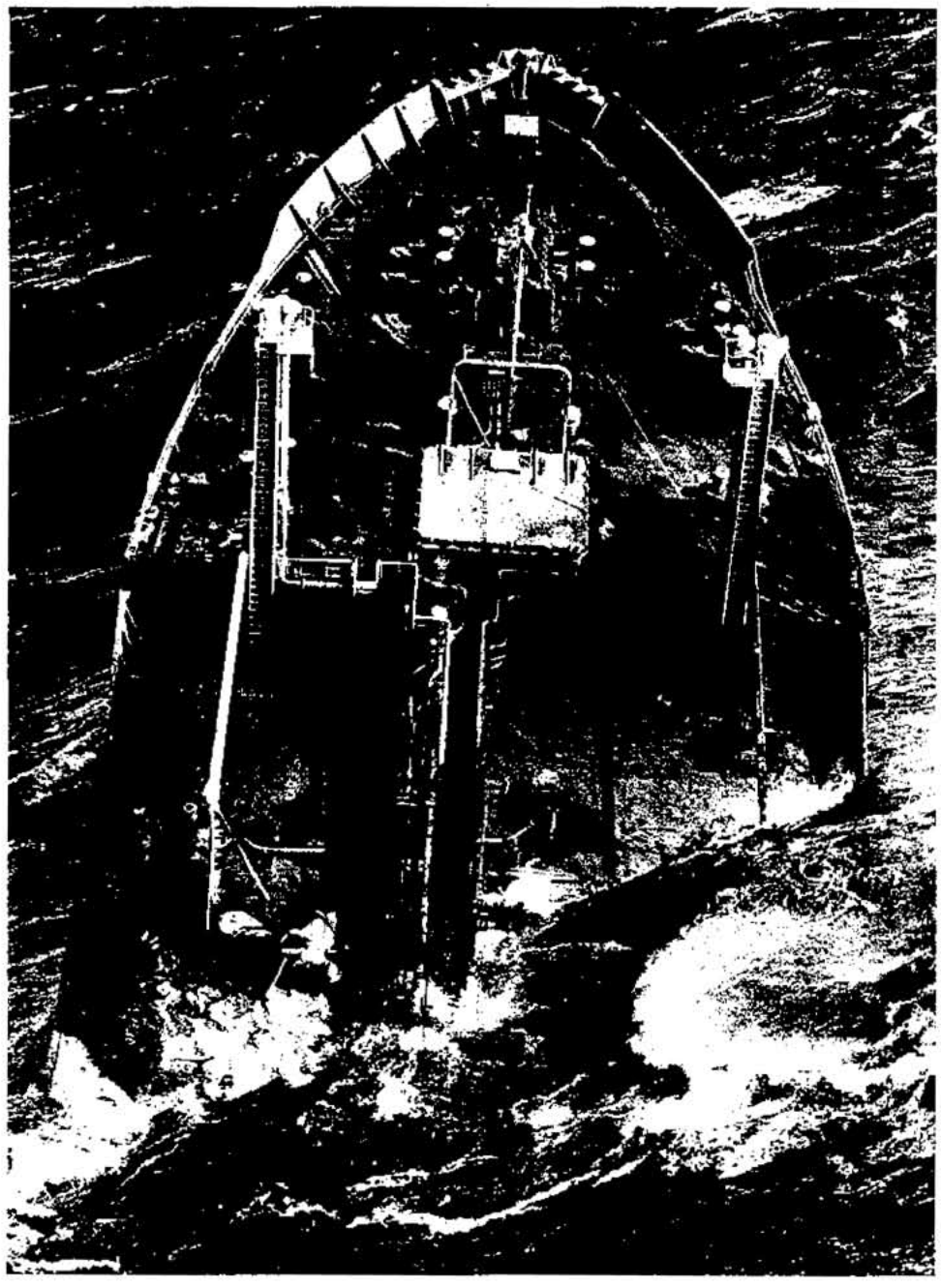
Proceedings

of the Marine Safety Council



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December 1984

Proceedings
of the Marine Safety Council

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Cover

Lt. Clayton Evans continues his discussion of marine safety legislation in "The Making of One of Marine Safety's Most Important Laws--Part II, The Amending Port and Tanker Safety Act." The article begins on page 268. Cover photo, U.S. Coast Guard.

Graduate Degree in Maritime Management

Maine Maritime Academy will launch a modular graduate program in maritime management beginning in summer 1985. This program, offered during the summer months, is designed to accommodate the needs of seagoing personnel and shoreside supervisory personnel who cannot attend full-year residency programs. Additionally, Academy facilities and outstanding faculty from prestigious graduate schools will be available at this time of the year.

The full master's degree program can be completed over two or three summers. Captain George M. Marshall, Director of the Center of Advanced Maritime Studies of Maine Maritime Academy, considers this management development program to be ideal for persons desiring to advance their careers in the maritime industry.

The entire course of instruction will be delivered in two-course modules of 3½ weeks' duration. Four modules are scheduled for each of the next 3 years during the summer months. The candidate successfully completing this program will be eligible for a Master of Science degree in Maritime Management.

A brochure describing the program is available on request by calling or writing Mrs. Doris Richardson, Executive Secretary, CAMS, Maine Martime Academy, Castine, Maine 04420, tel.: (207) 326-4311, extension 211. *

Tanker Casualty Rate Second Lowest Since 1968

The tanker casualty rate for 1983 was the second lowest since 1968, according to a report prepared by the Steering Group on Casualty Statistics of the Maritime Safety Committee, IMO's senior technical body.

Serious casualties to oil/chemical tankers, 1968–1983

Year	Tankers at risk	Serious casualty rate per 100 tankers
1968	3,071	2.54
1969	3,126	2.37
1970	3,169	1.89
1971	3,260	1.96
1972	3,300	2.27
1973	3,361	1.96
1974	3,490	1.89
1975	3,659	2.41
1976	3,725	2.60
1977	3,593	2.39
1978	3,440	2.44
1979	3,346	3.20
1980	3,362	2.14
1981	3,274	2.84
1982	3,215	1.84
1983	3,100	1.87
1968–83	**Total: 53,491**	**Average: 2.29**

The survey of 3,100 seagoing tankers of 6,000 tons and above shows that 1.87 in every 100 were involved in a serious casualty during the year. This is only marginally above the lowest rate recorded since 1968, the year 1982, in which the serious casualty rate fell to 1.84 percent. The average annual rate over the whole period is 2.29 percent.

