge pollution problem warranted a carefully considered study by a recognized independent body. The National Academy of Sciences/ National Research Council will conduct the study. Part of the study, a two-day workshop, was held April 15 and 16, 1980. The study will be completed by the end of January 1981. The Coast Guard will defer any further rulemaking on these proposals until completion of the study, and the dates in the proposals of June 14, 1979, are no longer valid. If the Coast Guard should pursue further action on these proposals, a new timetable will have to be developed.

Anyone wishing to obtain copies of the rulemaking may do so by contacting Commander A. D. Utara, 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.

An NPRM was published on June 27, 1977 (42 FR 32670), and a supplemental NPRM was published on October 27, 1977 (42 FR 56625). Because of substantive changes in the regulation, there is currently no scheduled publication date for the final rule.

### SEGREGATED BALLAST AND TANK CLEANING REGULATIONS GCD 77-058(b)

This regulation was initiated when President Carter directed the Secretary of Transportation to issue new rules for oil tanker standards which would include segregated ballast on all tankers and double bottoms on all new tankers which call at American ports. The provisions of these proposed regulations were 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 on May 16, 1977 (42 FR 24868). As a result of the IMCO Tanker and Pollution Prevention Conference of February 1978, a new NPRM was issued on February 12, 1979 (44 FR 8984). Public hearings were then held in March in Washington, DC and San Francisco, California; 265 comments were received on the docket and analyzed. The final rules were published on June 30, 1980.

### 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. Because of 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 ANPRM on these regulations is anticipated in November 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. The NPRM is awaiting approval by the Secretary of Transportation. Publication will follow shortly thereafter.

### 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 into 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 has been deferred pending legislative action in Congress.

### TANK VESSEL OPERATIONS-- 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 March 14, 1978, prohibiting entry of oil tankers in excess of 125,000 deadweight tons

in Puget Sound; this appeared in the Federal Register of March 23, 1978 (43 FR 12257). An ANPRM was published on March 27, 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 for June 11 and 12 in Seattle, Washington, June 13 in Mt. Vernon, Washington, and June 14 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 on June 21, 1979 (44 FR 36174). This extension became effective July 1 and will be in effect until the Coast Guard prints notice of its cancellation. A supplemental NPRM was published on July 21, 1980 (45 FR 48827). 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 December 1981.

### 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 (OCS) legislation. It will provide more comprehensive protection for personnel employed in vessels and installations in the oil trade.

### QUALIFICATIONS OF THE PERSON IN CHARGE OF OIL TRANSFER OPERATIONS, TANKERMAN REQUIREMENTS CGD 79-116 and 79-116A

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

In 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 NPRMs which were anticipated in June have been delayed and are now awaiting approval by the Secretary of Transportation. Publication will follow shortly thereafter.

### 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, specify acceptable methods of compliance, and 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 sound levels aboard several U.S. merchant vessels, study the data obtained, and define the extent of the noise problem. NOSC was asked to use this data and other information available to recommend a set of noise levels to be included in the proposed standards for the control and/or elimination of the shipboard noise problem.

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(B)

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.

**Correction:** In the last issue of the Proceedings (June/July 1980), the docket number for the preceding regulation was mistakenly shown as CGD 79-081(A), and it was stated that the document had been published as an interim rule. The correct docket number is CGD 79-081(B), and publication as a proposed rule is anticipated in November 1980. The title of CGD 79-081(A), the document published as an interim rule on April 7, 1980 (45 FR 23425), is Evaluation of Programs for Licensing and Certification of Foreign Tank Vessel Personnel.

