

PROCEEDINGS

Vol. 28, No. 1

Marine Casualties— Prevention Through Legislation . . .

SS African Star and M/V Midwest Cities and Tow; Collision and Fire . . .

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FRONT COVER: Tows like this move in excess of 154 million tons of petroleum and petroleum products annually on United States Inland Waterways. Photo courtesy American Waterways Operators Inc.

BACK COVER : Safety cartoon by G. Seal, Pacific Maritime Association.

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OF THE

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MARINE CASUALTIES— PREVENTION THROUGH LEGISLATION

Commander John S. Lipuscek, USCG Chief, Casualty Review Branch, Merchant Vessel Inspection Division, Headquarters

THE STUDY OF marine casualties provides us with invaluable information in identifying programs which should ultimately lead to legislation designed to make our navigable waterways safer.

Three Coast Guard supported bills introduced in the last session of Congress promise to reduce several primary causes of vessel collisions. The proposed legislation dealing with the Unification of the Rules of the Road, Required Bridge-to-Bridge Radiotelephone Communication and Towboat Requirements, will attempt in certain areas and under certain circumstances to avert (1) meeting or passing without mutual agreement, (2) failure to communicate with another vessel by available means and (3) a number of other personnel faults. While not designed to eliminate personnel error, the bills nevertheless would require swift and, in the case of towboat operators, more knowledgeable communication and agreement between approaching vessels.

The significance of the pending legislative proposals as tools in reducing vessel casualties is best emphasized by looking at some recent disasters on the Mississippi River. While it is true that some problems are peculiar to the Mississippi, they nevFrom an address before the 1970 Marine Section, of the National Safety Congress and Exposition.

Commander Lipuscek, a 1943 graduate of the U.S. Merchant Marine Academy, Kings Point, New York, began his seafaring career with the Alcoa Steamship Co. and in 1953 joined the U.S. Coast Guard. He served aboard two Coast Guard Cutters and was attached to several marine inspection offices-Boiler and Hull Inspector and Investigating Officer in New York, Executive Officer of the Merchant Marine Detail in Yokohama, Japan, and Inspector and Investigating Officer in San Francisco. Following these assignments he became Officer in Charge, Marine Inspection, San Juan, Puerto Rico. In 1968, he assumed his present duty as Chief, Casualty Review Branch, Merchant Vessel Inspection Division at Coast Guard Headquarters.

ertheless manifest themselves on all waterways in a variety of situations.

UNIFICATION OF RULES OF THE ROAD

The United States has three separate sets of rules governing navigation on the Great Lakes, the Western Rivers, and other inland waters. Although similar, these rules nevertheless contain significant variations among themselves and differ pointedly from the more recent International Rules. H.R. 214 takes this into consideration, and contains rules conforming to the International Rules. The only exception is the inclusion of special rules designed to meet local conditions where necessary.

The 200 miles of highly congested waterway between Baton Rouge and the Head of Passes on the Mississippi River has undergone an unprecedented growth in recent years. Ever increasing amounts of hazardous materials are being shipped by water, and the vessels transporting them continue to increase in number, size, and speed. With heavy traffic a growing problem, dangerous complications result in this zone where the deep draft ocean freighter meets the conventional river tow. When the entire Mississippi River was governed by the Western Rivers Rules, which allow ascending and descending vessels to pass on either hand at the option of the downbound vessel, a custom was long judicially recognized that upbound vessels "took the points" and downbound vessels "took the bends". Recognition of the cus-



Photo Courtesy New Orleans States-Item

Shortly after colliding with the barge pushed ahead by the Warren J. Doucet, the flames from the Union Faith cast their deathly glow over the doomed vessel. (The outline of the Greater New Orleans Bridge is barely visible in the upper left corner).

tom was easy, because there is no narrow channel rule on the Western Rivers; and the "head and head rule" was modified as to vessels ascending and descending to allow, as mentioned, the descending vessels to choose the mode of passing whatever the relative aspects of the vessels were on first sighting.

In 1948 the River below the Huey P. Long Bridge was placed under the Inland Rules, which do have a narrow channel rule and do not have a special rule for vessels ascending and descending rivers as a qualification to the "head and head" rule.

The "Points and Bends Custom" is a necessity for many vessels in order to safely navigate the river. This is particularly apparent during times of high current velocity when a vessel using "Points and Bends" makes maximum use of the river current in this way. What happens is this: An ascending vessel comes up on the point or the inside of the bend. The current is at its weakest here and eddies flowing in the opposite direction often assist the vessel. A descending vessel entering a bend stays on the outer or bend side of the river. The flow of current tends to set a vessel across the river towards the bend; and with the following current a relatively high speed over the ground is realized, as well as an increased turning circle and increased difficulty in holding to the point. Assuming that half of the river bends are "bends to the right" and half are to the left, we are presented with a hazardous condition 50 percent of the time if two approaching vessels are expected to accomplish a "normal" port-to-port passing. We can dramatically demonstrate the danger of collisions by

showing a descending vessel approaching a bend to the right. If she is required to pass port to port she must hold to the point and attempt to overcome the forces of the current which are setting her across the river toward the bend and toward the ascending vessel which is keeping to her side of the channel under Article 25 of the Inland Rules.

Under Western Rivers Rules vessels are permitted to pass starboard to starboard or port to port providing they can do so safely. Article 25 of the Inland Rules, however, requires that "in a narrow channel every vessel shall, when it is safe and practicable, keep to that side of the fairway or midchannel which lies on the starboard side of such vessel." This in effect calls for vessels to normally pass port to port.

Confusion, therefore, does result

when an ocean going freighter meets a river towboat pushing barges ahead in the area of New Orleans above and below the Huey P. Long Bridge; because here lies the demarcation point of Western Rivers Rules and Inland Rules. Rules for navigation in this area must reflect the common sense and good seamanship of the "points and bends custom".

This principle is recognized and allowed in the proposed revision of Article 25 of the existing Inland Rules of the Road. In the pending revision vessels in narrow channels, proceeding with the current, will have the right of way and elect on which side to pass.

The following description of a collision between two vessels, taken from the record of the Marine Board of Investigation, will demonstrate the need for legislation on Rules of the Road Unification. Incidentally, this casualty also indicates the value of bridge-to-bridge radiotelephone communication capability.

In April of 1969 the New Orleans waterfront was the scene of an explosion and fire following a collision between the freighter Union Faith and the barge IOC No. 7, which was one of three loaded tank barges being pushed ahead by the tug Warren J. Doucet. The casualty occurred on a clear, dark night.

At approximately 1730 it was found that the Warren J. Doucet, bound for Baton Rouge, could not make sufficient speed up the river to continue alone. The tow was turned around above the Harvey Canal about 3 miles above the Greater New Orleans Bridge at 1830. The vessel proceeded downstream at a speed of 41/2 miles per hour maintaining a course which favored the right descending bank. At approximately one-half mile above the Greater New Orleans Bridge the course was changed to cross the river toward the bridge abutment located nearer the left descending side.