The report, based on information provided by Lloyd's Register of Shipping, defines "serious casualties" as fires, explosions, collisions, grounding, contact, heavy weather or ice damage, hull cracking or suspected hull defects rendering the ship unseaworthy, loss of life, pollution (regardless of quantity), a breakdown necessitating assistance, or a total loss. (Taken from IMO News, No. 3, 1984, p. 3.) *

The Making of One of Marine Safety's Most Important Laws -- Part II

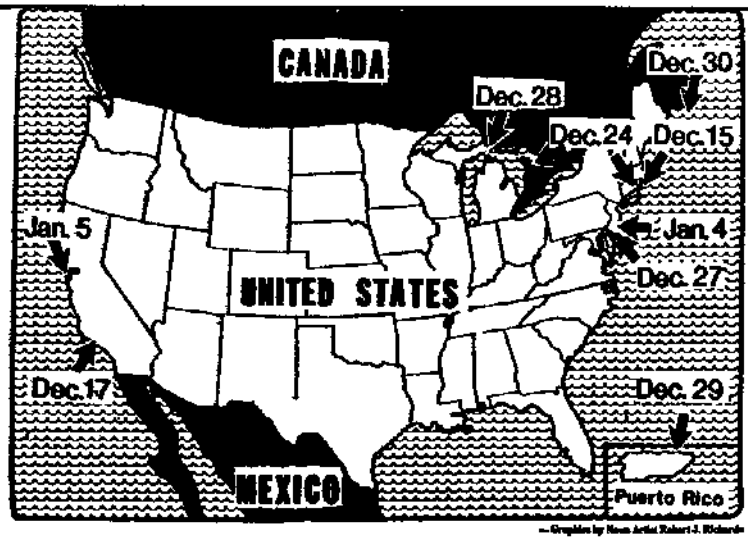
The Amending Port and Tanker Safety Act

by Lt. Clayton W. Evans
Program Development Branch
Port and Environmental Safety Division
U.S. Coast Guard

In our last issue, Part I of this article discussed the events that led up to the Ports and Waterways Safety Act of 1972.

The Incredible Rash of Accidents

In a 3-week period between mid-December 1976 and early January 1977, an unprecedented series of tankship casualties in U.S. and other waters drew national and international attention to the need for stronger marine safety legislation. During this period, at least nine tankers spilled or threatened to spill significant quantities of oil, and the causes ranged from explosion to grounding. An article taken from the Detroit News is representative of accounts that appeared in newspapers throughout the country.



—Graphics by News Artist Robert J. Richards

Since Dec. 15, 10 oil tankers have suffered mishaps near U.S. and Puerto Rico

3-week saga

Tanker mishaps fouling 2 oceans

By United Press International

The three-week saga of oil tanker mishaps stretched from the Atlantic to the Pacific.

The tanker Grand Zenith, carrying 32 crewmen and eight million gallons of industrial fuel, apparently has vanished without a trace beneath the North Atlantic.

"There's one wild card in a thousand that says that ship is still afloat," Coast Guard Capt. Bernard Hoyland said yesterday even before planes completed a 150,000-square-mile ocean sweep.

In California, an oil spill stretched along six miles of San Francisco Bay after about 2,100 gallons of petroleum spilled during loading of the U.S.-registered tanker Austin at Shell Oil facilities in Martinez.

A chronological listing of tanker mishaps since Dec. 15:

Dec. 15 — The Liberian-registered tanker Argo Merchant ran aground 27 miles southeast of Nantucket Island and broke up six days later, spilling 7.6 million gallons of oil into the Atlantic.

Dec. 17 — The 810-foot Liberian-registered tanker Sansinena exploded in Los Angeles harbor, leaving nine dead and 50 injured.

Dec. 24 — The Canadian ship Imperial St. Clair ran aground off Parry Sound in Georgian Bay and spilled 42,000 gallons of petroleum products.

Dec. 24 — The Liberian-registered Oswego Peace spilled 2,000 gallons of oil in the Thames River near Groton, Conn.

Dec. 27 — The Liberian-registered Olympic Games ran aground in the Delaware River near Philadelphia, spilling 133,500 gallons of oil and fouling the shorelines of three states.

Dec. 28 — A second Canadian ship, the Imperial Sarnia, ran aground in heavy ice in the St. Marys River near Sault Ste. Marie, blocking river traffic for several hours.

Dec. 29 — The Liberian-registered Daphne ran aground in Guanamillo Bay, Puerto Rico, but spilled no oil.

Dec. 30 — The Panamanian-registered Grand Zenith, carrying a crew of 38 and 8.2 million gallons of oil, radioed it has encountered heavy weather 50 miles south of Cape Sable, Nova Scotia. It hasn't been heard from since.

Jan. 4 — The Liberian-registered tanker Universe Leader ran aground in the Delaware River and was refloated Jan. 5 with no spill reported.

Jan. 5 — The U.S.-registered tanker Austin spilled 2,100 gallons of oil into San Francisco Bay while loading at Martinez, Calif.

Exxon 'accepts' 10% price rise

From UPI and AP Dispatches

Exxon, the world's largest oil company, has accepted a 10 percent increase in the price of oil, Venezuelan Mines Minister Valentin Hernandez said yesterday.

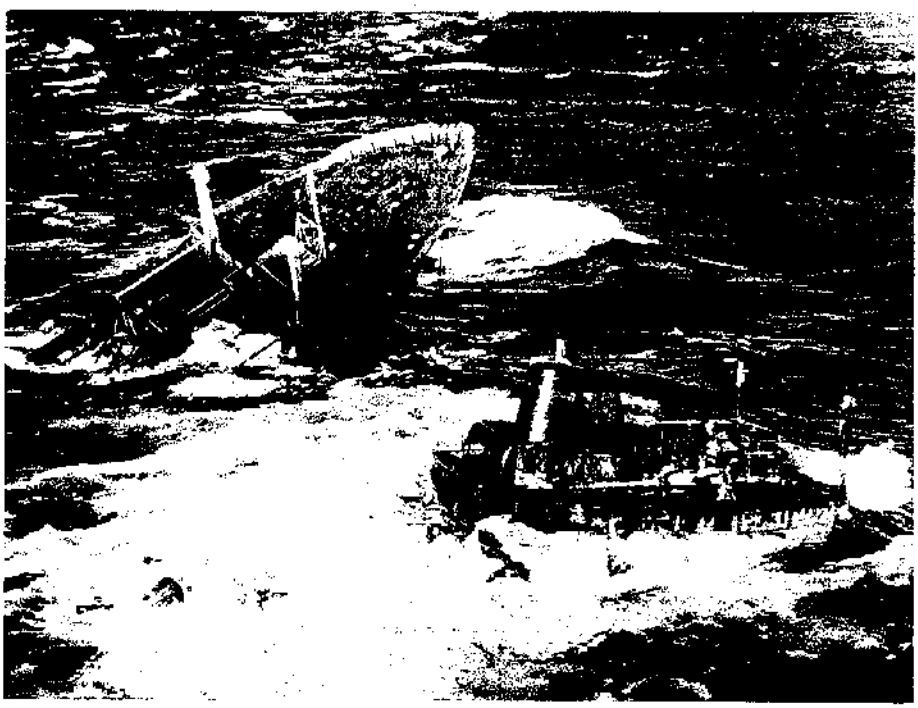
"Exxon has accepted the increase in prices, as well as independent refiners," Hernandez said. "We have had no complaints to the 10 percent price increase so far."