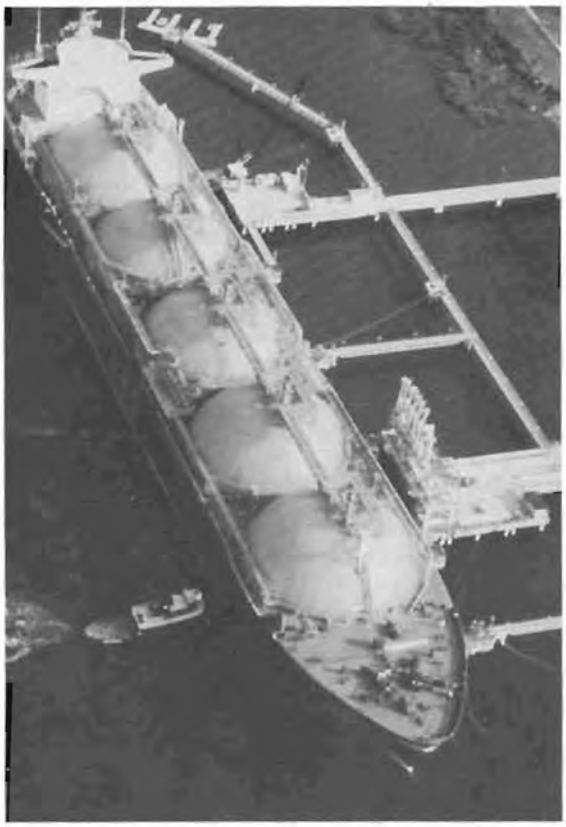
### PERSONNEL SAFETY AND HEALTH REQUIREMENTS FOR INDUSTRIAL VESSELS CGD 80-15

This regulation is similar to CGD 79-077 and covers 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 various industrial functions involved in the exploration and development of offshore resources. The regulations, designed to provide more comprehensive personnel protection, are scheduled for an ANPRM in October 1980.

* * *

**A complete listing of all Coast Guard proposed regulations, both "significant" and "non-significant," appeared in the Monday, August 25, 1980 Federal Register (45 FR 56538).**

**THE COAST GUARD HAS NO PUBLIC HEARINGS SCHEDULED AT THIS TIME FOR NOVEMBER.**



*Right: the SS GOLAR FREEZE is pushed into final position at the Elba Island LNG facility in the Port of Savannah. Below: Lt. Ralph Crawford inspects the shoreside terminal 24 hours before the arrival of the SS GOLAR FREEZE. Opposite page: CWO Chuck Brinson checks equipment on LNG carrier.*

# At ease, Savannah--

*Above: CWO Brinson inspects the cargo handling room of the GOLAR FREEZE before allowing it to enter the Port of Savannah. Opposite page: Captain Harold C. Carlton and CWO Brinson look down the Savannah River across the GOLAR FREEZE's bow.*

# the Coast Guard's on the job

by Dale L. Puckett

The 56-foot pilot boat bobs like a cork in the swells of the Atlantic just beyond the sea-buoy that guides more than 4,000 large commercial ships into the Port of Savannah each year.

By comparison, the huge orange liquefied natural gas (LNG) carrier is as stable as a seawall. To the pilot in the Coast Guard helicopter 500 feet above, Chief Warrant Officer Chuck Brinson looks like an ant on the small boat's deck.

Brinson is checking the draft marks on the side of the SS GOLAR FREEZE. He has to make sure that the carrier has enough clearance to navigate the shallow waters of the Savannah River channel.

"You don't realize how really big these things are until you pull alongside," Brinson says. "As you approach, you find yourself looking down the side of a vessel that is longer than three football fields placed end to end--950 feet. She is nearly 50 yards wide, and her superstructure rises more than 140 feet above the waterline. She carries enough natural gas to keep a city of 50,000 people warm for a month."

Brinson is the vanguard of a carefully-planned Coast Guard operation designed to ensure the safety of commerce moving in the Port of Savannah while liquefied natural gas is being delivered to the Southern Natural Gas Company terminal on nearby Elba Island. Despite the size of the ships and the responsibility involved, it is an operation that has become routine to each of the 25 men and women assigned to the local Coast Guard Marine Safety Office. Yet, the job is not without an element of danger.

"Just getting aboard the LNG ship is a trick," Brinson says. "You have to get from the pilot boat onto a rope ladder--and all this time the boat is moving up and down along the side of the ship. When you finally reach the rope ladder, you must climb 10 to 15 feet and then leap onto an accommodation ladder. You're really in trouble if you look below. It's very easy to get dizzy when you suddenly realize the water is more than 100 feet straight down."

Fortunately, Brinson has a lot to keep his mind busy while he climbs the ladder.

"You keep going over the inspection list in your mind," he says. "You ask yourself, 'What would it take to make me hold up one of these ships?' You know if you do, it will cost the company thousands of dollars."

Once aboard the vessel, Brinson introduces himself to the mate with a firm handshake and goes right to work. Still, nearly an hour will pass before he finally gives the master permission to enter the Port of Savannah.

He checks the cargo manifest. He takes the vessel's safety plan and goes through every step of a long checklist. He turns on the sprinklers that extend over the giant LNG tanks. As he does this, a foggy mist forms over the huge tanks, and from the bridge it looks like four enormous orange hot-air balloons are moving through the clouds.

But the inspection shows that all is well, and the vessel steams toward the Savannah River.