At 1840 the Union Faith weighed anchor and departed the General Anchorage about 5 miles below the Greater New Orleans Bridge bound for a dock 3 miles above the Bridge. At 1855 in the vicinity of mile 93 the Union Faith agreed both by bridgeto-bridge radiotelephone and whistle signals to a starboard-to-starboard meeting with the downbound SS *President*. At this time the Union



Faith was making good about 10 miles per hour favoring the right descending side in order to come up under Algiers Point. Before rounding Algiers Point the Union Faith met and passed the M/V Mama Lear and tow starboard to starboard. After rounding Algiers Point the Union Faith agreed by radiotelephone and whistle signals with the ferry Grescent and M/V Sassafras to a starboard-tostarboard meeting. The master of the Sassafras had called the master of the M/V Toni Ann, whose tow was about 1,000 feet astern, advising that the Union Faith would pass starboard to starboard if agreeable. The Toni Ann acknowledged and found this meeting agreeable. The Toni Ann, as she cleared the Greater New Orleans Bridge, sighted the lights of the Union Faith coming around Algiers Point. After meeting the Toni Ann, the Union Faith altered course towards the left descending bank of the river. The radiotelephone possessed by the pilot on the Union Faith operated on channel 13, 156.65 MHz, and therefore was unable to communicate with the Warren I. Doucet, which had radiotelephone capabilities on frequency of 2738 KHz. However, there are no regulations requiring bridge-to-bridge radio communication capability. The lights of the Union Faith were first sighted at a distance of 11/2 miles by the Warren 1. Doucet. Shortly thereafter the Warren I. Doucet blew a two-blast



The Warren J. Doucet.

signal for a starboard-to-starboard passing which was not answered. She then blew another two-blast whistle signal while maintaining her course and speed across the river. No answer was heard. The collision occurred at about 1915 just upstream of the Greater New Orleans Bridge. Twenty-five persons lost their lives in this collision, and the two vessels sank.

BRIDGE-TO-BRIDGE RADIO-TELEPHONE

Provisions for whistle signals have been in existence for a long period of time to show the intent of vessels when sailing on the inland waters of the United States. However, our statistics reveal that the failure to communicate and mutually agree upon the method of passing between vessels is one of the major factors contributing to collisions. Approximately one half of the vessels involved in collisions did not attempt to exchange whistle signals as required by national rules, thereby demonstrating personnel error in itself as a primary cause of collisions. The failure to arrive at an early passing agreement through whistle signals and voice radio inevitably results in the failure to make timely decisions which are essential if collisions are to be avoided.

Three problems plaguing the use of and response to sound signals are: (1) The failure to understand them, (2) the failure to hear or respond to them, and (3) the failure to establish correctly the direction and nature of their source.

The noise level and wind velocity and direction will frequently create a sound barrier to persons on the bridge. However, it is difficult to understand the reasons for the failure to respond to signals when heard and understood.

Perhaps a reason for our current problems with whistle signals lies in the increased size and speed of ships entering inland waters. Coupled with periods of poor visibility, these increases make the effective use of whistles extremely difficult. To remedy this situation legal requirements for direct radio communica-



tion between the pilot houses, or bridge-to-bridge radiotelephone, have been proposed in, and are currently pending action by the Congress. These requirements are essential for safer navigation and, have the full support of the Coast Guard.

The collision previously described between the Union Faith and the tank barge IOC No. 7, being pushed ahead by the towing vessel Warren I. Doucet, showed the need for legislation covering unification of rules of the road as well as bridge-to-bridge radiotelephone. Another case on the lower Mississippi River which dramatically demonstrates the need for bridge-to-bridge radiotelephone legislation occurred during the early morning of 16 March 1968. It involved the SS African Star and the barge Intercity No. 11 (one of two loaded tank barges being pushed

ahead by the towing vessel Midwest Cities, piloted, incidentally, by unlicensed personnel). According to the Marine Board convened to investigate this casualty, the tank barge was loaded with a cargo of highly volatile crude oil. As the vessels were closing prior to the collision, the upbound M/V Midwest Cities was directing her course at an angle across the river toward the left descending bank after passing Pointe a la Hache. The downbound African Star was about midriver with the intention of conducting a starboard to starboard meeting situation. The pilot on the African Star, using his portable radiotelephone, attempted to contact the Midwest Cities prior to the collision. There was no response. Why was there no response? Simply because the radiotelephones on the two vessels were not designed to operate on the same frequency. The Midwest Cities used 2738 KHz and the African Star was designed for 156.65 MHz. Consequently, it was impossible for the two pilots to communicate by radio. The tank barge and the freighter collided and a fire and explosion ensued almost immediately on both vessels. Twenty-one persons aboard the African Star lost their lives, and the tank barge burned and sank in the river. Fiercely burning oil spread to the African Star. With many secondary fires in combustible material on board, the African Star backed out of the barge and was purposely beached on the right descending bank. Heroic members of the crew



The Midwest Cities.

successfully contained the fire.

Captain Paul Ives, when chairman of the Bridge-to-Bridge Radio Com-



mittee of the American Pilots Association stated, "our pilots will attest to the fact that single channel bridgeto-bridge radio will work indeed under all imaginable conditions of adverse weather and traffic density. It is not unusual to have a traffic situation involving 10 or more vessels in sight of one another at any given time".

Captain Ives' comments were made with reference to the Delaware Bay and River where bridge-to-bridge radiotelephone communications have been in use since 1 November 1960. During the 5 years and 10 months preceding the implementation of bridge-to-bridge radio, there was an average of 1.27 collisions per month. The first few years after the use of bridge-to-bridge radiotelephone, collisions gradually dropped to an average of 0.91 per month. Later, during 1966 and 1967, the number of collisions dropped drastically to the figure of 0.23 per month. Our Philadelphia records show that for 1968 and 1969 not one collision occurred between vessels underway that were equipped and using radiotelephone communication. These outstanding results were achieved during that period of time when the Delaware River witnessed a large increase in tonnage as well as a greater number of vessels, carrying with it the inevitable potential for a higher collision rate area.

The obvious advantage of bridgeto-bridge radiotelephone is the ability for pilots to communicate, to reach early agreements, and to take the necessary positive actions to insure safety.

TOWBOAT LEGISLATION

In September of 1961 the Coast Guard initiated a comprehensive study of towing vessel casualty statistics in an effort to determine whether the inspection of steam towing vessels and the licensing of their operating personnel should be extended to include diesel towing vessels. The study indicated that the inspection of all towing vessels and licensing of their personnel were essential to the

The position has always been that it is inequitable for steam towing vessels to be subject to inspection and licensing whereas diesel vessels of the same type and size were exempt. Statistical analyses of towing vessel casualties now indicate a deficiency in safety due to the lack of qualified and properly trained towing vessel operators. The statistics have been updated each year, and continue to reveal personnel fault on the part of towing vessel operators as a primary cause of towing vessel accidents. Therefore, we strongly support that aspect of a current House Bill, H.R. 13987, requiring persons in charge of a towing vessel's direction and control to be federally licensed. We feel that such a licensing program would be a significant first step in reversing the casualty trend. We will wait until the program is operational before assessing its impact on maritime safety and the need for supplemental legislation.