Exxon purchases about 850,000 barrels daily of Venezuelan crude and refined oil under a two-year sales contract with Venezuela's nationalized oil industry.

In Nicosia, Cyprus, oil industry sources said Abu Dhabi will increase oil production, following the lead of Saudi Arabia, in an attempt to undersell other members of the Organization of Petroleum Exporting Countries (OPEC).

The sources said Abu Dhabi had lifted its "production ceiling" of 1.5 million barrels of crude daily and would produce 1.8 to 2 million barrels a day in 1977, up at least 20 percent.

Reprinted with permission of the Detroit News.



The broken halves of the ARGO MERCHANT swirl in a sea of foam before being pulled under. Official photo, U.S. Coast Guard.

Although it was this entire rash of tanker accidents that fostered new marine safety legislation, two incidents, the ARGO MERCHANT grounding and oil spill and the SANSINENA explosion and spill, were the most significant events.

The Grounding of the ARGO MERCHANT

At approximately 7:00 a.m. on December 15, 1976, the tankship ARGO MERCHANT ran aground 28 miles southeast of Nantucket Island in international waters of the Atlantic Ocean. The vessel was of Liberian registry and at the time of the grounding was bound for Salem, Massachusetts, with a cargo of 7.3 million gallons of heavy heating oil. Because the ARGO MERCHANT ran aground in international waters, out of U.S. jurisdiction, the Commandant of the Coast Guard invoked the Intervention on the High Seas Act to mitigate any oil pollution damage.

Extensive efforts to offload the ARGO MERCHANT's cargo and refloat the vessel were unsuccessful. Coast Guard pollution strike teams, called in to assist, tried to ignite the spilled fuel, but this also was unsuccessful. On the morning of December 17, the vessel apparently began spilling oil from ruptured transfer lines and open cargo tank openings. By December 19, an estimated 1.5 million gallons of oil had been discharged. On the morning of December 21, the wind increased to 30 knots and the seas to 8 feet. Without warning, at 8:30 a.m., the ARGO MERCHANT broke in two, and most of the remaining 7.3 million gallons of oil spilled into the ocean. Provisions had been made on Nantucket Island, Martha's Vineyard, and Cape Cod to combat the oil, should it reach shore, but winds blew it out into the Atlantic. On December 22, severe weather conditions made it impossible to continue efforts to offload the ARGO MERCHANT. That afternoon the bow section broke in two. Concentrations of oil were found extending 90 miles east of the tanker, with heavy concentrations up to 12 miles. On January 3, an oil survey flight found oil extending 180 miles southeast from the vessel, with concentrations in some areas 50 miles in diameter. The oil was tracked as long as it remained recognizable.

The ARGO MERCHANT had a previous history of oil pollution violations in Philadelphia, Boston, and Portland, Maine. In August 1975 the vessel was directed by the Coast Guard Captain of the Port, Boston, to depart the port after it had caused a minor pollution incident.

A marine board of investigation was convened by the Government of Liberia to determine the circumstances of the ARGO MER-

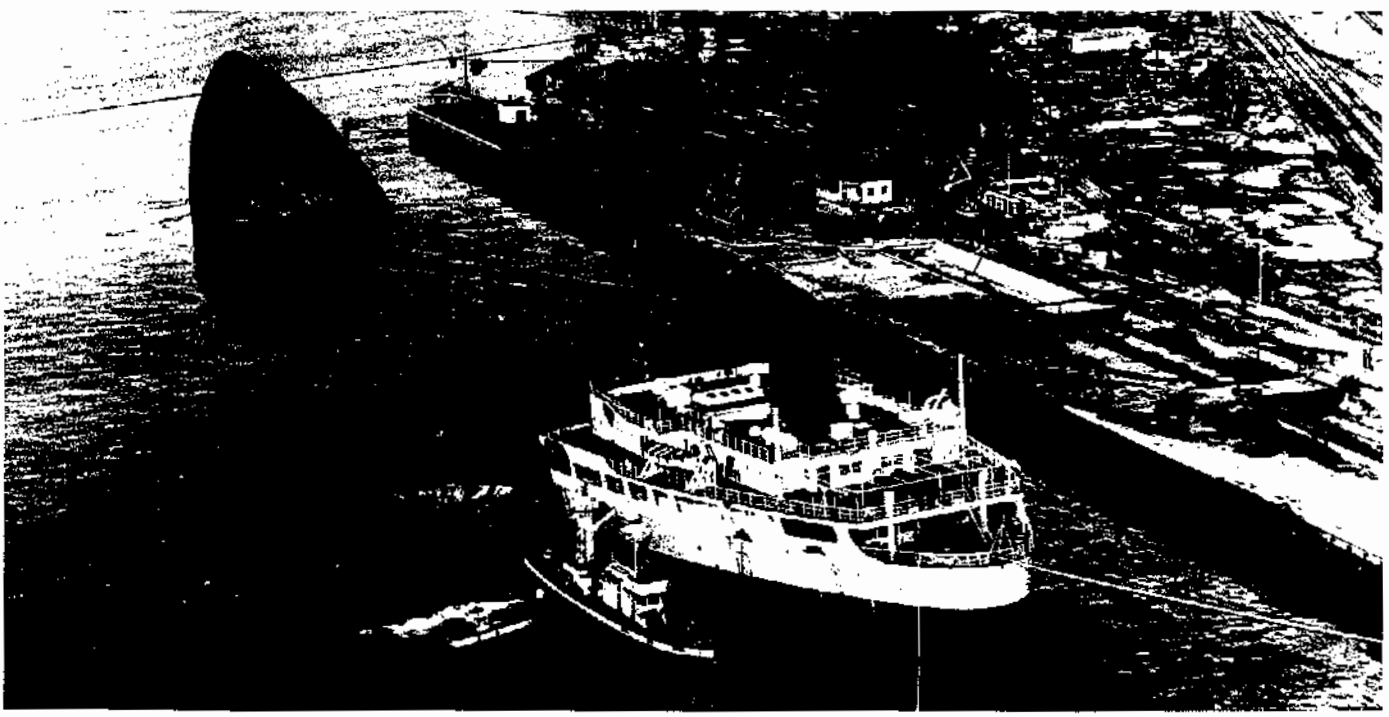
CHANT grounding. The decision of the Commissioner of Maritime Affairs and the Final Report of the Marine Board of Investigation found that the immediate cause of the stranding was faulty navigation:

> *This resulted either from reliance on a malfunctioning gyro compass, or inadequate allowance for the variation of the magnetic compass, or a deliberate intention to follow a course inside (to the west of) Nantucket Light Vessel. The stranding could be a result of a combination of two or more of these factors...*
>
> *Whether the Master intended to sail inside Nantucket Light Vessel or whether he committed a gross error of navigation, there is little to be said in mitigation of his command of this vessel. The stranding was not justified by the weather or by any act beyond the control of the Officers.*

The SANSINENA Explosion

On December 17, 1976, two days after the ARGO MERCHANT ran aground, the Liberian tankship SANSINENA exploded in Los Angeles Harbor, killing 8 persons, injuring 22, and creating approximately $21.6 million damage, strengthening the belief that stronger ports and waterways legislation was necessary.

