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When you have finished reading this issue, please pass it on.

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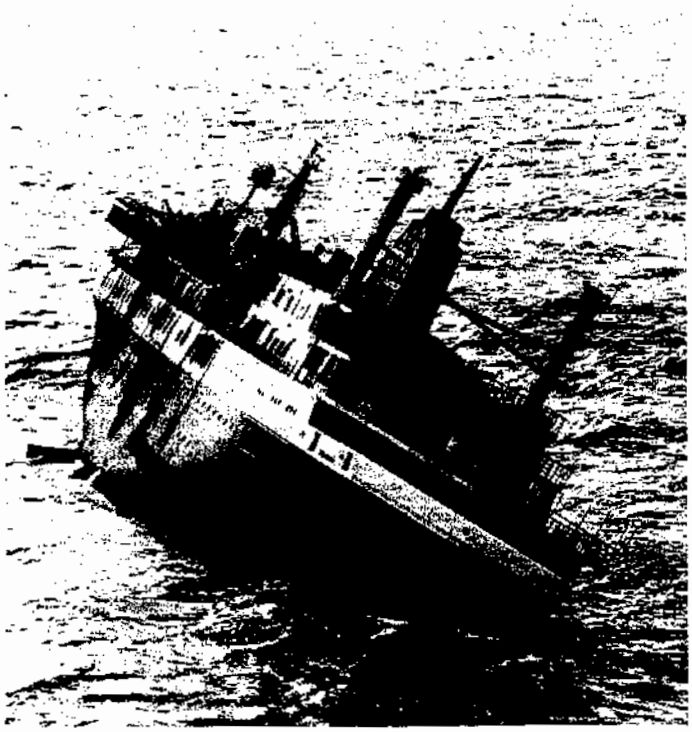
Cover

Survivors from the PRINSENDAM disaster prepare ta be rescued from their lifeboat. The story, courtesy of the U.S. Coast Guard's Historian's Office, begins on page 107. Cover: Official U.S. Coast Guard photograph by David Cook.

The PRINSENDAM

All 519 persons aboard the burning cruise ship PRINSENDAM were rescued through the combined efforts of the United States and Canada, making this the largest single-ship rescue ever recorded.



The PRINSENDAM, badly listing to port, begins to sink in 9,000 feet of water. Official U.S. Coast Guard photo.

The rescue of 519 people from the burning luxury liner PRINSENDAM, in October of 1980, has been described by some as the most miraculous air/sea rescue of modern times. The U.S. Coast Guard, the U.S. Air Force, the Canadian Armed Forces, and the Merchant Marine played instrumental roles in the rescue. The absence of any one of these organizations might well have meant death for the passengers and crew of the PRINSENDAM.

The cruise ship PRINSENDAM was a 427-foot liner owned by Holland/America lines of the Netherlands. Built in 1973, the vessel conformed to all safety requirements of the 1960 International Convention for the Safety of Life at Sea (SOLAS). It was also built according to the requirements of IMCO Resolution A-122(V) for structural fire protection, requirements which were later incorporated into the 1974 SOLAS guidelines.* Worth $50 million, the vessel had a breadth of 62 feet, a draft of 19 feet, could cruise at 19 knots, and had a gross register of 9,000 tons. PRINSENDAM's hull was stabilizer-equipped for a smooth ride under its diesel power. It was the newest of Holland/America's fleet of five luxury liners.

As for amenities and creature comforts, PRINSENDAM was equipped with a swimming pool, a restaurant, three bars, a cinema, a shopping center, and 209 staterooms.

**While the rescue efforts were successful, the standards that the vessel were built to also played an important role in providing time for the rescue to occur. A future article will discuss this issue.*

The Fire

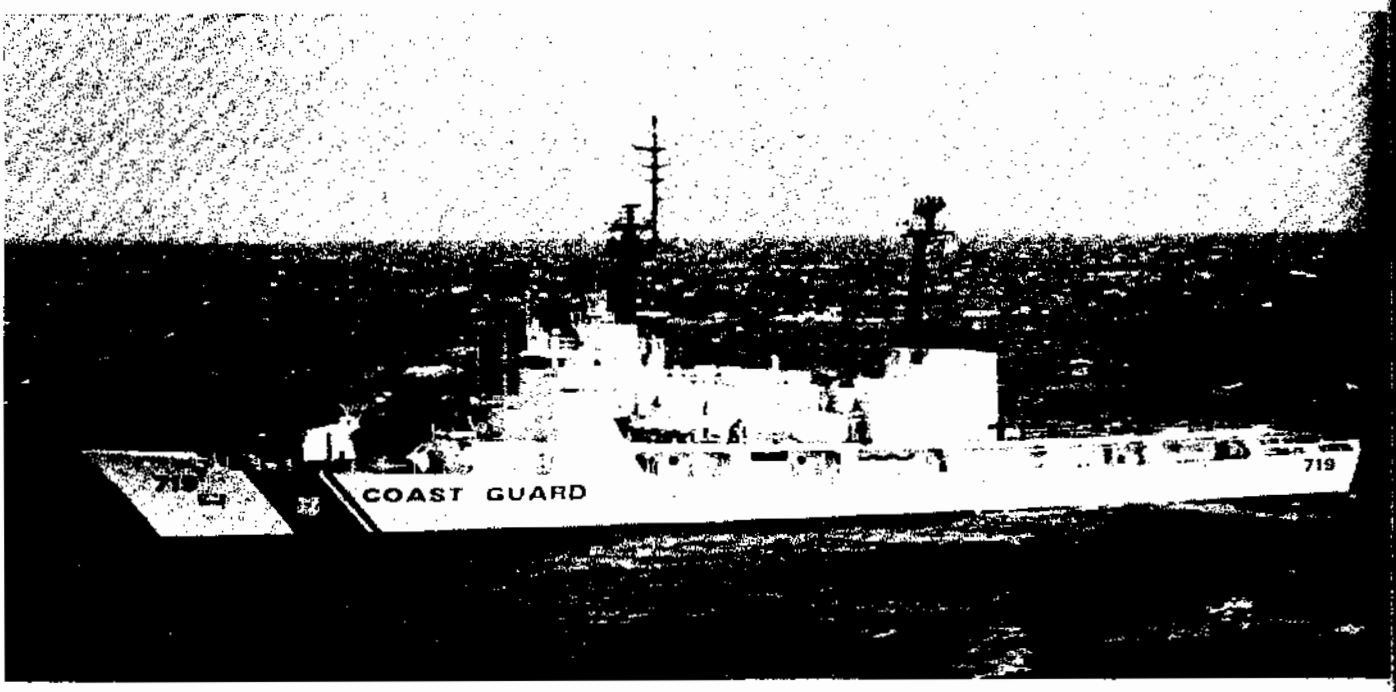
PRINSENDAM left Vancouver, British Columbia, on Tuesday, September 30, for an extensive 31-day cruise through the inside passage of southeast Alaska to Ketchikan, Shanghai, Hong Kong, and Singapore. A total of 519 persons were aboard the vessel: 164 Indonesian crew members, 26 Dutch officers, and 329 passengers, most of whom were elderly. PRINSENDAM moored in Ketchickan on the night of Wednesday, October 1, and took on fuel. When the vessel left Ketchikan on the following day, it carried 200,000 gallons of diesel fuel. By Friday evening, October 3, PRINSENDAM was in the Gulf of Alaska enroute to the Far East.

At 1:00 a.m. Saturday morning, October 4, Coast Guard Communication Station San Francisco received a distress call from PRINSENDAM reporting an engine room fire. Crew members were unable to extinguish the fire even after discharging the fixed CO_2 system.