Three important lessons were learned from the previously discussed tragedies, which reemphasize the need for unification of the rules of the road, bridge-to-bridge radiotelephone and licensing of personnel operating towing vessels. The African Star and Union Faith were in collision with vessels directed and piloted by unlicensed personnel. There is no licensing requirement for personnel operating towing vessels similar in size and operation such as the Midwest Cities and Warren J. Doucet. In fact, the record of the Marine Board of Investigation revealed that the person in charge of the Midwest Cities at the time of the collision with the African Star had ability to read and write limited to little more than signing his name.

The recent sinking of a towing vessel in the Gulf of Alaska points out the potential need for inspection of certain categories of towing vessels. The *Intrepid*, towing an inspected sea-going freight barge, was on a voyage from Seattle, Wash., to Whittier, Alaska. Three persons lost their lives when the vessel sank during a severe storm with seas reported to be 20 feet in height and winds in excess of 50 knots. The *Intrepid*, built in 1965, was an uninspected, welded steel, single screw, diesel-propelled vessel of 199 gross tons. It was constructed and operated without any statutory requirements relative to plan-review and periodic inspection or drydocking. The vessel was not classed, but was in compliance with the 1930 Load Line Convention. There was no requirement for licensed personnel to be on board. Prior to her final vovage the vessel was operated in Alaskan waters and had a history of hull fractures. The adequacy of repairs made to the hull are not known as they were neither approved nor examined by the Coast Guard or a classification society. On the night of 19 February 1970 the Intrepid took an unusual roll to starboard estimated to be 60° at about 2100 hours. The reason for the roll was never fully established; however it was assumed to be the result of heavy weather. At about 2115 an attempt was made to haul in some of the tow wire; but because of the amount of water on the after deck, the crew was unable to reach the winch. Shortly afterward an internal examination of the vessel was made to determine why the stern was riding so low in the water. It was found that the watertight door leading to the lazarette could not be opened because of the water in the lazarette. Pump suction was started on this compartment. Meanwhile weather conditions worsened, and the vessel's heading was brought around into the wind and sea. At approximately 2330 the Intrepid took another heavy roll to starboard. This roll, together with further submersion of the stern, allowed water to enter the engine room resulting in the loss of all power. The vessel started sinking by the stern and was totally immersed in 10 or 15 minutes. We believe that the flooding of the after compartment and the starboard ballast tank was caused by fractures in the underwater body. The sinking of the Intrepid possibly could have been prevented by timely and adequate inspection.

CONCLUSIONS

How would the passage of these

pieces of legislation improve maritime safety and decrease vessel collisions? Unification of the rules of the road would remove the confusion that exists on vessels passing from one rules of the road zone to another. The "narrow channel rule" under the Inland Rules and the "points and bends" customs would be compatible. Today a vessel operating in the Gulf of Mexico could easily be faced with the problem of operating under three different sets of rules on the same day. I have shown earlier the dramatic effect bridge-to-bridge radiotelephone has on reducing vessel collisions in the Delaware Bay. What better way is there to lessen the occurrence of vessel collisions than establishing a positive, sure and exact method of deciding how two vessels are to pass in inland waters? Bridge to bridge would not eliminate the requirements for whistle signals, but it would indeed provide an important tool to supplement the whistle and one which is entirely compatible with radar. Towboat Legislation would provide licensing requirements for vessel operating personnel. If we were to construct a graph from our statistical studies of inland towing vessel casualties, it would reveal personnel fault as the major cause of such casualties. With regard to towing vessels operating on the high seas, our studies show vessel construction and maintenance deficiencies to be the major cause of casualties. The Coast Guard has, therefore, taken the position that future legislation requiring inspection of certain categories of towboats may be required.

With each collision, the need for legislation in the areas of bridge-tobridge radiotelephone, unified rules of the road and towing vessels becomes even more urgent. These tragedies should convince us that unless preventive measures in the form of the legislation discussed are enacted, the same types of casualties will occur in greater numbers. The safety of life and property is too important to delay these positive programs. ‡





Photo by Detroit News

Captain Howell, at his home in Troy, Mich., is unequalled in pilotage endorsements.

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Capt. Morgan Howell Issued New License

Captain Morgan L. Howell's recently issued license bears pilotage endorsements covering more routes and more miles than anyone else known to Coast Guard licensing officials.

He has demonstrated his familiarity with the 1,300 miles of the St. Lawrence Seaway System and Great Lakes between Montreal and Chicago. His knowledge extends 1,300 miles to the south on the Mississippi River from St. Louis through New Orleans Harbor. In New York, he is qualified to pilot 340 miles of the New York State Barge Canal between the Hudson and Niagara Rivers, the Hudson from Yonkers to the sea, including New York Harbor, and the Niagara River where he began his career a half century ago as a \$1-aday deckhand on a sidewheeler.

Perhaps the most outstanding demonstration of his professionalism and seamanship was during the period from 1957 to 1962 when he was master of the passenger ship, SS *Aquarama*, a converted C-4 of 12,773 tons, which sailed daily between the busy harbors of Cleveland, Ohio, and Detroit, Mich. His unequaled proficiency in docking and undocking the light-loaded *Aquarama* without tug assistance in the congestion of both harbors will remain for years in the minds of the many awe-struck spectators.

Although the Aquarama has been laid up and Captain Howell is free to spend more time at home in Troy, Mich., he still enjoys "ferrying" new ships from Great Lakes shipbuilders to various ports and piloting foreign freighters through the Great Lakes. Ashore, he attends seminars in naval architecture at the University of Michigan. In an age of automation, Captain Howell's broad ranging experience earns him great credit as a master mariner. ‡

Economy Move Closes Two Ports of Merchant Marine Library Assn.

The American Merchant Marine Library Association has closed its port offices at Norfolk and San Pedro, Calif., in a major economy move.

The organization's 1969 income totaled \$126,365 against expenses of \$131,974, a loss of \$5,609. For the past several years, the Association has been forced to rely on its reserve funds to continue operation.

According to Mrs. George Emlen Roosevelt, AMMLA Chairman, the library system forsecs no improvement in the future without substantial financial assistance from contributors.

The closing of the two ports leaves AMMLA with offices at New York, national headquarters; Boston, New Orleans, San Francisco, Seattle, and Sault Ste. Marie, Mich.

AMMLA was established in 1921 as an outgrowth of World War I library service to American merchant ships by the U.S. Shipping Board and the American Library Association. AMMLA, which is due to mark its golden anniversary next May, has distributed more than 16 million books and many more magazines to ships of the American Merchant Marine, the U.S. Coast Guard and other waterborne operations of the Government, £

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SS AFRICAN STAR AND TOW; COLLISION AND FIRE WITH LOSS OF LIFE

COMMANDANT'S ACTION

1. The record of the Marine Board of Investigation ¹ convened to investigate the subject casualty has been reviewed and the record, including the Findings of Fact, Conclusions, and Recommendations, is approved subject to the following comments and the final determination of the cause of the casualty by the National Transportation Safety Board.

2. At 0340 CST; 16 March 1968, the dry cargo vessel SS African Star collided in a meeting situation with the tank barge Intercity No. 11, being towed by pushing ahead of the M/V Midwest Cities in the lower Mississippi River at Mile 46 Above Head of Passes.