On December 16, the SANSINENA arrived at the Union Oil Terminal, San Pedro, California, with two types of Indonesian crude oil. The vessel's cargo tanks were emptied and stripped by early evening the next day. When this was completed, ballasting of some cargo tanks began at the same time the vessel was taking on bunker fuel. At about 7:00 p.m. on December 17, the ballasting was approximately half completed. Heavy, still weather conditions had apparently caused a vapor cloud of crude oil fumes, forced out during ballasting, to remain over the deck of the ship. A flash flame started aft of the midship superstructure near



The force of the SANSINENA explosion in Los Angeles Harbor heaved the ship's superstructure 100 feet onto the dock. Eight persons were killed, 22 were injured, and damage was estimated at $21.6 million. Official photo, U.S. Coast Guard.

the cargo mainfold and spread to the No. 10 center tank. A massive explosion erupted amidships.

The force of the explosion broke the 71,000 dead-weight-ton ship in half, pushing the fore and aft sections 150 feet apart and heaving the superstructure 100 feet onto the dock. Flames from the subsequent fire reached 1,000 feet into the air. One witness to the explosion said, "I saw the mushroom forming, and I thought it was an A-bomb. I thought it was the war."

Congress: "The sad fact is...none of this is new."

Hearings before the Senate Committee on Commerce on the series of tanker accidents were conducted on January 11 and 12, 1977. In the opening statement of the hearings, Senator Ernest F. Hollings said:

> *The recent tanker incidents--over 10 since December 15--have demonstrated once again the need for major improvements in the way this nation manages tanker operations.*
>
> *The sad fact about this is, though, is that none of this is new. Back in 1971, I chaired hearings when we were trying to get the Ports and Waterways Safety Act passed. We knew about many of these problems then, but in spite of our desires to do something about them, in spite of the hearing which Senator Magnuson and I chaired in 1975 and the additional hearings last year, we have not been able to gain enough attention to get somthing done. It is regrettable that it has taken so many tanker accidents to gain that attention.*
>
> *If we look at a few of these accidents, we find that they illustrate some of the problems we need to deal with, and which we will seek information about in these hearings.*

The hearings were filled with accounts of the tankship disasters that occurred in December 1976 and January 1977, and throughout, the Coast Guard was criticized for not extending its anti-pollution measures to existing fleets of small oil tankers that were considered to be the most significant source of pollution and other disasters.

The Race To Get Something Done

As a result of the ARGO MERCHANT and SANSINENA disasters and the other tankship accidents, the Secretary of Transportation established a special departmental task force in December 1976 to undertake a thorough review of marine safety regulations and the effectiveness of these regulations to prevent and remove oil spills. The task force reported its findings in January 1977 in an interim report. President Carter shortly afterward convened an interagency task force to review all of the issues associated with tank vessel safety and protection of the marine environment. This second task force review ended with a number of proposals announced by the President to the Congress in a message dated March 17, 1977.

In his message, President Carter announced new minimum construction and equipment standards for tankers. These standards required segregated ballast to reduce oil pollution and inert gas systems to minimize the risk of accidental explosion. Additionally, President Carter gave instructions to improve the international system of tanker inspection, announced an augmented tankship boarding program, directed that licensing and qualification standards for U.S. vessels be raised, and called for the ratification of the International Convention for the Prevention of Pollution from Ships, 1973.

From testimony gathered in the Senate Commerce Committee hearings, and in spite of President Carter's strong initiatives, Commerce Committee Chairman Warren G. Magnuson pressed for action on his proposed Tanker and Vessel safety bill, S. 682. The bill set minimum construction and equipment standards designed to reduce the number of tankship accidents and associated oil spill damage. Both domestic and foreign vessels would be subject to annual safety certifications, and the Secretary of Transportation could prohibit substandard ships from entering U.S. waters. With full support, the

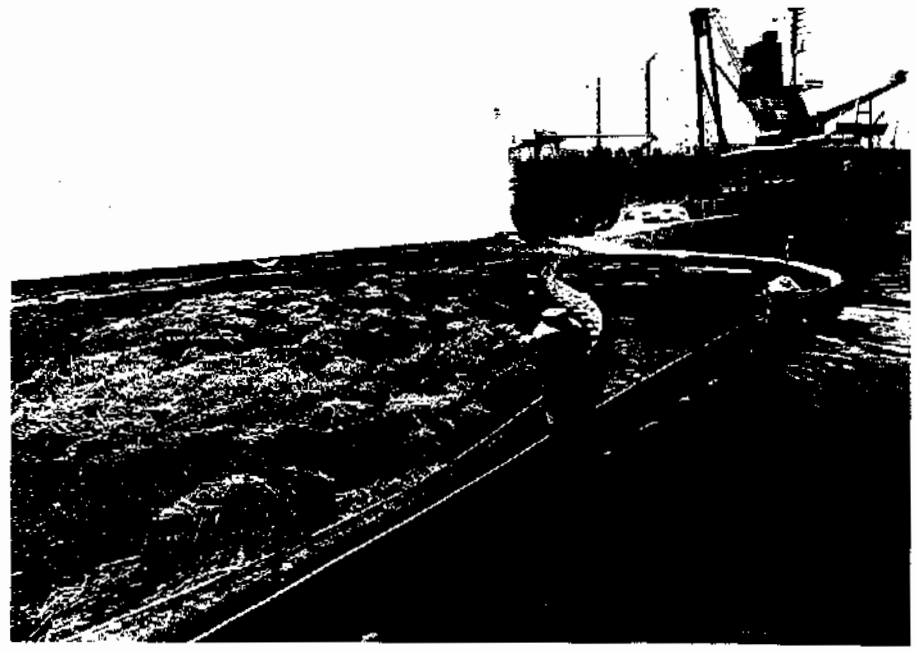
Senate approved S. 682 on May 26, 1977.

The House of Representatives was also busy during this time with similar legislation treating vessel safety and pollution prevention. Early in the 95th Congress, 27 bills dealing with these problems were introduced. The House Subcommittee on Coast Guard and Navigation subsequently consolidated the various bills and proposed new language as an amendment to S. 682. The House Committee on Merchant Marine and Fisheries considered the action of the Subcommittee, but it ordered a clean bill, H.R. 13311, reported to the House. The Senate bill was eventually passed in lieu of the House bill, after amending the language to contain much of the text of the House bill.