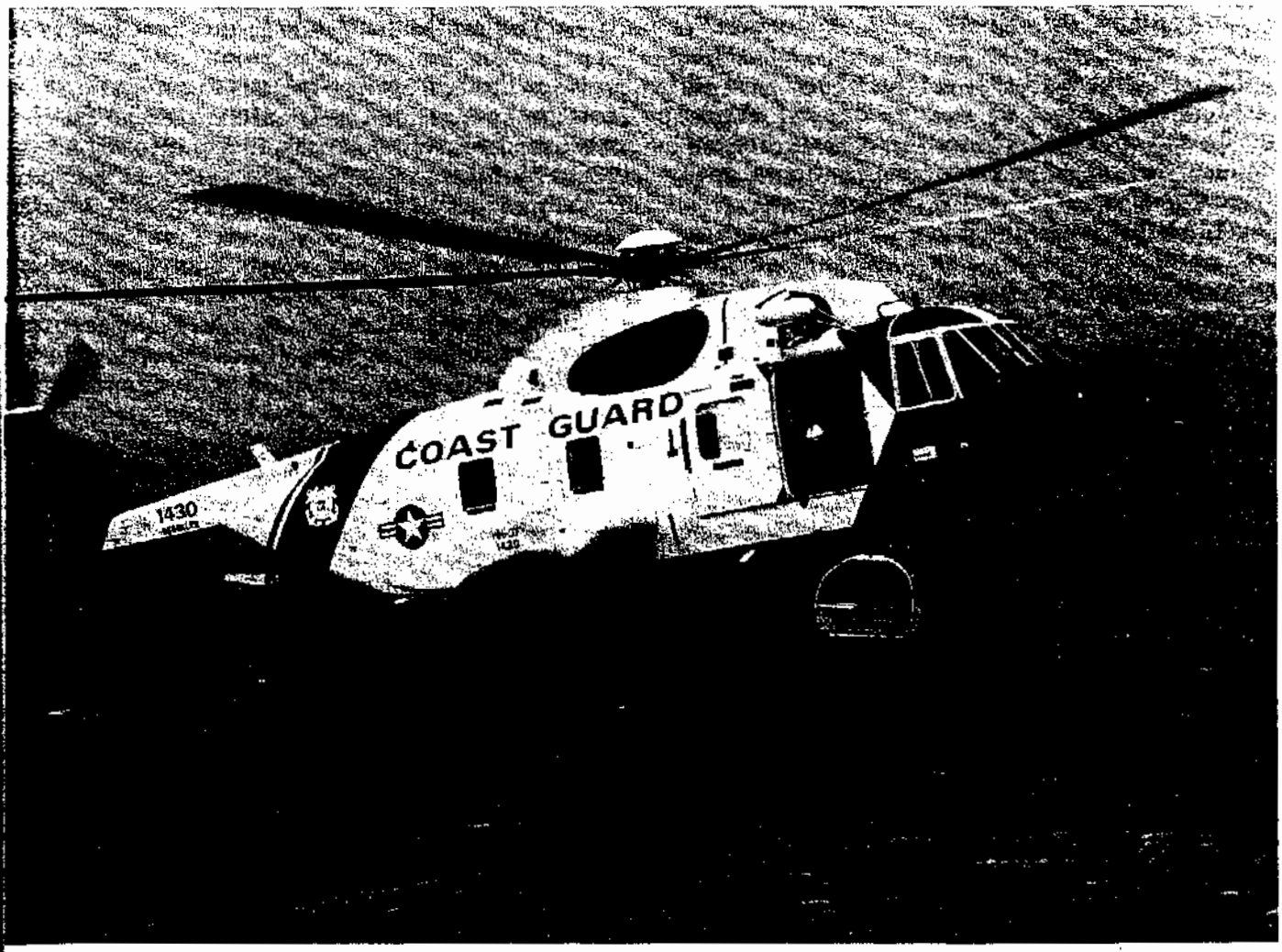
Rescue Equipment Is Mobilized

San Francisco notified the Coast Guard's Rescue Center in Juneau, Alaska, of PRINSENDAM's problem. The Coast Guard's primary rescue resources were located in Sitka, Alaska, 195 miles from the distress position; in Juneau, 230 miles; and in Kodiak, Alaska, 429 miles. Within an hour, the following units were responding:

— Coast Guard Cutter BOUTWELL, a 378-foot, high-endurance cutter equipped with diesel and gas turbine engines. BOUTWELL had left her home port of Seattle and had moored in Juneau to participate in that city's centennial celebration.
— Coast Guard Cutter WOODRUSH, a 180-foot buoy tender homeported in Sitka. WOODRUSH carries a crew of 62.
— Coast Guard Cutter MELLON, a 378-foot,



Coast Guard Cutter BOUTWELL. Official U.S. Coast Guard photo.



An H-3 helicopter assisted in the PRINSENDAM rescue. Official U.S. Coast Guard photo.

high-endurance cutter homeported in Seattle. MELLON was enroute to an offshore fisheries patrol and was diverted to the scene.

— Four H-3 helicopters, two from Air Station Sitka and two from Kodiak. These helicopters are equipped with twin jet engines and can hoist a rescue basket or harness while hovering over open water.

— Two HC-130 cargo planes from Coast Guard Air Station Kodiak.

— Two CH-46 helicopters from the Canadian Armed Forces supplied by the RCC VICTORIA.

— Two Canadian "Buffaloes" and one "Argus" (all fixed wing aircraft).

In addition, the U.S. Air Force at Elmendorf Air Force Base, Alaska, supplied an H-3 helicopter and an HC-130 refueler. These particular rescue resources were very important. While Coast Guard helicopters had to return to land every couple of hours for fuel, the U.S. Air Force team stayed on the scene for 12 hours.

Perhaps the single most important resource was the 1,000-foot tanker WILLIAMSBURG. The WILLIAMSBURGH had just left Valdez, Alaska, with a full load of Alaskan crude and was diverted by the Rescue Center in Juneau to the distress scene 5 hours away. Carrying a million and a half barrels of oil, WILLIAMSBURGH rode low in the water and was exteremly stable. She was equipped with a helicopter pad and had room to house all 519 survivors. Two other ships, the SOHIO INTREPID and the merchant vessel PORTLAND, also responded to the emergency.

Rescue Equipment Reaches the PRINSENDAM

A Coast Guard C-130 was the first rescue resource on the scene, arriving at 4:00 a.m. on Saturday, October 4. The pilot reported seeing flames and heavy smoke from the midsection of the ship. Because the ship had lost power and could not generate water pressure for onboard firefighting, the fire had begun to spread forward and up. At 5:15 a.m., the Master of the PRINSENDAM gave the order to abandon ship.

Six lifeboats, one covered motor launch, and four liferafts were used to carry everyone from the ship. These vessels were launched into 5- to 10-foot seas and 10- to 15-knot winds. Because the abandon-ship order had come so early in the morning, most of the passengers were wearing only light nightclothes. No one was allowed back below decks before abandoning ship, but the officers and crew provided lifejackets to each of the passengers. A 50-man crew remained on board the PRINSENDAM and attempted to fight the fire.

The tanker WILLIAMSBURGH and rescue aircraft arrived at the scene at about 8:00 a.m. Helicopters began to pluck the survivors from lifeboats and liferafts and deposit them on the tanker. Passengers in each lifeboat had established a priority for who would be lifted first. Considering the number of elderly, the hoisting process was tedious, but it moved quickly.

The real enemy during this rescue was an approaching bad weather front. The weather deteriorated steadily during the day, making hoisting operations difficult. Winds quickly increased to over 25 knots, and the seas grew to 20 to 35 feet. BOUTWELL arrived on scene at 1:45 p.m., and the WILLIAMSBURGH headed for Yakutat, Alaska.

Deteriorating weather and approaching darkness forced helicopter operations to be stepped up. By this time, five to six helicopters were simultaneously airlifting survivors to safety. By 4:30 p.m., one lifeboat of survivors remained to be transferred.

A Lifeboat Is Unaccounted For

Once aboard BOUTWELL or WILLIAMSBURG, the survivors received immediate medical attention, blankets, and food. By 6:15 that evening, all of the 519 survivors were believed to be accounted for on either the BOUTWELL, the WILLIAMSBURGH (in Yakutat), or in Sitka. At this time, the PORTLAND and the SOHIO INTREPID were released from rescue operations, and the WILLIAMSBURGH left Yakutat for Valdez with survivors on board. BOUTWELL remained on the scene to transfer two serious medical cases ashore by helicopter.