3. Approaching Socola Light (Mile 44.8) from New Orleans the axis of the river changes from about 143°T to 113°T at Mile 45 as it rounds Pointe a la Hache.

4. During the early morning hours of 16 March 1968, there was reported some haze and patch fog on the river. At the time of the casualty the weather was clear and the visibility was good. The radar units on the African Star and Midwest Cities were in operation before and at the time of the collision, but were not continuously observed by the watch personnel of either vessel.

5. The African Star was enroute New Orleans to Newcastle, Australia, with 11 passengers, 52 crew members and 5,364 tons of general cargo. Her speed over the bottom with a one (1) knot following current was estimated to be 16 knots. The Bolivar Maru was also downbound and approximately 10 miles ahead of the African Star proceeding at the same speed. The respective pilots communicated with each other on portable transceivers using the frequency of 156.65 MHZ regarding traffic and weather conditions. The pilot of the Bolivar Maru reported that the African Star could expect to meet two upbound tows about Bohemia Light (Mile 44.9). Approaching Favret Light, Mile 52.5, an upbound vessel, the



The small triangular object protruding from the surface of the water in the upper right corner is all that is visible of the Intercity barge. With smoke still billowing from the African Star, she rests safely aground on the bank of the river.

Hellenic Charm was sighted. Agreement was reached by communicating on 156.65 MHZ to a starboard to starboard meeting. The vessels met at Mile 50 with the Hellenic Charm in mid river and the African Star favoring the left descending bank. At 0324, the vessel's speed was slowed to half ahead when approaching Pointe a la Hache ferry crossing. Speed was increased to 21 nozzles, equivalent to about 16 knots at 0331. After clearing the Hellenic Charm, as the African Star widened to midchannel, an upbound tow was sighted above Bohemia Light. Whistle signals for a meeting situation were exchanged for a port to port passing. The tug El Cello Grande and tow favoring the left descending bank met the African Star at Mile 47. When clear of the El Cello Grande the lights of the Midwest Cities came into view. At 0336, while on a heading of 140°T, a green side light and two white lights in a vertical line were first observed off the starboard bow at a range of 11/2 miles. The record indicates that the required amber and colored side lights on the lead barge Intercity No. 14, and the white towing

¹Due to space limitations the Coast Guard record of the Marine Board of Investigation is not printed herein.

M/V *MIDWEST CITIES* AND-ON THE MISSISSIPPI RIVER ON MARCH 16, 1968



Severely scorched by the burning oil which quickly spread from the Intercity barge, the African Star lists to starboard after members of her crew valiantly maneuvered the vessel to shore.

lights and colored side lights on the Midwest Cities, were burning brightly. The report, however, does not reveal whether the amber light or which of the side lights on the tow or the tug were seen from the African Star. The African Star's rudder was ordered left 15° and then midship to open the range lights and to better show the green light to the Midwest Cities. As the vessels closed the African Star sounded a two blast passing signal. This was not heard on the Midwest Cities. The pilot moved to the radar scope to look at the visual presentation when he was alerted by the Third Mate that a vessel was crossing in front of the African Star. The tug and tow appeared to be crossing sides of the river in front of the African Star, Collision was imminent. The danger signal followed by one blast of the whistle was sounded by the African Star. The rudder was ordered hard right, and at 0338 stop was rung on the engine order telegraph followed by full astern at 0339. The African Star started swinging to the right when at 0340 on a heading of 153°T, the bow struck the after port side of the Intercity No. 11 at an angle of 45°.

January 1971

6. The Midwest Cities enroute from Shell Terminal, Southwest Pass, La., to Texas City, Tex., via the Gulf Intercoastal Waterway was upbound in the Mississippi River making six (6) statute miles per hour over the bottom stemming a one knot current towing by pushing ahead the unmanned tank barges Intercity No. 11 and Intercity No. 14. Each barge was loaded with 19,050 barrels of crude oil. The length of the tug and barges was 611 feet. Approaching Point Michel, Mile 43.8, another upbound tow, tug El Cello Grande overtook the Midwest Cities at 0320. A passing agreement was reached by using voice radio, 2738 KHZ, whereby the El Cello Grande was to favor the right descending bank of the river. During this period, as the El Cello Grande was overtaking the Midwest Cities, a downbound freighter, the Bolivar Maru met and passed clear with the El Cello Grande starboard to starboard and with the Midwest Cities port to port. At a distance of 11/2 miles the range lights and red side lights of the African Star were sighted. The record and report do not reveal the range light aspect as sighted from the Midwest Cities; it did, however, determine that the port side light on the Intercity No. 14 was being displayed unscreened on an oil drum at the time of the collision. When collision was evident, the rudder of the Midwest Cities was put over to the right and the engine was put in reverse. The danger signal was sounded by the Midwest Cities, and at the same time the danger signal was heard from the African Star.

7. The crude oil cargo on the barge ignited seconds after the collision. Several explosions on the barge caused oil to be sprayed on the African Star. The fiercely burning oil ignited many secondary fires in combustible material on board the vessel. When the fixed CO_2 system was discharged to fight the fire in No. 5 hold, a flexible line ruptured between a cylinder valve and the header. This did not prevent the effectiveness of the CO_2 or the containment of the fire in the hold. The African Star backed out of the barge shortly after the collision and was purposely beached on the right descending bank at Mile 45.9. The Intercity No. 11 sank in 43 feet of water about 700 feet from the right descending bank at Mile 45.8.

8. As a result of the collision two passengers and fifteen crew members were killed, four members of the crew are missing and presumed dead, and a total of thirty-one crew members and nine passengers were injured from the *African Star*. There were no injuries or deaths aboard the *Midwest Cities*.

REMARKS

1. Marked conflict in the record between the witnesses of the two vessels, together with the lack of evidence of the range light aspect and other vital material necessary to establish accurate positions of the vessels, make the reconstruction of events leading up to the collision impossible.

2. In concurrence with the Board's Conclusion No. 1, it is considered that the primary cause of the casualty was the failure of the *African Star* and *Midwest Cities* to agree on a method of passing.

3. In further concurrence with the Board's Conclusion No. 3, it is considered that the responsibility for this casualty rests solely with the pilots of the two vessels. It is concluded, however, that there was a greater degree of culpability on the part of the pilots than the "poor judgment" indicated by the Board.

4. There is evidence of violation of the Inland Rules of the Road on the part of the pilot of the African Star:

a. The failure to reach timely agreement for safe passing when meeting another vessel (33 U.S.C. 203, Rule I).

b. The failure to sound a timely danger signal in the face of the uncertainty regarding the course and intentions of the *Midwest Cities* when no answer was received to the initial passing signals (33 U.S.C. 203, Rule III).

5. The pilot of the African Star displayed poor judgment, if not negligence, in shifting from visual to radar observation of the movements of Midwest Cities when he had heard no response to his one-blast passing signal.

6. The evidence of negligence and violation of Inland Rules of the Road on the part of the pilot on the SS *African Star* will be forwarded for appropriate action to the American Pilots Association.