In addition to the Magnuson provisions, the Port and Tanker Safety Act of 1978 that amended the Ports and Waterways Safety Act gave stronger vessel traffic control to the Coast Guard. It required the provision of federally licensed pilots where the states had failed to act, and it also required crew members to be certified for handling oil and hazardous materials.

The Ports and Waterways Safety Act, As Amended, Today

Many provisions of the Ports and Waterways Safety Act, as amended, are today effective in reducing the number of tankship accidents. The Navigation Safety Regulations found in 33 CFR 164 have been a primary tool in carrying out this act. The regulations prescribe essential navigation equipment and procedures for safe navigation in U.S. waters. The Coast Guard enforces these regulations through boarding vessels in ports and harbors. This activity is performed in conjunction with other boardings, such as tankship pollution prevention examinations or hazardous materials inspections on cargo vessels.



The Navigation Safety Regulations and Coast Guard enforcement have been successful in reducing the number of catastrophic oil spills. Official photo, U.S. Coast Guard.

The Navigation Safety Regulations and Coast Guard enforcement have been successful in reducing the number of catastrophic oil spills from collisions, rammings, and groundings of tankships. A study of reported oil spills shows that the number of spills from tankship hull ruptures has declined to insignificant levels since the advent of the Navigation Safety Regulations.

Virtually all of the important marine safety laws and their effective regulations arose out of public and congressional reaction to catastrophic marine accidents, and this unfortunate cycle of events is likely to continue. With the fantastic increase in tankship traffic and vessel size came an increased risk of accident. The sad consequences of these accidents apparently could not be foreseen. As Maurice Foley said during the TORREY CANYON oil spill, "This is a problem no country has had to face before." *

Vessels Meeting at the Confluence of Two Rivers

by Warren Ashley Hines

This article was written by Mr. Warren Ashley Hines, a member of the Rules of the Road Advisory Council and of the Mississippi State House of Representatives Mr. Hines, a licensed operator of inland towing vessels, is also a trial attorney whith Henderson, Duke and Dantone in Greenville, Mississippi. He served as staff counsel, U.S. Senate Committee on the Judiciary, Subcommittee on Immigration and Naturalization. Mr. Hines is a member of the American Bar Association, the Mississippi State Bar, the Maritime Law Association of the United States, the Propeller Club, and the New Orleans Mariners Club.

The following statement was adopted by the Rules of the Road Advisory Council (RORAC) during its meeting in Houston, Texas, September 20-21, 1984:

Prior to the passage of the unified Inland Navigation Rules, Pilot Rule 95.07 of the Western River Pilot Rules governed the situation of two vessels meeting at the confluence of two rivers. The Rule stated:

When two steam vessels meet at the confluence of two rivers, the steam vessel which has the other to port shall give the first signal, but in no case shall pilots on steam vessels attempt to pass each other until there has been a thorough understanding as to the side each steam vessel shall take.

When the unified Rules were drafted, Pilot Rule 95.07 was not included because members of the Advisory Committee which helped draft the Rules believed it was not needed. The committee felt that, by using common sense, no one would give a right-of-way through another vessel and that the existing rules would adequately cover the situation. Under the old rules, of course, no right-of-way was given; only a requirement as to which vessel would sound the first signal of its intent. Even then the vessels were not to meet until each vessel understood what the other was to do. However, because of concern expressed by members of the maritime community, we have undertaken to study this meeting situation in light of the unified Rules.

To clarify a given situation when vessels come together at the same time in a channel where two streams merge, the Rules of the Road Advisory Council believes that, in addition to the General Steering and Sailing Rules, the following rules specifically apply:

Rule 2. Responsibility. The responsibility rule encompasses the "rule of good seamanship" and the "rule of special circumstance" which apply to all encounters between vessels where the risk of collision may be deemed to exist. If a collision might occur at the confluence of two rivers, "the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstance of the case" would be crucial in deciding fault.

Rule 9. Narrow channel. If two vessels were unable to meet at the confluence of two rivers without risking collision, the area could be considered a narrow channel. If one vessel was downbound and the other upbound on waterways which were in the Great Lakes, Western Rivers, or other waters specified by the Secretary, the vessel proceeding downbound with the following current would have the right-of-way over an upbound vessel as per Rule 9(a)(ii). In the same situation, if the vessels were in a narrow channel on other waters, the Rule 9(a)(ii) would apply, which would require each vessel to keep to the outer limit of the channel or fairway on her starboard side until the meeting had been completed.

Rule 13. Overtaking. Rule 13 could apply if both vessels were proceeding in the same downbound direction on different rivers and were meeting at their confluence. If one vessel were ahead of the other, the vessel deemed to be overtaking would be required to keep out of the way of the overtaken vessel until the vessel had been passed.

Rule 15. Crossing. If a vessel were downbound out of a river and intended to round to in order to head upstream, the vessel would most probably be crossing. If such were the circumstance, the vessel which has the other on her starboard side would be required to keep out of the way. A vessel could not, however, change its heading for the purpose of changing its status and claiming a privilege. It must further be mentioned that any vessel descending a river and attempting to round to in front of another vessel and head up into another river would be proceeding at great risk if it attempted to maneuver in front of another vessel. The responsibility rule (Rule 2) would certainly apply. Additionally, when vessels are navigating on the Great Lakes, Western Rivers, or waters specified by the Secretary, Rule 15(b) requires the vessel crossing a river to keep out of the way of a power-driven vessel which might be either ascending or descending the river.

If two vessels were downbound on different rivers and met at the designated confluence of two rivers at exactly the same time, then the vessel which had the other to starboard would have to keep clear. The other vessel would already be presumed to be on the starboard side of the channel, and its options would be limited in maneuvering except to stop and go astern.

Despite exhaustive research, we were unable to locate a single court decision which has interpreted Rule 95.07 of the Western Rivers Pilot Rules. We are thus unable to secure any guidance from the bench. Because there is no guidance, we were unable to find any previous collision resulting from a violation of this rule. We therefore believe that there is no need for any additional rule to govern the situation where two vessels might meet at the confluence of two rivers. We believe the rules are presently adequate to address the situation as described above. When mariners employ the rules and the precautions required by the ordinary practice of seamen, two vessels meeting at the confluence of two rivers will be able to navigate safely. ✱

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 IV of the survey deals with oil products.

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

1. Access

Problem: When accidents occur on board tankers in enclosed spaces, it is invariably necessary to enter with breathing apparatus and escape equipment.

Remedy. The access to pump room and cargo tanks needs to be designed with breathing apparatus in mind. It is best to have a clear lift for a harness from top to bottom of the pump room.

2. Alarms

Problem: When placed only in the cargo control room, alarms cannot be heard on deck when working on cargo.

Remedy: Fix external alarms.

3. Ballast system

Problem: The changeover from oil to ballast is time-consuming and labor-intensive, particularly with reduced crews.

Remedy. Segregate the two systems.