A head count of survivors indicated that two Air Force pararescue men were unaccounted for. They were known to have been lowered into a lifeboat containing about 18 survivors earlier in the afternoon. Confirmation that a lifeboat was missing came from the SOHIO INTREPID. The INTREPID's message stated that the lifeboat was last seen just before a U.S. Air Force helicopter was forced to make an emergency landing on her deck. During the excitement and worsening weather conditions, the lifeboat was evidently overlooked.

At 12:15 a.m. on Sunday, October 5, the BOUTWELL and WOODRUSH began searching for the missing lifeboat. Fortunately, BOUTWELL located the craft within 45 minutes. All 18 survivors and both pararescue men were

taken aboard, and the BOUTWELL headed for Sitka.

Late in the afternoon of October 5, BOUTWELL arrived at Sitka. Survivors were shuttled to shore by the motor vessel ST. NICHOLAS to meet with authorities and be bused to hotels. The scene was similar in Valdez, where the most of the PRINSENDAM's passengers had been taken by the WILLIAMSBURG. At this time, the survivor list and the master manifests held by Holland/America Lines were double-checked. Family members who had been separated during rescue operations were happily reunited.

A final tally of survivors revealed that WILLIAMSBURGH had taken 370, Boutwell took 87, and 68 had been airlifted to Sitka. All passengers, crew, and pararescue men were accounted for.

The End of the PRINSENDAM

The Coast Guard Cutter MELLON arrived on the scene on October 5, approximately 4 hours after BOUTWELL had picked up the missing lifeboat and departed for Sitka. The MELLON and WOODRUSH spent the remainder of the day marking lifeboats and rafts used by the survivors.

On Monday, October 6, the PRINSENDAM was a burning hulk drifting in a northwesterly direction at approximately 2 knots. WOODRUSH departed the scene while MELLON and an H-3 helicopter waited for the ocean-going tug COMMODORE STRAITS from Vancouver. At the request of the U.S. Coast Guard, the tug was to tow PRINSENDAM a distance of 50 miles or more off the shore of Alaska while enroute to Portland, Oregon.

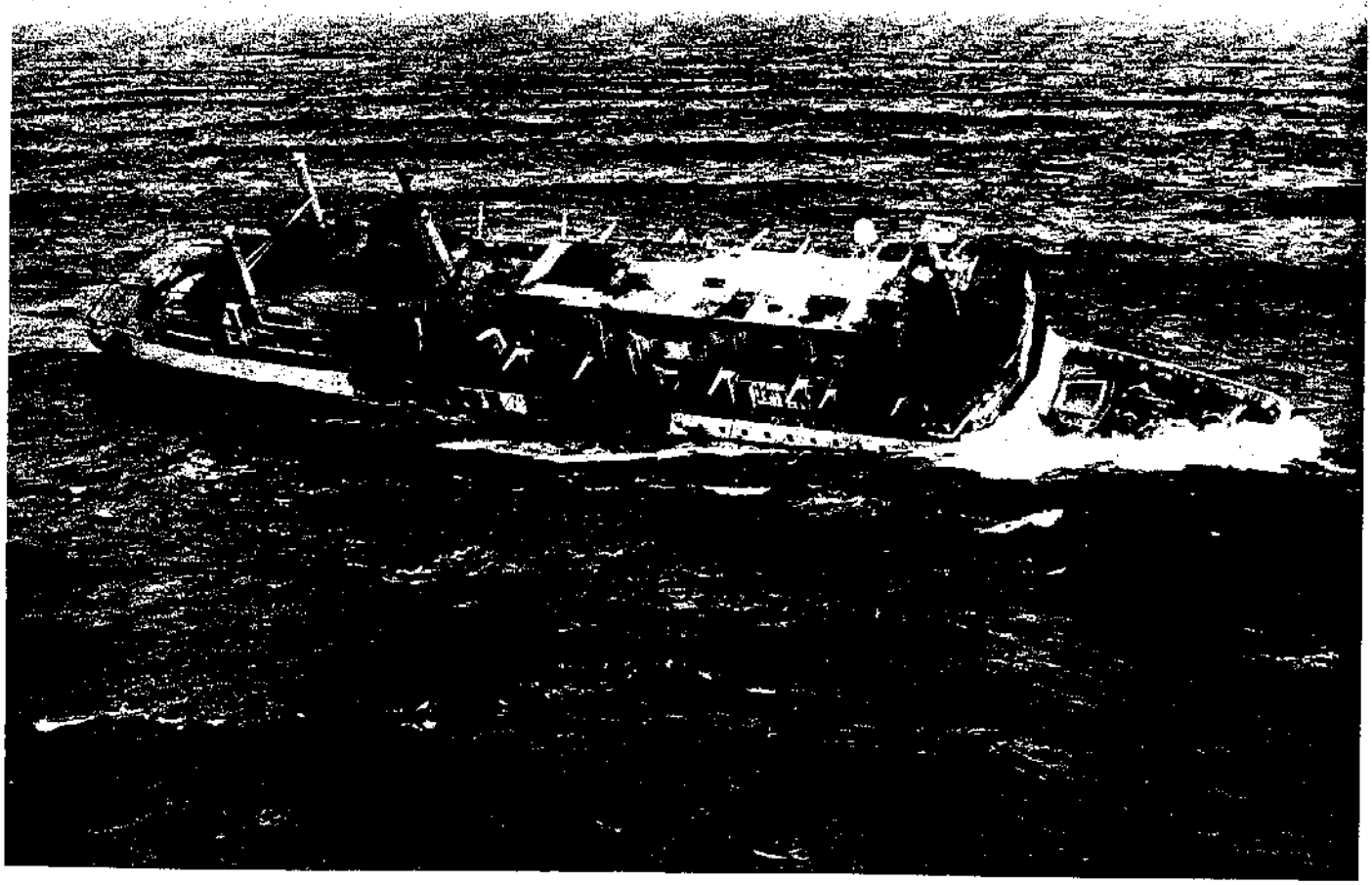
At 1:30 p.m. on October 6, heavy smoke poured from the PRINSENDAM due to a simultaneous ignition of 15 rolls of carpeting and a liferaft stored on her upper deck. By 5:30, when the COMMODORE STRAITS had arrived on the scene, the smoke had subsided.

On Tuesday, October 7, a nine-man team was put on board the stricken vessel to arrange the towing lines and assess fire damage. By midafternoon, the COMMODORE STRAITS had the PRINSENDAM under tow.

Evidence of the fire's intense heat could be seen in most topside spaces. In many areas around the upper decks, paint had literally blistered off. Various "hot spots" could be seen, as could the direction in which the fire was spreading. Portholes burst from the heat as the fire progressed. As a result, the vessel was shipping water, listing, and becoming difficult to tow. By Thursday, October 9, the upper decks of the vessel were extensively burned out, and the bridge area was at the point of total collapse.

By midmorning on Friday, October 10, the PRINSENDAM was exhibiting a mind of its own

The COMMODORE STRAITS prepares to tow the PRINSENDAM to Portland, Oregon. Official U.S. Coast Guard photo.



The PRINSENDAM took just 3 minutes to sink. Official U.S. Coast Guard photo by David Cook.

about where it wanted to be towed. Water was flowing in and out of the broken portholes as a result of a 35° list. From time to time, water would rush over the main deck. The vessel was rolling from 20° port to 35° starboard, sustaining an 11-second roll on her starboard side. The COMMODORE STRAITS had increasing difficulty in moving PRINSENDAM at constant course and could move at a speed of only 2 to 3 knots.

By Saturday, October 11, the PRINSENDAM was listing 40-45° to starboard and had reduced the COMMODORE STRAITS' speed to 1 to 2 knots. At 3:30 a.m. on October 11, the hulk rolled on its starboard side and sank within 3 minutes in 9,000 feet of water. Fortunately for the passengers and crew, the PRINSENDAM itself was the only casualty from this fire. ⚓

The Editor wishes to thank the U.S. Coast Guard's Historian's Office for the preceding story and pictures.

'Tis the Season. . .