7. There is evidence of violation of the Inland Rules of the Road on the part of the pilot of the M/V Midwest Cities:

a. The failure to reach a timely agreement for the port to port passing intended by the *Midwest Cities* (33 U.S.C. 203, Rule I).

8. There is evidence of violation of the Inland Rules of the Road on the part of the owners of the *Intercity No. 14* for navigating the vessel while displaying the port side light unscreened. (33 U.S.C. 157), (Pilot Rules 33 CFR 80.16).

9. The evidence of violations on the part of the pilot of the M/V Midwest Cities and on the part of the Inter-

city No. 14 will be forwarded to Commander, Eighth Coast Guard District for appropriate action under the Administrative Penalty Procedures.

10. We cannot concur with the Board's Conclusion No. 7 that there was no evidence of material failure due to the fact that a flexible CO_2 line ruptured aboard the SS African Star. This, however, did not contribute to the casualty.

11. It is further considered that the record in this case contains evidence of criminal liability within the purview of Title 18 U.S.C. 1115 on the part of the pilots of the two vessels. Accordingly, this case will be referred to the Department of Justice for possible prosecution.

12. Appropriate action is being taken to suitably recognize those crew members who demonstrated meritorious and heroic action aboard the SS *African Star* during the period following the collision.

13. Legislation for bridge-to-bridge, voice radio communication between vessels, and licensing requirements for persons in charge of the navigational watch of towing vessels, is now pending in Congress.

> W. J. SMITH, Admiral, U.S. Coast Guard, Commandant.

13 MARCH 1970.

ACTION BY THE NATIONAL TRANSPORTATION SAFETY BOARD

This casualty was investigated by a U.S. Coast Guard Marine Board of Investigation convened at New Orleans, La., on March 21, 1968. A representative of the National Transportation Safety Board attended a portion of these proceedings as observer. We have reviewed the investigative record and considered those facts which are pertinent to the Board's statutory responsibility to make a determination of cause or probable cause and make recommendations to prevent recurrence.

SUMMARY OF FACTS

The collision of the downbound cargo vessel SS African Star and upbound towing vessel M/V (Motor Vessel) Midwest Cities' tank barge Intercity No. 11 occurred at 0340, c.s.t. March 16, 1968, at about Mile 46 Above Head of Passes (AHP) in a fairly straight and wide part of the Mississippi River. Fire and explosions caused by this collision resulted in the sinking of the barge Intercity No. 11, and severe damage to the African Star and her cargo. Of a total of 11 passengers and 52 crewmembers in the freighter, two passengers were killed and nine were injured; 15 crewmembers were killed, four are missing and presumed dead, and 31 were injured. The Midwest Cities was pushing two barges, of which Intercity No. 11 was the second. The African Star was making good about

16 knots on a course of 140° true, the Midwest Cities 6 knots, course 320° true, a few minutes before the collision. Visibility at night was good, and both vessels had been advised on different radio frequencies of the other vessel's movements. Direct communication between these vessels was not possible due to lack of a common frequency. Both vessels were equipped with marine radar which was in use. Both pilots sighted the other vessel on radar after the initial visual sighting. The pilots of both vessels sighted the navigation lights of the other vessel at about 11/2 miles. Witnesses on other passing vessels stated that the navigation lights on the African Star, Midwest Cities, and Intercity No. 14 were readily seen. The wind and current did not materially affect the relative movements of either vessel. The steering gear and machinery of both vessels were in good operating order. The African Star and Midwest Cities had passed other vessels during the midwatch, and the pilots in charge had safely navigated their vessels. The pilot on the African Star was a licensed pilot, but the pilot of the Midwest Cities was unlicensed. Both pilots had extensive experience on the Mississippi River. A lookout was posted on the bow of the African Star, but not on the Midwest Cities. The master, third mate, and helmsman were also on the bridge of the African Star.

Two divergent versions of maneuvers resulting in this casualty were given by the personnel on the two vessels involved. The pilot of the Midwest Cities stated that when he sighted the African Star's range and red sidelights on his port bow at about 11/2 miles, the Midwest Cities was about 250 feet from the east bank, running parallel to the side of the river. He considered it to be a head-and-head meeting situation, and he sounded the appropriate one-blast whistle signal for a port-to-port passing, to which the African Star responded with one blast. He assumed a safe passage until the African Star sounded two blasts when her bow was abeam the lead barge. He saw the African Star's green sidelight and responded with one blast. He then blew four blasts on the whistle, backed full from full ahead, put the rudder hard right, but it was too late to avert the collision. The bow of the African Star cut into the port side of No. 4 tank of Intercity No. 11 at an angle of about 45°. The Midwest Cities was made up to the rake end of this barge. After the impact, the lead barge Intercity No. 14 broke adrift, and the starboard wire on the Intercity No. 11 parted, but the port wire was still secured to the towing vessel. When fire broke out on the barge and surrounding river, the pilot of the Midwest Cities backed full to part the port wire and to clear the intense fire. He estimates it took about a minute to get free, and his vessel was backing towards the west bank. The captain of the towing vessel then relieved him, and proceeded to skirt the fire in the river and assist the burning African Star.

The pilot of the African Star later related a completely

different chain of events leading to the collision. He stated that after clearing several vessels, and making 16 knots, the African Star was slightly west of midriver when he sighted the Midwest Cities' two white tow lights and green sidelights on his starboard bow, just above Socola Light. The tow appeared to be favoring the west bank and running parallel to it. It appeared to him to be a normal starboard-to-starboard meeting situation, never a head and head meeting. Both pilots stated that they were following the local practice of "points and bends," which required the upbound tows to favor the points and descending deep draft vessels to favor the bends or midchannel. He ordered the rudder 15° left, to "give a more perfect green to green light." Shortly afterwards, the rudder was placed amidships to check the ship's swing, which put the ship a little east of midchannel. When the Midwest Cities tow was one-half to three-quarters of a mile ahead, he sounded two short blasts on the whistle, but no reply was heard. As the pilot headed for the radar, the third mate called his attention to the tow which was crossing his starboard bow showing red sidelights. This was about 2 minutes after the two-blast signal was sounded. The danger signal was sounded. Hard right rudder, one blast, then emergency full astern were ordered and executed. By this time, the situation was beyond the point of taking corrective action and the African Star's bow penetrated into Intercity No. 11 on the port side of the tow, at about a 45° angle. Full astern was in effect a minute before the collision. Fire and several explosions resulted in less than a minute, and the southeasterly wind engulfed the African Star in flames. The pilot backed clear, and intentionally grounded the vessel on the west bank at Mile 45.8 (AHP). Burning oil from the barge ignited the tarpaulins, and fires started in Nos. 2, 4, and 5 holds on the African Star. Deck cargo was ignited, the paint on the ship burned, and dense smoke filled the engineroom and accommodation spaces. The aluminum containers on deck were melted, and their contents burned. Three days were required to extinguish the fire in No. 5 hold. Problems were experienced in lowering the boat and launching the inflatable liferaft, as the boat cover and man ropes burned and the plastic cover of the liferaft was ignited. The intense fire and smoke in the quarters gutted the passageways, and a number of passengers and crewmembers were trapped. Several persons escaped from rooms through portholes when the passageways outside their quarters were impassable. Several persons were burned due to ignition of the life preservers and clothing they were wearing. Six burned bodies were found at the top of the ladder leading from the cabin deck to the main deck, where a wooden gate was fitted across the top of the ladder.