4. Cargo control room

Problem: A ship working cargo can be enveloped in gas clouds; therefore, the doors to the accommodation must be kept closed. This makes working cargo from an internal cargo control room difficult and hazardous.

Remedy. Site the cargo control rom with full visibility and direct access to the decks. The center should contain cargo pump controls, ballast controls, the cargo office, inert gas and oil-water content monitoring alarms, proper communication equipment, and an adequate office for cargo documentation reference books, the ship's data, and plans.

5. Catwalk

Problem: There is a frequent need to carry heavy equipment from the catwalk to the manifold area.

Remedy. Access from the catwalk to the deck should be wide enough for two people carrying equipment and should be fitted with adequate guard rails on both sides.

6. Computers

Problem: Loading, stress, trim, and ballast calculations have to be done quickly and accurately.

Remedy. Appropriate calculators should be provided for all tankers.

7. Cofferdam vent pipes

Problem: Under certain circumstances, it may be necessary to transfer oil products via a cofferdam suction, and oil leaks can leave the cofferdam full of oil.

Remedy. It is essential that vent pipes to these spaces are fitted with flame arresters.

8. Crude oil washing

Problem: The two main problems are that, with a badly designed system, operations are exceedingly labor-intensive, and expensive equipment can be damaged when there are oil surges due to butterfly valves being either fully open or shut.

Remedy. Individual machine supply valves should be sited close to the wash main allowing free drainage of as much supply pipe oil as possible direct to the tanks on completion. It is desirable to have valved gauged washing main end configurations to release inert gas air when pressurized. Gauges should have a readout at the control point. The supply of wash medium to the washing line should be as versatile as possible. Screw-down globe valves allow proper control; open/shut butterfly valves should be avoided. Adequate flanges should be supplied so that systems can be safely blanked off if machines are removed. Purpose-built tripod/sheer legs should be supplied for ease of maintenance.

9. Gas freeing

Problem: This is frequently carried out on gas carriers by purging LPG vapor with inert gas and venting to the atmosphere, frequently covering the deck with a high concentration of gases.

Remedy. It would be safer if a high-riser crude washing jet valve was fitted to disperse the gas to the atmosphere.

10. Gauges

Problem: When topping-off tanks, often the ullage gauges cannot be read at the control valve. Pressure valves and gauges which require an uninterrupted view on deck are often cluttered behind catwalk stanchions and other encumbrances.

Remedy. To avoid accidental spills, the information and control systems must be reconcilable at all times, and the design should reflect this. Gauges should be sited where they are easily accessible; glass or perspex facings should be anti-glare so that the gauge can be read with the aid of a flashlight. (The glass requires protection from abrasion.) Remote control gauges were listed as unreliable and need to be more robust.

11. Inert gas

Problem: Some ships are fitted with only one line and are therefore unsuitable for products. Frequently corrosion occurs in piping and scrubber units.

Remedy. Fit a minimum of two lines for product tankers and fit purge lines at the top and bottom for inerting and gas freeing on gas carriers. Inert gas lines should be of the right materials, with proper drainage, and scrubbers should be better designed.

12. LNG carriers

Problem: With cargo lines at -160°C on some ships, personnel have to clamber over such pipes to operate in the mainfold area. Some ships have two valves on a section of deck line. If both were closed with cargo trapped between, an explosion would probably result from the cargo's heating up in ambient temperatures.

Remedy. A better design is needed for the operator with respect to the cargo.

13. Maintenance

Problem: With reduced crews, good access to valves, flanges, and sections of pipe is essential. Pump rooms frequently have sections in awkward and inaccessible places.

Remedy: The ship's piping system should be designed with maintenance in mind. There should be a full mock-up of complicated areas.

15. Manifolds

Problem: The main difficulties are found in marrying up with shore couplings and the lack of leverage to fit heavy reducers.

Remedy. New construction should comply with all pertinent standards, lifting arrangements should be provided for reducers, and difficult access avoided to such items as the slops hose, which is frequently sited in a difficult position beneath manifolds.

16. Pump rooms

Problem: These appear to be designed solely from an engineering point of view and not with the operator in mind. Emergencies call for quick responses, and the atmosphere in the pump room needs to be monitored at all times. When a flange gives or a pipe bursts, it may be impossible to escape.

Remedy. Provide ergonomic access to all valves and pipes with clear markings and enough space allowed for emergencies. Mock-ups, complete with color coding and simulated failures, should take place at the design stage. Gas sampling and detection equipment should be fitted. Two separate means of access to the pump room, port and starboard, should be provided.

17. Valves

Problem: Valves which have only two modes of operation, e.g., fully open or closed, give rise to surge problems and do not allow fine adjustment for topping off. Where valves are controlled remotely, some systems do not positively indicate whether the valve is open or shut. Hydraulic systems are prone to failure.

Remedy. Valves should be installed with a full range of settings, indicators should show exactly the state of the valve opening at all times, and back-up isolating valves should be provided.

18. Insulation

Problem: Asbestos, which was widely used in ships for insulation and lagging, poses a serious health hazard.

Remedy. During retrofit, asbestos should be replaced with a different material. *

Keynotes

Final Rules		
CGD 83-067	Updates of References to 46 U.S. Code in 46 CFR Subchapter I-A (Mobile Offshore Drilling Unit Regulations)	(Oct. 4)
CGD 83-012	Certification, Safe Loading and Flotation Standards	(Oct. 5)
CGD 13 84-15	Anchorage Ground: Puget Sound Area, Washington	(Oct. 18)
CGD 83-004	Navigation Safety Regulations	(Oct. 29)
Notices		
CGD 80-024	Lifesaving Equipment for Great Lakes Vessels Emergency Position Indicating Radio Beacons	(Oct. 16)
CGD 84-076 CGD 84-077 CGD 84-078 CGD 84-079 CGD 84-080	National Boating Safety Advisory Council Committee and Subcommittee Meetings	(Oct. 18)
CGD 84-081	Houston/Galveston Navigation Safety Advisory Committee; Reestablishment	(Oct. 22)

Questions concerning regulatory documents or comments on the items described below should be directed to the Marine Safety Council at the following address:

Commandant (G-CMC)
U.S. Coast Guard
Washington, DC 20593
Tel.: (202) 426-1477

Updates of References to 46 U.S. Code in 46 CFR Subchapter I-A
CGD 83-067

Numerous general maritime shipping laws related to vessels and seamen were recently codified and enacted into positive law as Subtitle II of title 46, United States Code (46 U.S.C. 2101 through 13110). The purpose of this final rule is to amend the authority citations and references in 46 CFR, Subchapter I-A, to conform with the changes to title 46 U.S.C. This rule is effective as of October 4, 1984.