SOME COAST GUARD TIPS FOR SAFE BOATING

Here are some rules for boating safety:

- Know how to swim.
- Know the boating "rules of the road."
- Board by stepping into the center of the boat.
- Distribute the load evenly—NEVER overload.
- Each person should wear a U.S. Coast Guard-approved life jacket.
- Check for leaks and defects before leaving the shore or dock.
- Have plenty of fuel—avoid fire hazards while refueling.
- Take along a bailing can, whistle or horn.
- Start slowly and avoid high-speed turns.
- Reduce speed when passing bathing beaches, canoes, small boats or marinas.
- Keep clear of large vessels.
- Keep a good lookout for bad weather, other boats, swimmers, obstructions, fishermen and skiers.
- If caught in foul weather, reduce speed, head into waves at a slight angle, make for the nearest shelter or harbor, and seat passengers on the bottom of the boat near center line.
- If the boat swamps or capsizes, keep life jackets on and stay with the boat.
- If someone falls overboard, throw that person any flotation device and extend an oar or line. Never leave the boat unattended.

Additional boating safety information is contained in two Coast Guard publications, "A Pocket Guide for Visual Distress Signals" and "Federal Requirements for Recreational Boats," which are stocked at all Service publication centers. Individual copies are available from local recreation offices.

Crime On the High Seas

LCDR William J. Morani, Jr.
Fishing Vessel Safety Task Force
U.S. Coast Guard

On April 9, 1982, the Master of a U.S. commercial fishing vessel was convicted by a jury in the U.S. District Court, Providence, Rhode Island, of violating Title 18, U.S. Code, Section 2191, "Cruelty to Seamen." The Master was found guilty of inflicting corporal punishment and withholding suitable food and nourishment from members of his crew, knowingly and without justifiable cause, on two separate occasions. Although the Master could have been fined a total of $6,000 or imprisoned not more than 30 years or both, he received a 2-year suspended sentence, 2 years' probation, and a fine of $2,500.

This case illustrates the Coast Guard's commitment to the safety and welfare of all seamen. During the criminal investigation leading up to the indictment and throughout the trial that followed, U.S. Coast Guard investigating officers assisted the Federal Bureau of Investigation and other branches of the Department of Justice in bringing this case to a close.

Investigators in the Marine Safety Office (MSO), Providence, first became aware of the incident through a telephone complaint. Present Coast Guard policy dictates that telephone complaints may be sufficient to commence a personnel investigation. The basic purposes of Coast Guard personnel investigations are to (1) promote safety on the high seas and navigable waters of the United States and (2) prevent or mitigate personnel-instigated hazards to life, property, and the marine environment.

On the surface, the initial telephone complaint appeared to be nothing more than a disagreement between the Master and crew or even a prank call; however, once the investigation was initiated, the complaint turned out to be much more.

The Complaint

Investigating officers from MSO Providence contacted one of the crewmen and obtained the facts surrounding the incident. Investigating officers learned that during July 11 to July 28, 1981, five of the crewmen were forced to work long shifts, sometimes over 12 hours straight. Some of

the crewmen even collapsed due to exhaustion. At one point, they were locked up in the forward compartment, below decks, only to be let out to work or to get a breath of fresh air. During their confinement, they were fed scraps from other crewmen's plates which were lowered to them in a bucket. However, it was not until the trial that the full extent of their mistreatment was made public.

What Law Was Violated?

One of the first problems facing investigating officers was to determine what law, if any, was violated by the Master's conduct. Volume V, Part 72-1-20B of the **Marine Safety Manual (Investigations)** lists several legal references which investigation departments should have. One of the recommended texts, Norris' **The Law of Seamen,** proved to be of immense value. Chapter 10, Volume 1 in this three-volume set deals with criminal offenses and includes topics ranging from "Special Maritime and Territorial Jurisdiction of the United States" to "Revolt or Mutiny" and "Assault on Seamen by the Master." The latter section directed Coast Guard investigating officers to 18 U.S.C. 2191, "Cruelty to Seamen."

If the vessel upon which the incidents took place was required by law or regulation to be manned by officers and personnel licensed or documented by the U.S. Coast Guard, then the Coast Guard could have taken action only against the Master's license and/or merchant mariner's document. Suspension and revocation proceedings, authorized in Title 46 U.S. Code, Section 7703, are administrative actions directed solely against the license and/or document, not against a person or his property. In a nutshell, the Coast Guard can take actions only to revoke Coast Guard licenses or documents.

As a U.S. fishing vessel of less than 200 gross tons, this vessel was exempt by statute from meeting any federal standards dealing with personnel licensing or manning. Therefore, the only action available to the Coast Guard was through the criminal justice system.

Alerting the Department of Justice

Generally speaking, Coast Guard marine casualty investigating officers are not trained as criminal investigators. It is Coast Guard policy that the documentary evidence and facts indicating criminal liability are forwarded to the Department of Justice for possible prosecution. However, this case warranted immediate action: witnesses, as well as the vessel and her Master, were available but could ship out at any time. With this in mind, and not wanting to jeopardize a possible criminal action, the Coast Guard notified the Crimes on the High Seas Branch of the Federal Bureau of Investigation in Boston, Massachusetts. All information was relayed to the FBI, as was the specific statute (18 USC 2191) which appeared to apply.

The FBI's investigation uncovered another incident involving the same Master which had not been reported in the telephone complaint. In that incident, which occurred between May 25 and June 3, 1981, a crewman's legs were tied, and he was "dunked" into the icy North Atlantic waters of Georges Bank. Earlier, the crewman had poured salt into the ship's engine to force the Master to return to port. At the trial, the Master admitted to lowering the crewman into the water and confining him to the vessel's head for the rest of the trip. The Master stated he had done so "to teach him a

lesson." The Master also acknowldeged pointing a gun at the crewman.

In pursuing the latest incident, special agents from the Newport FBI Office obtained a search warrant and searched the vessel on July 29, 1981. The agents seized a handgun and padlock which fit the description the seamen gave.

On September 25, the Master was indicted by a federal grand jury for imprisoning the five crewmen. Later, he was indicted for the dunking incident. Testimony in the trial started on March 30, and on April 9, 1982, the Master was convicted. It should be noted that the seamen came forward and testified against the Master. Had they not done so, he might not have been convicted.

According to a June 1982 article in the **National Fisherman**, the "Cruelty to Seaman" statute was last invoked in 1901 against a Captain who flogged his crew. The 1898 law reads, " Whoever, being the master or officer of a vessel of the United States, on the high seas, or on any waters within the admiralty and maritime jurisdiction of the United States, flogs, beats, wounds, or without justifiable cause, imprisons any of the crew of such vessel, or withholds from them suitable food and nourishment, or inflicts upon them corporal or other cruel or unusual punishment, shall be fined not more than $1,000 or imprisoned not more than five years, or both."

Since this Master was not required to hold Coast Guard licenses on his vessel, there was no action the Coast Guard could take to remove his certification. However, by working closely with another federal agency in bringing criminal charges against the Master, the Coast Guard demonstrated its commitment to the safety and welfare of all seamen. ↕

From the Editor

Mr. Ron Bohn, Hazardous Materials Coordinator for the National Cargo Bureau, Inc., in New York, recently sent me some interesting correspondence on the definitions of "flammable" and "inflammable." Mr. Bohn asked Merriam-Webster, Inc., publisher of dictionaries and reference books, to research the rationale behind the use of each word. Following are excerpts of the letters:

Gentlemen:

Of specific interest to us is the U.S. Hazardous Materials Transportation Regulations use of "flammable," as opposed to the International Dangerous Goods Code use of "inflammable." The terms are intended as synonyms...There is a tendency to assume they are opposites (as in "compatible" and "incompatible"), thus causing continued confusion....

Dear Mr. Bohn:

I think the reason that you find inflammable in the International Dangerous Goods Code is that the code follows British rather than American usage. Flammable has been the preferred term in the United States since 1924, when the National Fire Protection Association officially adopted it.