To the uninitiated on the bridge of the LNG ship, it appears that the pilot is trying to thread a heavy nylon line into a number three needle. Slowly but surely, however, the mouth of the river seems to grow wider, and the pilot eases the ship into the buoyed channel with 50 to 60 yards to spare on each side.

Shortly after the GOLAR FREEZE enters the river, a 32-foot Coast Guard utility boat slips into position in front of the huge carrier, its blue safety light flashing brightly. Above, a Coast Guard helicopter watches for traffic that might cause a problem, and at the river's intersection with the Intercoastal Waterway, a 17-foot Coast Guard boat holds up all traffic until the LNG ship has passed.

Three hours after he boarded the GOLAR FREEZE at the sea-buoy, Brinson walks down the gangway at the Elba Island terminal and joins Lt. Ralph Crawford. The two compare notes and make plans to allow the offloading of the liquefied natural gas.

Crawford had inspected the shore facility 24 hours

before the ship's arrival. He checked the cargo transfer equipment, the fire protection equipment, and all safety devices. If any of the equipment had flunked the inspection, the terminal crew would have had 24 hours to solve the problem.

"I like to make sure the ultraviolet sensors are working properly because they can detect the heat intensity of a fire before the human eye can see it," Crawford says. "If a fire were to break out, the sensors would cause the plant's computer to shut down any transfer operation immediately."

Crawford also tests every gas sensor at the dock and makes sure that all dry chemical fire protection equipment is in order. He operates the giant chicksam arms that lower the transfer pipes from the dock to the ship and tests the emergency shutdown system that would take over should the ship be pulled away from the dock during the transfer.

Both Brinson and Crawford work for Capt. Harold C. Carlton, Captain of the Port of Savannah. Carlton controls all traffic in the Savannah River, and the monitoring of an LNG movement is only a small part of his job; yet for a 24-hour period almost every other week, he must use 18 of his people for this job.

"While the LNG transfer is being monitored, I wonder in the back of my mind what else might occur," Carlton says. "There could be an oil spill that would require a large crew to monitor and clean up. There could be a fire aboard a vessel that would require our immediate attention. There are ammonium nitrate and anhydrous ammonia shipments through the port all the time. They require constant monitoring."

Carlton's men and women are busy--but they are also appreciated.

"The leadership and the coordination provided by the Marine Safety Office of the U.S. Coast Guard are certainly something we can all be proud of," says George Nicholas, the president of the Georgia Ports Authority. "The tremendous growth in the number of ships calling at the Port of Savannah and the increased number of energy ships that are coming in provide a serious challenge. However, the Coast Guard has it all under control."

The general public also seems to recognize the effectiveness of the work done by the Captain of the Port and his crew. A woman who lives across the river from the Elba Island terminal says, "Even though the tanks are in full view as I cross the bridge to work each morning, I rest easy because I know that when those ships arrive, the Coast Guard is watching every minute that the gas is being transferred."


*Right: Lt. Ralph Crawford leaves the GOLAR FREEZE after a final check before allowing the Elba Island crew to start offloading the LNG. Below: the sun sets over the chicksam arms that carry the LNG from the huge carrier to the shoreside terminal. Offloading began five hours after the ship departed the sea buoy.*

# Chemical of the Month

## ANHYDROUS AMMONIA: $NH_3$

| | |
|---|---|
| synonyms: | ammonia gas, liquid ammonia |
| **Physical Properties** | |
| boiling point: | -33.4° C (28.1° F) |
| freezing point: | -77.7° C (-107.9° F) |
| vapor pressure at 46° C (115° F): | 18.1 atm (266 psia) |
| **Threshold Limit Values** | |
| time weighted average: | 25 ppm (0.0025 %) |
| short term exposure limit: | 35 ppm (0.0035 %) |
| **Flammability Limits in Air** | |
| lower flammability limit: | 16 % |
| upper flammability limit: | 25 % |
| **Densities** | |
| liquid density: | 0.68 (water = 1.0) |
| vapor density: | 0.6 (air = 1.0) |
| **Identifiers** | |
| U.N. Number: | 1005 |
| CHRIS Code: | AMA |

Anhydrous ammonia is a commonly shipped commodity which must be handled with care because of its toxic qualities. Breathing ammonia vapor in a concentration of 5000 ppm (0.5 %) will cause immediate death, while exposure to a vapor concentration of 700 ppm (0.07 %) will cause damage to the eyes. To reduce shipping costs, the ammonia is reduced in volume through liquefaction by refrigeration or pressurization. Contact with the refrigerated liquid can result in frostbite, as can contact with any object whose surface temperature has been reduced by contact with the liquid (pipings, valves, etc.). Although ammonia is flammable, sustained burning will not take place unless the fuel-air mixture is pressurized or heated or oxygen is present rather than air. (The Department of Transportation classifies ammonia as a non-flammable gas.) Ammonia is caustic in both its liquid and vapor states. Fortunately, ammonia is lighter than air when both are at the same temperature and so disperses readily.