Certification, Safe Loading and Flotation Standards
CGD 83-012

This rule amends the Certifications Regulations in Subpart B of Part 181 and the Safe Loading and Flotation Standards in Subparts C, E, G, and H of Part 183 of title 33, Code of Federal Regulations. These amendments revise the regulations governing construction standards which apply to the manufacture of recreational boats. This rule is effective April 3, 1985, except for Table 4 in Subpart H, which will be effective July 2, 1986.

Navigation Safety Regulations
CGD 83-004

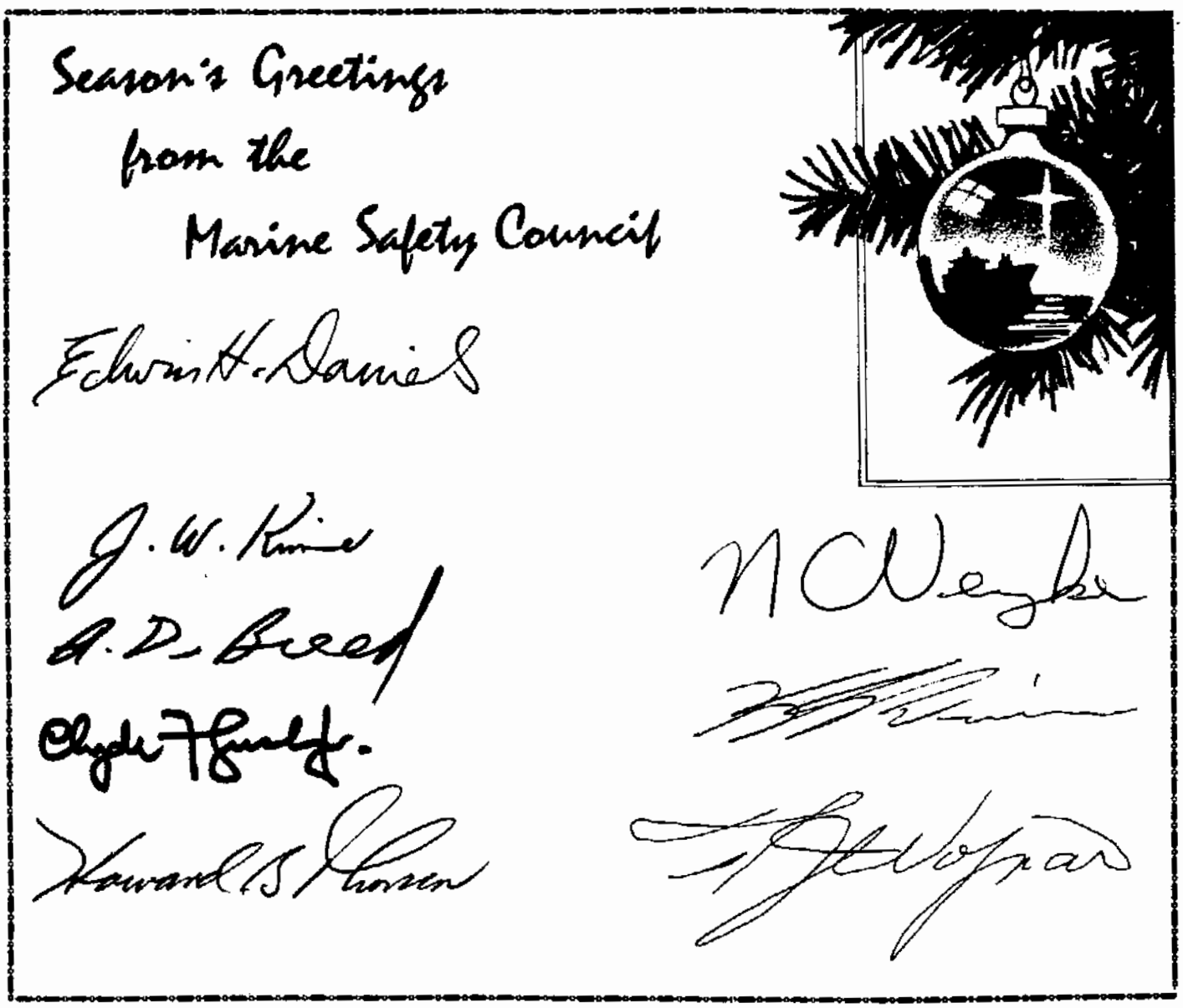
This rule modifies the Navigation Safety Regulations to conform with certain international requirements adopted in a revision of the International Convention for Safety of Life at Sea, 1974 (SOLAS '74). This rule is effective November 28, 1984. For further information, contact Mr. Edward J. LaRue, Jr., (202) 426-4958.

Actions of the Marine Safety Council

In October, the Council considered only one work plan.

CGD 84-073, Miscellaneous Changes to 46 CFR Subchapters D, H, I, and U: Changes in Requirements for Accommodations, Rails, and Guards

In a general housecleaning effort, the Coast Guard will propose that certain portions of the regulations be deleted as unnecessary and other parts revised because of minor inconsistencies which have crept in through the years. There are no economic, environmental, or safety issues involved. A notice of proposed rulemaking is expected in January 1985. *



Lessons from Casualties

The crew of an independent welding company were installing pipe on a drilling platform. Two employees, a rigger and a welder's helper, were suspended on a catwalk 10 feet below the main deck as they tightened bolts on the fire pump.

All work was proceeding smoothly as the crane operator began to lift pipe. To connect the main fire pump, the crew needed a section of curved 4-inch pipe 8 feet long on the catwalk level. The pipe had to pass through a 2'x2' manhole before the rigger and welder's helper could get to it.

The cable used to lift this piece of pipe was shackled to a welded padeye on the pipe itself. But on the opposite end, the cable was merely slung over the lifting hook.

As the pipe was lowered through the manhole, it hung up, and the unsecured cable slipped off the hook. The rigger and welder's helper glanced up just as the 8-foot section of pipe fell on them, knocking them off the catwalk and into the water. Both men were wearing lifejackets.

The rigger reported trying to swim to surface immediately, but he ran into the platform's cross brace under the water. Instead of panicking, he wrapped his arms around his lifejacket and let the current pull him free. When the rigger finally surfaced, he saw the welder's helper floating face down approximately 40 feet away, but he could not swim to him because of a broken arm, strong currents, and his own heavy clothing.

The two men were in the water almost 30 minutes before a rescue boat reached them. The welder's helper was dead. The hospital later reported that due to a skull fracture, the helper was probably unconscious when he entered the water, and the cause of death was listed as drowning.

There were several causes of this accident:

- The pipe section was not properly secured before lowering.
- The crew were not properly instructed by their supervisor to secure the pipe.
- The rigger and the welder's helper did not stand clear of the pipe as it was being lowered.

Following this casualty, the company which owned the platform instructed all of its employees and contractors in proper securing methods. *

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 dry liner has certain advantages over a wet liner. Replacement is less complicated because

A. of neoprene "O" ring seals.
B. honing makes it easier to maintain the desired oil film.
C. water seals and expansion joints are not required.
D. it fits more loosely due to a decrease in heat transfer through the composite wall.