In Great Britain, however, inflammable has continued to be the popular term, although flammable is occasionally used. A recent (1984) British usage book comments that flammable is gaining in British use; if this is indeed the case, the publishers of the International Code may well be willing to switch to flammable.

We hope you find this information helpful.

Sincerely yours,

E. W. Gilman
Merriam-Webster, Inc.

Ship and Equipment Design

How well are mariners' requirements taken into account when ships are designed and fitted out? On the premise that feedback from professionals could forestall future problems, a London-based organization solicited the views of its seafaring members.

Part IX
Communication

Compiled by E.J. Riley
from responses to the
Nautical Institute questionnaire

1. Aerials

Problem: Frequently aerials are found to be scattered over bridge wings and monkey island. Cage-type aerials have been found to be unsafe.

Remedy. There should be a specific site for aerials, e.g., on the radar mast. Avoid the use of cage-type aerials.

2. Documentation

Problem: Excessive paperwork results from the numerous regulations, port entry, and customs forms. Different countries require different forms, and there are frequent delays caused by too much paperwork.

Remedy. Standardized forms and regulations would be helpful. Design a reliable electronic storage and retrieval system to cope with the endless flow of information, advice, and legislation received from various sources. The system should be easy to operate, economical and robust, capable of manual input by wire or tape, and thoroughly tested for the marine environment.

3. Mooring operations

Problem: Communications are poor. Talkback systems are dangerously sited with regard to mooring operations and frequently inaudible over noise of machinery. Walkie-talkies frequently break down; fore and aft, there is no direct communication with each other. There is poor bridge-to-tug and shore communications.

Remedy: Talkbacks should be sited at the after end of the fo'c'sle head and forward end of the poop deck, easily accessible and with an unobscured view of the entire mooring operation. They should be easily audible above mooring operations. There should be capability for direct fore-and-aft communication. Walkie-talkies ought to be of a more robust design.

4. Personal communication

Problem: Engine room, cargo holds, void spaces, double bottoms, and areas of main and poop deck are frequently without any form of communication.

Personnel are frequently working alone in these areas and therefore totally out of contact for long periods.

Remedy. For areas where telephone communication is impractical, personal radio/bleepers suitably safe for all areas should be designed for all personnel. A simple radio transmitter/transceiver built into breathing apparatus masks for communication between personnel would be desirable.

5. Photocopier

Problem: There is frequent repetition of forms and faster turnarounds result in lack of time for use of shore-side facilities for copying.

Remedy. A photocopier designed for use on board by all departments should be situated in a suitable location, e.g., the ship's office. It should be robust and thoroughly tested for the marine environment.

6. Public address

Problem: The public address system is frequently designed to be heard in the accommodation only. It can only be operated from the wheelhouse and is inaudible when in the shower or washrooms.

Remedy. Public address system should be capable of operation from each deck, and be audible throughout the entire vessel — on deck, etc.

7. Satellite

Problem: Communications should be made via satellite communication with due regard to susceptibility of "blackouts."

Remedy. SatCom method of communication for all vessels, however, there should be reliable terrestrial equipment designed for use as sole method of communication in the event of a satellite failure.

8. Signal halyards

Problem: Signal halyards frequently foul the various radio and navigational aerials and equipment.

Remedy. Site halyards further outboard, away from obstruction of the various aerials and scanners.

9. Telephone

Problem: Too many parts of the ship are totally out of communication (see earlier comments). Not all cabins have telephones. Telephones are not robust enough for the marine environment. Telephone bell is too loud in cabins, and it frequently can be heard in adjoining cabins. This can be a problem for those on a different watch.

Remedy. All cabins, recreational areas, and all suitable areas on vessel — mast houses, under-deck passageways — should have reliable telephone links. Telephones should be designed for the marine environment, and be easily and simply repairable. The telephone bells should be loud enough to be heard over machinery; in cabins and adjoining rooms, the bell ought to be heard within the cabin only. Master's cabin and

wheelhouse should have a direct link with over-ride facility. Numbering of telephones ought to be designed for quick and easy reference —standard throughout ship's company. A directory of all telephone numbers should be mounted adjacent to each telephone.

10. Television antennae

Problem: Multidirectional television antennae give bad reception in port due to backscatter fromm cranes and industrial installations.

Remedy. Units should be designed with the ability to switch to low gain.

11. Telex

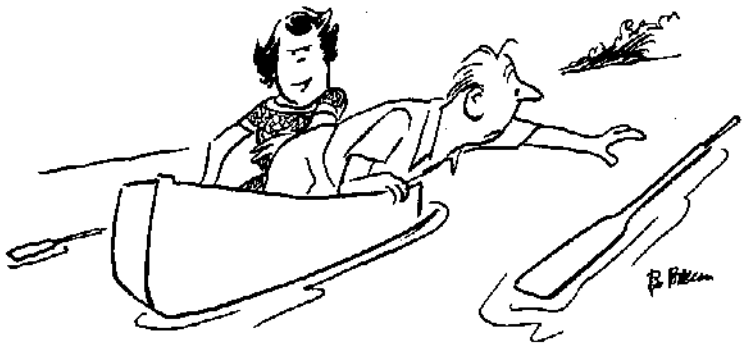
Problem: On some vessels, telex is fitted only with a radio link and therefore is of little value.

Remedy. Telex is overall efficient and time-saving, allowing easier communication with company ashore; it should be designed for full use.

12. VHF/UHF/MF

Problem: Siting of equipment allows room for improvement. Frequently there is only one handset on the bridge, sited in the wheelhouse. Reserve/back-up equipment often only radiates on MF, cannot do so on HF. Should the generator fail, the ship is unable to communicate over range of 400 miles.

Remedy. It has been found on some vessels that UHF reception is greatly improved if base set is sited in the wheelhouse. Remote set is required to be sited close to conning position in the wheelhouse, with additional repeater sets on each bridge wing, both with external listening facilities for use when required. ‡



"Tell me again about when you were in the Coast Guard."

MARAD Report on Inland Barge and Towing Industry

The Maritime Administration has released a three-volume research report entitled, "A Guide to Strategic Planning for the Inland Barge and Towing Industry."

The report provides a step-by-step approach to strategic planning which can be put into practice by individual companies in the inland barge industry. Its objective is to enable them to better cope with the uncertainties and problems which the industry is currently facing, as well as future problems.

The report contains financial, barge, and cargo statistics not previously available in a single document and provides cargo forecasts for major commodities (i.e., major agriculture products, coal and coke, crude oil and petroleum products) for the Mississippi River system and the Gulf Intracoastal Waterway.

Copies are available from the Defense Technical Information Center, Bldg. 5, Cameron Station, Alexandria, VA 22314, and the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

Keynotes

Final Rule

CGD 84-039 — Radioactive Materials — (March 4)

This rulemaking revises the regulations in 49 CFR, Parts 170 to 178 redefining the terms "cargo of particular hazard" and "certain dangerous cargo."

CGD 81-052 — Compliance Procedures for Self-Propelled Foreign Flag Vessels Carrying Hazardous Liquids and Bulk Liquified Gases — (March 5)

This amendment revises the rules for self-propelled foreign flag vessels carrying bulk hazardous liquids and liquified gases. It simplifies and standardizes examination and certification procedures, reduces information required by the Coast Guard from vessel owners.

CGD 81-079 — Marine Engineering Regulations for Merchant Vessels; Acceptance of ASME S, E, A, and H Symbol Stamps for Power and Heating Boilers — (March 8)

These regulations replace the current Coast Guard requirements for plan approved and shop inspection of boilers with requirements that boilers be stamped in accordance with the American Society of Merchant Engineer's Boiler and Pressure Vessel Code.

CGD 85-009 — Written Warnings by Coast Guard Boarding Officers for Violation of 33 CFR 88.05 — (March 18)

This regulation grants authority for the issuance of a written warning given by Coast Guard Boarding Officers to operators of vessels 12 meters or more in length for failure to carry, on board, a copy of the Inland Navigation Rules (33 CFR 88.05).