"Anhydrous" means "without water" and is used to refer to ammonia in its pure form, i.e., ammonia containing no water. Ammonia compounds were first used by the Egyptians in the fourth century B.C., but ammonia was not produced synthetically in large quantities until after 1910. Interestingly, much of the atmosphere of Jupiter and Saturn is composed of ammonia. While some ammonia is produced naturally on earth, the amount is negligible compared to the amount produced synthetically.

Anhydrous ammonia is usually made from natural gas. It is applied directly as a fertilizer and used in the manufacture of other fertilizers, explosives, inorganic and organic chemicals, and cleaning agents; many people have ammonia-derived cleansers in their homes. Anhydrous ammonia is produced in great quantity. In 1979 over 18 million tons were produced in the United States; only sulfuric acid and lime were produced in greater quantity.

Anhydrous ammonia is regulated by the U.S. Coast Guard, the U.S. Department of Transportation, the Environmental Protection Agency, and the Inter-Governmental Maritime Consultative Organization. It is classified as a liquefied gas by the Coast Guard. Because of its toxic effects, the Coast Guard requires that it be shipped in Type II hulls and that closed gauging be used to limit crew exposure.

The Coast Guard completed a small-scale ammonia spill R&D program in 1974 and is conducting a large scale test series involving spills on water as well as on land. The purpose of the study is to learn how the ammonia interacts with the water on which it is spilled and how the vapor disperses downwind.

ALAN SCHNEIDER, Sc. D. and CURTIS PAYNE, B. A.

HAZARD EVALUATION BRANCH
CARGO AND HAZARDOUS MATERIALS DIVISION

## A Time For Thanks

# Nautical Queries

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

DECK

(1) You are attempting to locate your position with reference to a hurricane center in the Northern Hemisphere. If the wind direction remains steady but velocity diminishes with time, you are most likely

A. in the right semicircle.
B. in the left semicircle.
C. on the storm track ahead of the center.
D. on the storm track behind the center.

REFERENCE: Meteorology (Donn)

(2) An inert gas system installed on a tanker is designed to

A. aid in the stripping and cleaning of cargo tanks.
B. increase the rate of discharge of cargo.
C. force toxic and explosive fumes from a cargo tank to vent to the outside atmosphere.
D. lower the oxygen levels inside cargo tanks, making explosion nearly impossible.

REFERENCE: Tanker Operations (Marton)

(3) A yellow signal floating in the air from a small parachute about 300 feet above the water would indicate that a submarine

A. has fired a torpedo during a drill.
B. is about to rise to periscope depth.
C. is on the bottom in distress.
D. is disabled and unable to surface.

REFERENCE: Coast Pilots (under General Information)

(4) Which condition is necessary for a substance to burn?

A. The temperature of the substance must be equal to or above its flash point.
B. The air must contain oxygen in sufficient quantity.
C. The mixture of vapors with air must be within the "explosive range."
D. All of the above.

REFERENCE: CG 329

(5) Because radio waves travel great circles, which type of chart may require corrected plotting?

A. Lambert conformal
B. Gnomonic
C. Stereographic
D. Mercator

REFERENCE: Dutton 13th Edition

ENGINEER

(1) In a main propulsion turbine, where are the moisture shields located?

A. Around throttle valve stems
B. At the steam strainer inlet
C. At the inner stage diaphragms
D. On the last stages of the rotor blading

REFERENCE: Harrington, Osbourne

(2) A water-jacket is frequently placed around the exhaust manifolds of propulsion diesels. This is done to

A. reduce heat radiation to the engine room.
B. aid in preventing turbocharger overheating.
C. condense and drain moisture from exhaust gases.
D. dampen exhaust gas pulsations in the manifold.