The Intercity No. 11 grounded and sank near the west bank at Mile 45.7 (AHP). After being released by the Coast Guard, the *Midwest Cities* recovered the loose Intercity No. 14 and secured it, undamaged. The towing vessel sustained minor damages. Total cost of this collision exceeded \$1 million, exclusive of cargo damage on board the African Star.

Rescue operations were commenced promptly after the Midwest Cities requested immediate assistance via the marine operator in New Orleans. Coast Guard helicopter evacuation of badly burned victims was rapid and certainly saved the lives of persons injured on the African Star. The Midwest Cities, a New Orleans fireboat, and a local ferry with a firetruck on board assisted the Coast Guard boats in fighting the fire. Several crewmembers of the African Star demonstrated unusual bravery in fighting the fire on deck. Fighting the fire was complicated by inaccessibility of the cargo manifest of hazardous materials, which was located in the chief mate's room. Power was maintained on the African Star to keep the vessel aground, and to keep lights, and the fire and bilge pumps in operation. The loss of life would have been more severe except for the gallant effort of the vessel's crew and others involved in the rescue and firefighting operations.

ANALYSIS

The Commandant concluded that the witnesses of the two vessels gave such conflicting testimony that it was impossible to reconstruct the events leading up to the collision. The Safety Board is not in a position to judge the credibility of the witnesses, and is therefore not able to resolve the conflicts in their testimony. However, it is readily apparent that the pilots of both vessels failed to communicate properly under the existing collision avoidance system. A careful analysis of all causal factors in this case was made in an effort to determine the underlying causes of this tragic casualty.

The African Star and Midwest Cities were subject to the Inland Rules of the Road and Pilot Rules at the time of the collision. Prudent compliance with these rules by both pilots would have averted the collision. The Coast Guard concluded that both pilots violated 33 U.S.C. 203, Rule I, which requires:

"When steam vessels are approaching each other head and head, that is, end on, or nearly so, it shall be the duty of each to pass on the port side of the other; and either vessel shall give, as a signal of her intention, one short and distinct blast of her whistle, which the other vessel shall answer promptly by a similar blast of her whistle, and thereupon such vessels shall pass on the port side of each other. But if the courses of such vessels are so far on the starboard of each other as not to be considered as meeting head and head, either vessel shall immediately give two short and distinct blasts of her whistle, which the other vessel shall answer promptly by two similar blasts of her whistle, and they shall pass on the starboard side of each other.

"The foregoing only applies to cases where vessels are meeting end on, or nearly end on, in such a manner as to involve risk of collision; in other words, to cases in which, by day, each vessel sees the masts of the other in a line, or nearly in a line, with her own, and by night to cases in which each vessel is in such a position as to see both the sidelights of the other.

"It does not apply by day to cases in which a vessel sees another ahead crossing her own course, or by night to cases where the red light of one vessel is opposed to the red light of the other, or where the green light of one vessel is opposed to the green light of the other or where a red light without a green light or a green light without a red light, is seen ahead, or where both green and red lights are seen anywhere but ahead."

The pilot of the *Midwest Cities* testified that he was complying with the first sentence of this rule, which applies to vessels approaching each other head and head, and proposed a port-to-port passing. The pilot on the *African Star* testified that he did not interpret the meeting situation as being head and head, and considered himself to be governed by the second sentence of Rule I. Upon hearing no reply to his whistle signal, however, he failed to comply with Rule III of this section which requires:

"If, when steam vessels are approaching each other, either vessel fails to understand the course or intention of the other, from any cause, the vessel so in doubt shall immediately signify the same by giving several short and rapid blasts, not less than four, of the steam whistle."

The Inland Rules of the Road do not explicitly state what other action should be taken by vessels when an agreement to pass is not mutually adopted. However, in the exercise of due regard for danger of collision, the pilots should have stopped, and backed their vessels' engines when they were in doubt as to the other vessel's intentions. Rule 25(a) (iii) of the proposed "United States Nautical Rules" (H.R. 214) would make such action mandatory. However, under the General Prudential Rule (Article 27) of the present rules, such action is indicated.

The question whether the meeting of the African Star and Midwest Cities was a head and head situation was not answered by the Coast Guard investigative report. In a head and head meeting situation, Rule I requires each vessel to pass on the port side of the other. A definite determination of this question is further complicated by the legal acceptance of the "points and bends" local practice. This provides that with mutual assent upbound tows favor the points, and downbound deep draft vessels favor the bends of the river. Large tows experience practical problems in navigating sharp bends, and seek the less strong current in the lee of the points when upbound.

Use of the locally accepted "points and bends" practice can result in conflict with the Inland Rules of the Road. This practice often results in a starboard-tostarboard passing in the meeting situation. The reach of the river was almost straight in the area of this collision, and the "points and bends" practice should not have been a complicating factor. Both pilots followed the

"points and bends" local practice. The pilot of the Midwest Cities indicated that he had crossed from Point Michel to Pointe a La Hache, and the other pilot stated he was favoring the bends, or the general channel line shown on the U.S. Army Corps of Engineers' "Flood Control and Navigation Maps of the Mississippi River." No other detailed instructions or recommended tracklines for upbound and downbound traffic are available to pilots on this heavily trafficked inland waterway system. Pilots must evaluate each meeting situation on the basis of the particular situation and, based on their own judgment, decide which rule applies, or if the "points and bends" practice should be followed. In this case, one or both of the pilots erred in evaluating the meeting situation. In spite of both pilots' knowing of the other vessel's movements prior to sighting each other, seeing the other vessel's navigation lights, sounding of whistle passing signals, detecting each other on radar, and favorable navigation conditions, they did not effect a safe passage.

The pilot of the African Star stated he sighted the green sidelight and two white lights of the towing vessel well on his starboard bow, favoring the west bank, and running parallel to it. The pilot of the Midwest Cities reported sighting the red sidelight and range lights of the African Star on the tug's port bow, indicating to him that she was in midriver. This statement is directly opposed to that of the pilot of the African Star. In addition, two pilots on other vessels stated the Midwest Cities was favoring the east bank just prior to the collision. The fact that the African Star cut into the port side of the lead barge and at a substantial angle, even after the right rudder movement, makes it difficult to account for the green light on the tow being visible to African Star personnel.

Neither pilot slowed his vessel, or took evasive measures until the vessels were in extremis. The methods of conveying their intentions prescribed by the Inland Rules of the Road did not succeed in this case. Whistle signals and the target aspect of the navigation lights should have alerted the pilots of these vessels carlier that one vessel was planning a port-to-port passage, the other a starboard-to-starboard, had both pilots been more attentive. The lack of a common radiotelephonic frequency on the two vessels precluded the pilots from reaching a passing agreement by radio.