CGD 82-28 — Segregated Ballast, Dedicated Clean Ballast and Crude Oil Washing on Tankships of 20,000 DWT or more but less than 40,000 DWT Carrying Oil in Bulk — (March 22)

This proposal amends the Coast Guard's rules for Protection of the Marine Environment Relating to Tank Vessels Carrying Oil in Bulk. The rules are applicable to U.S. and foreign tankships entering the navigable waters of the United States. The rules will reduce discharges of oil from existing tankships of 20,000 to 40,000 deadweight tons (DWT) by requiring the installation of segregated ballast tanks, dedicated clean ballast tanks, or crude oil washing systems.

Advance Notice of Proposed Rulemaking

CGD 84-098	Revision of the Regulations on Outer Continental Shelf Activities	(March 7)

This notice solicits public input concerning a revision of the Coast Guard regulations on Outer Continental Shelf (OCS) Activities. Comments must be received on or before June 5, 1985.

CGD 85-002	Safe Powering Standard; Classification of Sport Boats	(March 21)

The intent of this amendment to Subpart D of Part 183 of Title 33 CFR is to give certain small outboard powered runabouts, which can clearly operate safely with more horsepower than they currently rate under the Coast Guard Safe Powering Standard, more reasonable maximum horsepower capacities.

CGD 83-071a	Mobile Offshore Drilling Unit Requirements	(March 25)

This proposed revision of the requirements for Mobile Offshore Drilling Units (MODU) would align the regulations more closely with the International Maritime Organization (IMO) MODU Code, incorporate applicable international agreements, implement legislation, and address problems identified by casualty investigations and public input. The Coast Guard invites the public to comment on this proposal. The comment period ends June 24, 1985.

CGD 84-088	Certification of Seamen	(February 4)

The Coast Guard is calling for comments on the proposed total revision of 46 CFR Part 12, Certification of Seamen. This proposal contemplates additional requirements, such as physical examinations, mandatory training, and drug/alcohol screening for initial certification and retention of Merchant Mariners Documents. In addition, this revision will incorporate changes in the statutes, clarify policy and procedures, and improve the overall readability of the regulations. Comments should be submitted on or before June 1, 1985.

Proposed Rule

CGD 77-069	Proposed Safety Standards for Existing Self-Propelled Vessels Carrying Bulk Liquified Gases.	(March 14)

This proposed rule would revise U.S. regulations for existing gas ships carrying bulk liquified gases in U.S. waters by adjusting certain standards of the IMO Existing Gas Ship Code that are not currently in U.S. regulations. Comments must be submitted on or before June 12, 1985.

Notice of Proposed Rulemaking

CGD 83-070 — Revision of Tonnage Measurement Regulations — (March 18)

This proposal is intended to clarify, consolidate, and reorganize simplified tonnage measurement regulations. It does not change the present substantive law nor affect any vessel presently documented under the laws of the United States. This proposal enables the public to better understand tonnage measurement requirements and saves time and money while preserving the character of the present system. Comments must be received on or before May 17, 1985.

Notice

CGD 85-016 — Towing Safety Advisory Committee; Request for Applicants for Appointment to Membership — (March 28)

Requests for application should be received no later than May 1, 1985 and must be completed and returned to the Coast Guard no later than June 1, 1985.

Requests for copies of NPRMs should be directed to the Marine Safety Council. The address is Commandant (G-CMC), U.S. Coast Guard, 2100 Second Street, SW, Washington, DC 20593; telephone (202) 426-1477. The office, Room 2110 at the above address, is open between the hours of 9:00 a.m. and 4:00 p.m. Monday through Friday. Comments are available for inspection or copying during those hours.

Cyclohexane

There are many substances which are related in their production to crude oil. Among those are gasoline, kerosene, and this month's chemical, cyclohexane. Like most of the crude oil products that come to mind, cyclohexane is fractioned from crude oil, meaning it is a "by-product" from crude oil refinement. Cyclohexane may also be synthetically prepared from benzene or cyclopentane.

Even though you won't see this chemical sold in stores, you come in contact with it nearly every day. Cyclohexane is used as a solvent for resins, fats, waxes, rubber, adhesives, paint thinner, degreasers, perfume, and as an intermediate substance in the production of nylon 66. When used as a solvent or diluent (diluting agent), cyclohexane accelerated the penetration of local anesthetics through the skin of certain animals. However, in some cases cyclohexane may also promote absorption of toxic agents.

Cyclohexane is a clear, colorless, volatile, flammable, non-toxic liquid. Its vapor is considered flammable when in the range of 1.3 percent to 8 percent concentration levels and will ignite at temperatures as low as -20°C (-4°F). If a fire occurs, firefighters should be careful not to inhale the vapor. A cyclohexane fire can be extinguished with dry chemicals, foam, or carbon dioxide.

Although there are no long-lasting effects from recurring cyclohexane exposure, persons who regularly come into contact with the chemical should take safety precautions. Cyclohexane is generally a depressant and may cause dizziness, nausea, and even unconsciousness. It is a lipid solvent (lipids include organic fat) and can therefore dry out the skin with repeated contact. The vapor may be irritating to the skin, but inhalation is the primary pathway for contamination. Inhalation experiments with laboratory animals showed that high concentrations of the chemical are required for toxicity; however, once toxic levels were reached, there was very little difference in concentrations causing narcosis (extreme stupor), loss of reflexes, and death.

Cyclohexane differs from substances such as benzene in that it causes no biological changes to the body. It is generally a safe solvent, particularly when handled according to the instructions. If contamination should occur, wash the eyes with water, wash the skin with soap and water, and contact a physician if necessary. You should ensure adequate ventilation when using cyclohexane, and chemical cartridge respirators and rubber gloves may be used if desired.

In general, regulations governing the transportation of cyclohexane are the regulations for flammable liquids. Shipment may be by train, plane, truck, barge, or tankship. The quantity and packaging during shipment may depend on the mode of transportation.

The U.S. Coast Guard regulates cyclohexane as a Grade C flammable liquid in the Code of Federal Regulations, Title 46, Chapter I. The International Maritime Organization considers it a 3.1 class hazard material. Specific regulations may be found in the CFR, Title 49, Chapter I for the Department of Transportation regulations; Title 40, Chapter I for the Environmental Protection Agency regulations; and on page 3027 of the International Maritime Dangerous Goods Code for the IMDG regulations.

Chemical name:	*cyclohexane*
Formula:	C_6H_6
Synonyms:	*Hexahydrobenzene* *Hexamethylene* *Hexanaphthalene*
Physical Properties:	
boiling point:	*80.7°C (177.3 °F)*
freezing point:	*6.6°C (43.8°F)*
vapor pressure:	
25°C (72°F)	*97.6 mm Hg*
20°C (68°F)	*95.0 mm Hg*
Threshold Limit Values (TLV)	
time weighted average:	*300 ppm; 1050 mg/m³*
short term exposure limit:	*375 ppm; 1300 mg/m³*
Flammability Limits in Air	
lower flammability limit:	*1.3% by volume*
upper flammability limit:	*8% by volume*
Combustion Properties	
flash point (c.c.):	*-20°C (-4°F)*
autoignition temperature:	*260°C (500°F)*
Densities	
liquid (water=1):	*.8*
vapor (air=1):	*2.9*
U.N. Number:	*1145*
CHRIS Code:	*CHX*
Cargo compatibility group:	*31 (Paraffin)*

Kirk Johnson was a Third-Class Cadet at the Coast Guard Academy when he wrote this article. It was written under the direction of LCDR Thomas J. Haas for a class on hazardous materials transportation.

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:

ENGINEER

1. A hydrometer measures specific gravity by comparing the

A. density of a substance in water with the density of the same substance in air.
B. differences in weight between water and the liquid measured.
C. mass of the substance measured with the density of the same substance.
D. buoyancy of an object in water with the buoyancy of the same object in the liquid being measured.