Reference: Diesel and High Compression Gas Engines, Kates & Luck.

2. Compared with smooth tube construction, heat transfer in an economizer is increased by the addition of

I. radial aluminum fins.
II. gill rings.

A. I only
B. II only
C. both I and II
D. neither I nor II

Reference: Introduction to Marine Engineering, Latham.

3. A sectional (sinuous) header boiler is classified as a (an)

A. bent tube type.
B. straight tube type.
C. "A" type.
D. "D" type.

Reference: Marine Engineering, Harrington.

4. Machinery that drives fuel oil transfer pumps and fuel oil service pumps must be fitted with a remote means of stopping that machinery

A. within the space concerned.
B. outside the space concerned.
C. at the throttle station.
D. within the fire room.

Reference: 46 CFR 58.01-25

5. Simultaneous high cylinder firing pressure with low exhaust temperature can result from

A. improper fuel rack positioning.
B. lengthy exhaust valve duration.
C. extended operation at light load.
D. excessively early injection timing.

Reference: Diesel Engine Operation and Maintenance, Maleev.

DECK

1. You are fishing in international waters at night, and you sight a vessel showing three lights in a vertical line. The upper and lower lights are red, and the middle light is white. Which statement is true?

A. You must keep out of the way of the other vessel.
B. The other vessel is responsible for keeping out of your way.
C. The other vessel is at anchor.
D. The rule of special circumstances applies.

Reference: COMDINST. M16672.2

2. When a current flows in the opposite direction to the waves, the wave

A. height increases.
B. length increases.
C. velocity increases.
D. period increases.

Reference: American Practical Navigator, Vol. I, Bowditch.

3. What is meant by "thiefing" a petroleum cargo?

A. Syphoning off a few barrels of petroleum for shipboard use.
B. Determining the amount of water (if any) in each cargo tank.
C. Adjusting the cargo figures to coincide with the draft.
D. Reducing the gross cargo calculations to net amounts.

Reference: Tanker Operations, Marton.

4. You see a vessel's green sidelight bearing due east from you. The vessel might be heading

A. east.
B. northeast.
C. northwest.
D. southwest.

Reference: COMDINST M16672.2

5. What is the proper method of determining whether a portable CO_2 fire extinguisher needs recharging?

A. Check the tag to see when the extinguisher was last cleared.
B. Slightly discharge extinguisher to determine discharge pressure and agent content.
C. Weigh the extinguisher and compare the weight against that stamped on the valve.
D. Recharge the extinguisher at least once each year.

Reference: 46 CFR 31.10-18 (h)

ANSWERS

ENGINEER
1-C,2-C,3-B,4-B,5-D
DECK
1-A,2-A,3-B,4-D,5-C

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, tel.: (405) 686-4417.

How Long Will You Live?

The following life expectancy quiz is one of many health questionnaires now used by doctors, medical centers, and insurance groups. While such quizzes can hardly be precise enough to cause alarm for those who get low scores, they do give a more realistic picture of probable longevity than old-fashioned actuarial tables, which relied almost exclusively on the subject's hereditary patterns and medical history. Current computations try to measure risk in relation to environment, stress, and general behavior, although statisticians and experts do not always agree on how to weight the components.

Obviously, there are exceptions to most of the general rules that serve as the basis for these quizzes. For example, although stress is generally a life-shortener, a few people thrive on it. Also, married people tend to live longer because single life is supposedly more stressful, but some unhappy marriages will cause more, not less, stress. Common sense dictates where exceptions to the longevity rule will apply.

Take the quiz in the spirit in which is offered: as a guide, not predestination. Begin the quiz by allowing yourself 72 years, then follow the addition/subtraction instructions until your reach a final score.

Begin with 72.

Personal facts

If you are male, **subtract 3.**

If female, **add 4.**

If you live in an urban area with a population over 2 million, **subtract 2.**

If you live in a town under 10,000 or on a farm, **add 2.**

If any grandparent lived to 85, **add 2.**

If all four grandparents lived to 80, **add 6.**

If either parent died of a stroke or heart attack before the age of 50, **subtract 4.**

If any parent, brother, or sister under 50 has (or had) cancer or a heart condition, or has had diabetes since childhood, **subtract 3.**

If you earn over $50,000 a year, **subtract 2.**

If you finished college, **add 1.**

If you have a graduate or professional degree, **add 2.**

If you are 65 or over and still working, **add 3.**

If you live with a spouse or friend, **add 5.**

If you live alone, **subtract** 1 for every 10 years alone since the age of 25.

Lifestyle

If you work behind a desk, **subtract 3.**

If your work requires regular, heavy physical labor, **add 3.**

If you exercise strenuously (tennis, running, swimming, etc.) five times a week for at least a half hour, **add 4.**

If you exercise, but only two or three times a week, **add 2.**

If you sleep more than 10 hours each night, **subtract 4.**

Are you intense, aggressive, easily angered? If so, **subtract 3.**

Are you easygoing and relaxed? If yes, **add 3.**

Are you happy? **Add 1.** Unhappy? **Subtract 2.**

Had a speeding ticket in the past year? If so, **subtract 1.**

Do you smoke:

More than two packs of cigarettes a day? **Subtract 8.**

One to two packs? **Subtract 6.**

One-half to one pack? **Subtract 3.**

Are you overweight:

By 50 pounds or more? **Subtract 8.**

By 30 to 50 pounds? **Subtract 4.**

By 10 to 30 pounds? **Subtract 2.**

Do you drink the equivalent of 1½ ounces of liquor a day? **Subtract 1.**

If you are a man over 40 and have an annual checkup, **add 2.**

If you are a woman and see a gynecologist once a year, **add 2.**

Age adjustment

If you are between 30 and 40, **add 2.**

If you are between 40 and 50, **add 3.**

If you are between 50 and 70, **add 4.**

If you are over 70, **add 5.**

ADD UP YOUR SCORE TO GET YOUR LIFE EXPECTANCY:_____

(National average life spans: 70.5 for white males, 65.3 for all other males, 78.1 for white females, 74 for all other females.)

If your score on this quiz was lower than you'd like, here are 10 basic rules for longevity:

1. Don't smoke.
2. Don't drink.
3. Get 7 or 8 hours of sleep each night.
4. Eat breakfast daily.
5. Eat regular meals; don't snack or use fad diets.
6. Keep weight within 5 pounds of the recommended total for your age and build. (We all seem to know instinctively what our "best" weight is.)
7. Approach life with moderation; avoid physical and emotional extremes.
8. Relax. Cultivate serenity in your life.
9. Be optimistic. Hope for the best.
10. Don't get wrapped up in yourself and the present. Learn to think of others and be interested in the future.

This quiz is taken from the book **Lifegain**, by Robert F. Allen, Ph.D., with Shirley Linde.

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