Both pilots believed that the collision occurred at Mile 46 AHP, approximately in mid-river. This is difficult to reconcile with the statement of two other pilots that the *Midwest Cities* was favoring the east bank. Prior to the collision, the tow turned right, yet the sunken *Intercity No. 11* grounded on the west bank. One explanation which could account for this is that the *African Star* went to the east of midchannel when it put on left rudder, and the *Midwest Cities* backed full to try to break loose from the burning *Intercity No. 11* and was backing towards the west bank for approximately 1 minute before the port wire was cast off or parted. The transverse momentum of this barge across the river, combined with the river current, probably accounts for the position of the grounded barge 700 feet off the west bank.

The apparent failure of bridge personnel on the African Star to hear the Midwest Cities' one-blast whistle signal has no satisfactory explanation. With the wind following the towing vessel, a lookout posted on the bow of the African Star, and the doors on the bridge open, the whistle signal of the Midwest Cities should have been audible. The pilot on the Midwest Cities heard the African Star's whistle signals in spite of a headwind and relatively higher noise level common to smaller dieselpropelled vessels. Moreover, the towing vessel was equipped with an amber-colored whistle signal light which should have been visible for 1 mile. The bow lookout on the African Star testified he heard his vessel sound one blast of the whistle which was answered immediately by one blast from the Midwest Cities. He further stated that both vessels repeated these one-blast signals, but he did not report this to the bridge, nor did he report his initial sighting of the tow's red and white navigation lights. He did not recall hearing any two-blast whistle signals from the African Star.

This case illustrates the fact that whistle signals are not of themselves a reliable means of communicating vessels' passing or turning intentions. Voice bridge-to-bridge radiotelephonic communications capability on a uniform operational frequency would probably have prevented this tragedy. Radio affords instant information and the opportunity to assent or object to the passing proposed by the vessel initiating the communication. Other advantages are that it is reliable day or night, and even when vessels are not in sight of each other, a safe passage can be arranged by correct interpretation of radar information. The Safety Board has previously noted the need for legislation requiring bridge-to-bridge radiotelephonic communications on a common frequency, in the report of the collision of the M/V Alva Cape and SS Texaco Massachusetts, and in our reports of special studies of "Collisions of Radar-Equipped Merchant Ships," adopted December 18, 1968, and "Towing Vessel Study," adopted August 29, 1969.

The Safety Board believes that the pilot of the African Star should have sounded the danger signal, and slowed or stopped his vessel as soon as he did not hear a reply to his two-blast whistle signal. Closer surveillance of the other vessel's movements would have alerted both pilots earlier to the potential for collision, and would have enabled them to take evasive action.

This accident points up again the uncertainties and difficulties which are experienced in applying the Inland Rules of the Road to arrange a safe passing. Arranging for passing requires the effective use of two modes of communication (visual in both directions and audible in both directions) plus the exercise of correct judgment. Failure of one of the two modes of communication, neither of which has an effective backup, can create a situation in which one or more persons must estimate correctly the intentions of others. In this accident, there was a lack of agreement before the accident which resulted in the collision. The testimony of the pilots during the investigation regarding the situation prior to the accident implies a failure of both communication modes.

At the 11/2-mile distance between the vessels at first sighting and with the relative closing speed of 22 knots, the time before passing was approximately 246 seconds. The initiation of the two-blast whistle signal by the pilot of the African Star and the awaiting of a similar response would have consumed about 30 seconds, including about 16 seconds for sound transmittal. The left rudder application, swinging, and return of the rudder to amidships would have required at least another 30 seconds. When the pilot of the African Star became uncertain, it would have required about 10 to 15 seconds for him to evaluate the situation using radar. After stop was rung on the engine order telegraph, evidence is that another 60 seconds passed before full astern was ordered and about 10 seconds would have been required to obtain full reverse thrust. The collision occurred approximately 120 seconds after stop was rung, and the Coast Guard estimated the relative speed at about 10 knots at collision. Thus, very little time was available for reverse thrust after stop was ordered. These response times are not unusual.

It is not possible to reconstruct the time sequence from the evidence, but it is apparent that, at this relative approach speed of 22 knots, the amount of time available in which to realize any error of visual analysis and correct it or to resolve a disagreement, was very limited. The Inland Rules of the Road do not directly provide solutions to the problems that may be met in following them, nor do they insure that collision can always be avoided by stopping short of an object ahead. It is clear, however, that one of the methods of negotiating a passing with reduced risk, when visual contact and whistle signals alone are to be relied upon, is to reduce speed as a partial compensation for the delays encountered when this system is used.

In this collision, resulting in a major fire and explosions, the most likely source of ignition of the highly volatile crude oil on *Intercity No. 11* was the sparks produced by the shearing of the barge by the bow of the *African Star*. There is also a possibility that the electric wiring for the barge lights was shorted and produced sparks. The rapidity with which the fire spread on the river and on board the *African Star* is attributed to the series of explosions on the *Intercity No. 11* which sprayed burning oil over the bow of the ship. The wind blew this blanket of flame down on the *African Star*. The combustibles on deck, and later in the holds, continued to burn after the burning spray of oil had subsided. Fighting this fire was hampered by the burning of a number of deck fire hoses. The intensity of the heat is evidenced by the melting of the aluminum containers stowed on the main deck. Later firefighting efforts by other than ship's crew were hampered by lack of information on the location and properties of hazardous materials stored in the containers and in the holds.

Intense fire and heavy choking smoke made efforts of personnel to escape from the vessel difficult. Most of the crew and passengers were in their quarters when the fire occurred, and the passageways outside their accommodation spaces were impassable. Some managed to get out on deck through portholes and were rescued. The fire also interfered with the lowering of the lifeboat and inflatable liferaft, the covers of which were aflame. Burning oil on the water surrounding the vessel prevented personnel from jumping overboard to get away from the burning vessel. It was fortunate that this burning oil was not located in an area contiguous to shore facilities handling hazardous materials, or a catastrophic casualty might have developed ashore.

The rescue operations were timely and well coordinated. Helicopter evacuation of the badly burned victims hastened their medical treatment. The action of the Plaquemines Parish Sheriff, Port Sulphur Hospital, and U.S. Public Health Service in New Orleans is the result of a commendable example of prompt contingency planning and operations.

Firefighting by the African Star crew controlled the fire until the Coast Guard vessels, the fire truck on board the ferry, and New Orleans fireboat arrived. The early firefighting efforts probably prevented the complete gutting by fire of the African Star.

PROBABLE CAUSE

The National Transportation Safety Board finds that the probable cause of this casualty was the failure of the pilots of the African Star and the Midwest Cities to reach agreement for a safe passing. The pilot of the African Star interpreted the meeting to require a starboard-tostarboard passing whereas the pilot of Midwest Cities thought it required a port-to-port passing. Contributing to the cause was (a) the lack of a common radiotelephonic frequency on the two vessels, and (b) the failure of both pilots to keep the other vessel's movement under closer surveillance and to slow or stop and take evasive action when no agreement for passing was reached.

The fire and subsequent explosions were caused by sparks generated by the shearing of the *Intercity No. 11's* steel side and deck by the bow of the *African Star*. Rapid spread of the fire on the *African Star* is attributed to the wind's blowing the burning oil over the bow of the *African Star*, and the abundance of combustibles on deck.