Reference: NAVPERS, Principles of Naval Engineering

2. The oil-film pressure produced by a rotating journal is

A. the same as the pressure in the lubricating system.
B. greater than the pressure in the lubricating system.

C. less than the pressure in the lubricating system.
D. highest at the oil groove location.

Reference: Stinson, Diesel Engineering Handbook

3. In a flash evaporator, heated water under pressure is converted into vapor by suddenly

A. increasing its temperature.
B. decreasing its density.
C. increasing its velocity.
D. decreasing its pressure.

Reference: Osbourne, Modern Marine Engineering Manual, Vol. I

4. In a return flow fuel oil atomizer assembly, oil enters the whirling chamber through

A. the outer barrel tube.
B. the sprayer plate drilled passages.
C. tangential slots in the sprayer plate.
D. baffles in the orifice plate.

Reference: Latham, Introduction to Marine Engineering

5. The heat required to raise the temperature of one pound of any particular substance 1^{o} Farenheit is called

A. its specific heat.
B. its latent heat.
C. a British thermal unit.
D. its adiabatic heat.

Reference: Skrotzki, Basic Thermodynamics

DECK

1. "Panting beams" are located in the

A. fore and after peaks.
B. after double bottoms.
C. forward double bottoms.
D. centerline tanks on tankships.

Reference: Baker, Introduction to Steel Shipbuilding, 2nd ed.

2. Which vessel is, by definition, unable to keep out of the way of another vessel?

A. Vessel engaged in fishing
B. Vessel restricted in her ability to maneuver
C. Sailing vessel
D. Vessel towing

Reference: International Rules

3. The terms "cant frame" and "counter" are associated with the vessel's

A. steering engine.
B. cargo hatch.
C. forecastle.
D. stern.

Reference: Baker, Introduction to Steel Shipbuilding, 2nd ed.

4. To obtain correct positions for the blocks when drydocking a vessel, you would consult

A. the table of principal dimensions of the vessel.
B. the trim and stability booklet for the vessel.
C. the ship's docking plan.
D. any of the above.

Reference: Baker, Introduction to Steel Shipbuilding, 2nd ed.

5. Flammable liquid means any liquid which gives off flammable vapors at or below

A. 40^{o}F.
B. 80^{o}F.
C. 110^{o}F.
D. 150^{o}F.

Reference: 46 CFR 30.10-22

ANSWERS

1-A;2-B;3-D;4-C;5-B
DECK
1-D;2-B;3-D;4-C;5-A
ENGINEERING

If you have any questions about "Nautical Queries," please contact Commanding Officer, U.S. Coast Guard Institute (mvp), P.O. Substation 18, Oklahoma City, OK 73169; telephone (405) 686-4417.

Asphyxiations Aboard Fishing Vessels

Lawrence David Glass
Merchant Marine Investigation Division
U.S. Coast Guard

Numerous deaths have occurred aboard fishing vessels due to asphyxiation. An American Medical Association article dated November 14, 1980, entitled, "Deaths from Asphyxiation Among Fishermen" stated, "...Asphyxiation in unventilated fish holds is an underrecognized hazard resulting in 32 deaths of fishermen in United States waters since 1970."

Recently, the United States Coast Guard, Division of Merchant Marine Investigation, Marine Safety Evaluation Branch, analyzed fishing vessel casualties and found asphyxiations to be an ongoing problem. Deaths and injuries can be prevented if the personnel in the fishing industry seriously consider the precautions, warnings, and suggestions discussed in this article. Unventilated areas, especially the holds or wells of fishing vessels, are extremely dangerous to ship personnel, as the following cases illustrate.

Asphyxiation Casualty Case Studies

Case A. Carbon Dioxide; Hydrogen Sulfide

Tragedy struck this fishing vessel on March 4, 1983, when three of the crew were asphyxiated and two were injured. The vessel, near Trinidad at the time of the deaths, had off-loaded its cargo of tuna 4 days earlier at Puerto Rico. Since unloading, the crew had cleaned and de-iced most of the 20 holds while the others were filled with seawater for ballast. One hold, "4S" (S meaning starboard) was filled at Mayaquez with seawater, known to contain a large percentage of organic matter (sewage), in preparation for cleaning the following day.

This tuna fishing vessel has 20 wooden hatch-covered holds, 10 each on the starboard and port sides. It has the capability of storing 1,700 short tons of fish. The offending hold, 4S, can store 83 short tons, or 3,320 cubic feet. It measures 14' x 16' and is 17.5' deep. During unloading, watertight doors connecting the holds can be opened for ventilation.

The holds are cleaned with seawater which occasionally is mixed with a detergent. The fish pieces and the ice accumulation must be physically removed by deckhands or seamen. This process had been completed scores of times by the vessel's crew without incident, which may have led to a false sense of security.

Between 14 to 18 inches of brine was left in the 4S hold after the crew pumped it out. Normally, the remaining dirty water would be drained into the bilge for evacuation by the bilge pumps, but it was clear that the drain in the 4S hold was clogged. To open the drain, the chief engineer ran a wire up the drain from below while a crew member attempted to clean the drain from inside the hold.

The first seaman to enter the hold immediately passed out. His brother-in-law and three other seamen tried successively to rescue their unconscious shipmates, but each man succumbed to something in the hold. A crew member inexperienced in the use of self-

contained air masks tried to use one while attempting to reach the bodies in the hold. As the crewman descended, the waist strap on the air mask unfastened, and the mask fell off. The rescuer immediately returned to the deck. The crew used portable lighting to locate the victims and attempted to revive them by spraying their bodies with water. Two of the victims revived enough to don lifelines thrown from the deck. Although the crewmen were consciouness when rescued, they slipped into a coma after a few moments. Both were hospitalized with bronchiopulmonary infections which lasted several months. Their symptoms included coughing, dizziness, headache, and acute fatigue.

The three other crew members were not so fortunate. The vessel was pitching, and they most certainly spent some of the 15 to 25 minutes under the rancid water, ensuring their deaths.

A crewman using a hose-fed diving mask was finally able to extricate the bodies.

Although the Trinidad authorities concluded that the victims died from inhalation of toxic gas emitted by rotting fish, no samples of the 4S hold's brine or atmosphere were taken for analysis. The casualties were probably caused primarly by carbon dioxide along with hydrogen sulfide.

After the bodies had been removed, the ship's captain, at the direction of the vessel's owner, ordered that seawater and bomite be circulated all night in the 4S hold. When the hold was safe to enter, crewmen removed **20 gallons** of fish waste.

Conclusions

1. The crew on this fishing vessel had not been warned about or trained to deal with the hazards of entering or working in an unventilated space. They had no knowledge of prior fishing vessel asphyxiation casualties. The Assistant Engineer was literally saved by his memory as he started to enter the hold. He had been studying for the written exam for the Chief Engineer's license on Uninspected Motor Vessels and suddenly remembered the material on hazardous atmospheres discussed in **The Modern Marine Engineer's Manual.** He left the hold before breathing any of the toxic gas.

2. The crew knew little or nothing about the hazards of gases in confined areas. They did not know that toxic gases given off by decomposing fish and organic matter could affect the oxygen in the air.

3. The crew had no knowledge of the location and operation of rescue apparatus aboard. An emergency locker on the second deck contained a resusitation kit with oxygen which was not located until days after the tragedy.

Case B. Hydrogen Sulfide; Carbon Monoxide

On January 14, 1982, this fishing vessel lost one of its crew to asphyxiation. After opening a hold which had been sealed for 12 hours, the ship's Master requested a 17-year-old seaman to enter the hold. He was directed to chop some of the ice away from the shrimp which had been in the hold for less than a week. The Master observed the boy chopping at a particularly large hunk of ice and then yelled that he was going forward for a couple of minutes. When the Master returned, the seaman was lying on the hold deck with the large piece of ice on top of him. The boy was not breathing. The Master immediately pulled the teenager on deck, but he was already dead. Although it seemed obvious that the boy had died from being crushed or traumatized by the ice boulder, the coroner ruled that pulmonary edema resulting from exposure to hydrogen sulfide gas (H_2S) was the cause of death.

Case C. Freon

On May 27, 1982, a crewman of this fishing vessel entered a hold to pack ice and accidentally contaminated the area with freon after puncturing a refrigeration tube. He left

the hold, secured the refrigeration system, and later returned without telling anyone, either to fix the leak or to pack fish. He did not ventilate the hold first. The freon leak was disastrous to anyone who entered without a portable supply of oxygen. The crew accidently found the deceased victim and were fortunate that they, too, did not succumb to the gas during their rescue attempt.