REFERENCE: Maleev, Engineman 2 and 3

(3) Allowances may be made for expansion and contraction in piping by the use of expansion joints or

A. unions.
B. retractable flanges.
C. union bulkhead fittings.
D. bends or loops in the line.

REFERENCE: Principles of Naval Engineering

(4) If you hear more than six short blasts and one long blast of the whistle supplemented by the same signal on the general alarm, you should

A. start the fire pump.
B. go to your man overboard station.
C. go to your lifeboat station.
D. stand by for collision.

REFERENCE: Osbourne

(5) A Marine Chemist's Certificate stating that a tank or void space is safe for men to enter is valid only if

I. work has begun in the tank or void within 24 hours of the certificate's issuance.

II. there is no change in the status of vessel, tank, or void space.

A. I only
B. II only
C. Both I and II
D. Neither I nor II

REFERENCE: CG 174

ANSWERS

Engineer
1.D; 2.A; 3.D; 4.C; 5.C

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

## 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 |
|---|---|---|

**NOTE: This is a newly revised list; please check carefully for changes.**

| | | |
|---|---|---|
| 1 | 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, 6-18-75, 9-26-77, 5-12-80. |
| 4 | 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, 2-19-80, 4-21-80, 9-29-80. |
| | CG-123 | Rules and Regulations for Tank Vessels (8-1-77). Ch-1, 4-78. FR 1-3-77, 8-18-77, 9-12-77, 9-26-77, 9-29-77, 1-11-79, 3-12-79, 5-3-79, 6-14-79, 7-2-79, 11-19-79, 12-27-79, 1-31-80, 3-3-80, 4-3-80, 4-7-80, 4-10-80, 4-14-80, 5-5-80, 5-30-80, 8-7-80, 9-29-80. |
| | 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. |
| 1 | CG-174 | Manual for the Safe Handling of Flammable and Combustible Liquids and Other Hazardous Products (9-1-76). |
| 1,2 | CG-175 | Manual for Lifeboatmen, Able Seamen, and Qualified Members of Engine Department (3-1-73). |
| 1,2,4 | 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, 7-24-78, 8-28-80. |
| | 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. |
| | OLD CG-190, | Equipment Lists (8-1-79), now M16714.3. |
| 1 | CG-191 | Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel (11-1-76). FR 3-3-77, 5-16-77, 8-8-77, 4-9-79, 12-6-79. |
| | CG-227 | Laws Governing Marine Inspection (7-1-75). |
| | CG-242 | International Conventions & Conferences on Marine Safety (6-51). |
| 1,2,5 | CG-257 | Rules and Regulations for Cargo and Miscellaneous Vessels (8-1-77). Ch-1, 3-17-78. FR 1-31-77, 9-26-77, 9-29-77, 12-19-77, 10-10-78, 1-11-79, 3-12-79, 5-3-79, 6-14-79, 7-2-79, 4-10-80, 5-5-80, 9-29-80. |
| | CG-258 | Rules and Regulations for Uninspected Vessels (4-77). FR 9-26-77, 9-29-77, 6-14-79, 7-2-79, 12-17-79, 2-4-80, 2-19-80. |
| | 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. |
| 1 | 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 9-26-77, 10-25-77, 12-15-77, 7-17-78, 3-12-79, 6-14-79, 7-2-79, 12-13-79, 2-19-80, 3-3-80, 9-29-80. |
| | CG-329 | Fire Fighting Manual for Tank Vessels (1-1-74). |
| 3 | CG-388 | Chemical Data Guide for Bulk Shipment by Water (1976). |
| 1 | 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. |
| 1 | CG-467 | Specimen Examinations for Uninspected Towing Vessel Operators (10-1-74). |
| | CG-474 | When You Enter That Cargo Tank (3-76). |
| | OLD CG-478, | Liquefied Natural Gas and Liquefied Petroleum Gas, Views and Practices, Policy and Safety (3-80), now M16616.4. |
| | 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. |
| 3 | 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, 12-20. 1977--1-3, 5-16, 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, 8-10, 9-11, 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, 4-24, 5-3, 5-7, 5-31, 6-14, 6-21, 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, 2-4, 2-19, 3-10, 3-20, 3-24, 3-31, 4-10, 4-14, 5-5, 5-8, 5-19, 5-22, 6-26, 6-30, 7-17, 7-21, 8-7, 8-11, 8-14, 8-18, 8-28, 9-29. |
| 1 | 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. 4-10-80, 5-5-80, 7-3-80, 9-29-80. | |

---

1 Temporarily out of stock
2 Under revision
3 Available only through Superintendent of Documents (SupDocs)
4 Text can be found in Title 46 of the Code of Federal Regulations, Parts 41-69
5 Text can be found in Title 46 of the Code of Federal Regulations, Parts 90-109.

U.S. GOVERNMENT PRINTING OFFICE : 1980 O - 333-099