Cases D and E. Ammonia; Carbon Monoxide

This ship, an uninspected fish processor, has the dubious distinction of claiming two casualties.

This first casualty resulted from exposure to ammonia gas on February 9, 1983. Luckily, it was not a fatality. An employee entered the boiler room hunting for a pair of boots. The room had an ammonia leak, and the employee passed out after inhaling the fumes. Quick thinking on the part of the crew, who quickly pulled him from the boiler room and rushed him to the deck for fresh air, surely prevented this man's death.

The second casualty on this ship occurred while in drydock on January 6, 1983. To prepare for a vessel inspection, a crewman was pumping out a water tank with a gasoline pump. Even though the crewman had performed the job many times before, this time he started the pump without opening a porthole or using a fan. About an hour later, he was found dead, a bluish cast to his skin. The cause of death was exposure to carbon monoxide.

Case F. Carbon Monoxide

On September 4, 1983, this fishing boat was the scene of a breaking and entering and a multiple fatality. The vessel was secured in home port while the Master and crew went ashore. Two inebriated adult males boarded the boat and started the engine, presumably to get warm. They soon fell into a drunken sleep. The next morning, the Captain unlocked his boat and discovered a stranger sitting on his cot. He angrily touched the man's shoulder, and when the man fell flat on his face, the Captain ran off his boat screaming for help. When he returned with the authorities, they found the second body on the floor. The intruders had fallen asleep in a tightly secured, unventilated area. Again, carbon monoxide poisoning was the cause of death.

Toxic Gases Responsible for Asphyxiations Aboard Fishing Vessels

There are many dangers aboard fishing vessels, but toxic substances should be given special emphasis since they have claimed the lives of so many fishermen. Some gases are deadly in their own right; others react upon the oxygen content in the air. Still, other gases are heavier than air and thus displace the fresh air at the bottom of an unventilated space. Let's take a closer look at the toxic gases responsible for the casualties in the cases discussed earlier.

Hydrogen sulfide (H_2S) is a very toxic, colorless, poisonous gas with a characteristic rotten-egg odor. Oddly, in large concentrations the gas quickly desensitizes the nostrils and cannot be smelled. Many people are congenitally unable to smell the odor. H_2S is found in many mineral waters and in putrefying matter (e.g., decaying fish and sewage). Previous casualties indicate that a range of 0.09 mg/dl to 0.38 mg/dl of H_2S in the blood is fatal. H_2S inhibits the ability of the body's cells to absorb oxygen. It may penetrate the lungs and cause hemorrhagic pulmonary edema. H_2S can also cause immediate coma, convulsions, and death from respiratory failure. Fortunate survivors complain of headache, dizziness, excitement, nausea, and diarrhea.

Carbon dioxide (CO_2) is a heavy, colorless, odorless, noncombustible gas which is produced by normal exhalation and by the decay or combusition of organic matter. CO_2 is a major problem to the fishing industry since the gas begins to form shortly after the fish die. CO_2

is a simple asphyxiant. When 10 percent of the air volume contains CO_2, unconsciousness and death can result from oxygen deficiency. This gas is extremely dangerous to cardiovasuclar and pulmonary disease victims. Carbon dioxide is heavier than air; thus, concentrations of CO_2 in a hold or other unventilated area will be greatest at the bottom or deck of the well than at the top.

Carbon monoxide (CO) is highly toxic to human beings. This gas is colorless, odorless, tasteless, and can kill quickly in a closed space. It is produced by the incomplete combustion of carbon, most commonly from gasoline or diesel engines. CO binds with hemoglobin to form carboxyhemoglobin, and this substance thwarts the blood's oxygen-carrying ability. Symptoms of exposure are headache, dizziness, drowsiness, nausea, vomiting, collapse, coma, and death.

Methane (CH_4) is a colorless, odorless, flammable, gaseous hydrocarbon. Although methane is not featured in the previous casualties, it is a highly toxic gas which, like hydrogen sulfide, is produced by decomposing organic matter. As a simple asphyxiant, methane can kill in large concentrations, such as in an unventilated fishing boat's hold. Lighting a cigarette in a hold filled with methane could blow a vessel apart.

Freon (a trademark name for a series of flurocarbon products) is widely used as a refrigerant and a propellant in aerosol cans. It is not commonly known that freon can displace fresh air and become lethal in a closed space. It is a nonflammable (gaseous or liquid) fluorinated hydrocarbon. Proper maintenance to safeguard against freon leaks can prevent most serious accidents.

Ammonia (NH_3) is a pungent, colorless, gaseous, alkaline compund of nitrogen and hydrogen. It is water soluble and can be condensed to a liquid by pressure and cold temperatures. It is irritating to the eyes, nose, and moist skin. NH_3 can produce headache, excessive salivation, burning in the throat, anosmia (loss of the ability to smell), nausea, vomiting, and substernal pain. If exposure is extensive or prolonged, severe irritation of the respiratory tract can result in cough, glotal edema (a type of swelling in the throat), bronchospasm, pulmonary edema, respiratiory arrest, and death. Survivors of severe exposure often suffer from bronchitis and pneumonia. Since ammonia is easily noticed by its obnoxious odor, a leak can be easily detected and repaired before a tragedy occurs. However, ammonia can be deadly within a short time and should not be taken lightly just because it is easy to identify.

Suggestions, Precautions, and Recommendations

1. Before anyone is permitted to enter a hold or any space that has been closed for an extended period, the following precautions shoud be taken:
   a. Ventilate the compartment as much as possible by opening all accesses (if it is safe to do so) and by using fans. If flammable gases, especially methane, may be present, use only the mechanical fans of the explosion-proof type.
   b. Test the compartment for oxygen and toxic gases using atmospheric testing devices specifically designed for that purpose.
   c. Always use the buddy system. Never enter a hold without constant communication with someone above.
2. Fish holds should be cleaned as soon as possible after off-loading. Attempt to use clean seawater. Do not use seawater known to contain large percentages of waste or sewage.
3. Be particularly cautious when using a gasoline or diesel engine in any internal space. Always vent the exhaust to the outside of the vessel. Regularly inspect the exhaust piping and ducting for leaks.

4. Inspect cooling systems for leaks on a frequent basis. Before working in a compartment suspected of a freon or ammonia leak, ensure that the area is well ventilated.
5. Inspect safety equipment periodically and maintain it in good working order. Conduct regular training programs for every crew member covering proven dangers aboard fishing vessels. Ensure the crew's familiarity with the use and location of rescue apparatus. To avert possible tragedy, conduct regular drills simulating actual emergencies to sharpen skills. ‡

The National Safety Council

Safety and Health Information Sheet

Informing the Pilot

When vessels enter or depart port areas, the safe navigation of the vessel is normally entrusted to a pilot. The Master still maintains the ultimate responsibility, but the pilot is normally better informed of local conditions (tide and current) and navigational aids. To better ensure the safety of the vessel, it is suggested that certain important vessel characteristics and information be posted in the wheelhouse. In addition, a card with such information can be given to the pilot for him to carry from wing to wing, as necesary.

The suggested information to be supplied to the pilot is as follows:

1. Length (feet and meters)
2. Breadth (feet and meters)
3. Draft (feet and meters)
4. Call letters
5. Official number
6. Type of propulsion
7. Single or twin screw
8. Full speed ahead (knots and RPMs)
9. Half speed ahead (knots and RPMs)
10. Slow speed ahead (knots and RPMs)
11. Astern power
12. Turning radius at full speed and full rudder
13. Distance from bridge to stem (feet and meters)
14. Distance from bridge to stern (feet and meters)
15. Type of communication with bow (R/T or hand signals)

The wheelhouse placard or the portable pilot's card will aid in the prevention of mistakes due to language difficulty. An additional consideration would be a card in the language of the port for each port serviced. Pilots will appreciate such ready information, and you should experience safer passages.

U.S. Department
of Transportation

**United States
Coast Guard**

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