The many fatalities and injuries sustained on board the African Star were due to the rapid spread of fire and heavy smoke in living spaces, and burning oil surrounding the vessel, precluding personnel from jumping overboard.

RECOMMENDATIONS

The National Transportation Safety Board concurs in the need for early enactment of Federal legislation to require commercial vessels operating on the navigable waters of the United States to have the capability of voice bridge-to-bridge radio communications, on a common navigational safety frequency, as proposed by H.R. 6971 and S. 1240. The Board has also supported the need for enactment of Federal legislation requiring the licensing of all persons in charge of the navigation of towing vessels by the Coast Guard (H.R. 13987).

The Safety Board also recommends that:

1. The Coast Guard, Army Corps of Engineers, and Coast and Geodetic Survey consider: Including in the Coast Pilot or other appropriate navigational guide, information for the inland waterways on the "points and bends" custom and its effect on 33 U.S.C. 203 (Rule I) and 33 U.S.C. 210 (Article 25), the narrow channel rule, and other navigational information useful in navigating these waters; and the need for clarification of these rules in the proposed "United States Nautical Rules" (H.R. 214).

2. The Coast Guard consider amending the regula-

tions for cargo vessels to require manually operable air ports not less than 16 inches in diameter, or kickout panels, to provide an additional means of escape from berthing compartments located above the main deck. (This recommendation was previously made for tank vessels in the *Gulfstag* report dated May 29, 1968.)

3. The Coast Guard study the need for fire-resistant lifeboat and inflatable liferaft covers, and fire hoses.

4. The Coast Guard consider regulations requiring that hazardous cargo manifests be located in specified and accessible locations on all cargo vessels.

By the National Transportation Safety Board: Adopted this 23rd day of September 1970:

> /s/ JOHN H. REED, Chairman.

/s/ OSCAR M. LAUREL, Member.

/s/ FRANCIS H. MCADAMS, Member.

> /s/ LOUIS M. THAYER, Member.

/s/ ISABEL A. BURGESS, Member.

NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 6–70 28 AUGUST 1970

Subject: Fixed Fire Extinguishing Systems for Use in Galley Ventilating Equipment

PURPOSE

The purpose of this circular is to inform interested parties that fixed fire extinguishing systems for galley ventilating protection may be installed in accordance with the following instructions.

BACKGROUND

A ship's galley offers a natural environment for the production of fire since necessary elements of combustion are present; heat, fuel, and oxygen. Casualty files show that fires in galley units are often complicated by the fact that the fires extend into the galley ventilating equipment. This is an area that is difficult to reach in order to effect extinguishment.

DISCUSSION

There are three major types of fixed fire extinguishing systems for use in galley ventilating equipment. They are:

- a. Dry Chemical
- b. Carbon Dioxide
- c. Antifreeze

Dry chemical extinguishes fires by means of its inhibiting chemical interaction with the combustion process. Carbon dioxide excludes oxygen and the antifreeze system dispenses a liquid which turns cooking fat into soap by a process of saponification rendering it nonflammable. Each of the devices has inherent advantages and disadvantages, however, all are efficient devices when properly installed. The three types of devices are capable of manual and/or automatic operation.

ACTION

A fixed fire extinguishing system designed for use in galley ventilating equipment which is listed for such use by Underwriters' Laboratories, Inc., Chicago, Ill., will be permitted for installation on board U.S. vessels. Installation shall be made in accordance with the laboratories listing and labeling requirements and the manufacturer's recommended procedures. The list of acceptable systems and their design parameters may be found in the Underwriters' Laboratories, Inc. Fire Protection Equipment List. Engineered CO_2 systems that are currently approved by the Coast Guard may also be installed.

Approval for each installation shall be on a vessel-byvessel basis. Plans should be submitted to the appropriate U.S. Coast Guard District, Merchant Marine Technical Branch for review.

nautical queries

Q. Before clean ballast is discharged into coastal waters from a tankship, what precautions should be taken with regard to the cargo and ballast piping system?

A. Flush the lines from the seacocks into one or more tanks as required at the end of the cargo piping system away from the pumproom for about 10 minutes to remove any oil or sludge they may contain.

Q. During cargo transfer operations on tank vessels, what precautions should the deck officer-incharge take to prevent any accidental deck spills which might occur from running overboard?

A. Deck scuppers should be plugged except when water is being used to cool decks in which case plugs shall be readily available. Absorbent material, such as sawdust, should be readily available for cleaning up spills.

Q. If you have a spill on deck while transferring an oil cargo on a tanker, what should you do?

A. Stop the transfer of oil, close all tanks, put out all fires, call terminal fire and safety department if available, run out ship's fire apparatus, bail up oil with nonsparking bailers, and clean up decks with absorbent material before starting transfer of oil again.

Q. While in charge of loading bulk oil, you notice an excessive amount of oil on the water near your vessel. What should you do?

A. Stop the transfer of oil, notify the terminal superintendent, and see that Government authorities including the Coast Guard are notified, search the vessel for leaks and stay shut down until the source of trouble is located and danger has been eliminated. All possible means must be employed to recover oil, and every effort made to clean up the damage.

Q. List four hazardous circumstances during which loading or discharging of bulk liquid cargo on a tanker should be stopped.

A. Any four hazardous circumstances:

(a) Severe electrical storm is in progress.

(b) Vessel or dock in the vicinity is on fire.

(c) Cargo hose begins leaking.

(d) Spill of cargo occurs.

(e) Vessel comes alongside tanker.

(f) Tanker surges excessively.

(g) Cargo valve jams.

(h) Hose gets pinched between vessel and dock.

Q. Briefly describe the extent of the waters where the discharge of oil and oily mixtures is prohibited by the Oil Pollution Act, 1961.

A. The Oil Pollution Act, 1961, prohibits the discharge of oil and oily mixtures in sea areas within 50 miles of any land and in several parts of the world such discharges are prohibited even further from land.

Q. What is the meaning of the term "oil" as used in the Oil Pollution Act, 1961?

A. The term "oil" means crude oil, fuel oil, heavy diesel oil, and lubricating oil.

Q. Into which waters does the Refuse Act of 1899 prohibit the dumping of oil and refuse?

A. The Refuse Act of 1899 applies to all navigable waters of the United States (and their tributaries).

Q. Into what waters does the Water Quality Improvement Act of 1970 prohibit the discharge of oil?

A. The Water Quality Improvement Act of 1970 prohibits the discharge of oil into the navigable waters of the United States and into the water of the contiguous zone (i.e., U.S. coastal waters).

Q. Briefly describe the "load on top" method used to minimize pollution of the sea by oil.

A. Tank washings are usually collected in an after cargo tank designated as a slop tank and the water is settled out and then discharged. The oil residue is either pumped to a shore facility if available, or as in the load-on-top technique the new oil cargo (having the same chemical characteristics as the residual oil) is pumped on top of the residual oil, and this tank is then topped off.

Q. Briefly describe the precautions necessary to prevent water pollution when polluted ballast is discharged to a shore facility or barge from a tankship.

A. Sea valves and stern discharge valves should be checked to ascertain that they are tightly closed and lashed. All necessary valves in the pumproom and on deck should be set for discharging. After the hoses are properly connected and when all lines are set and ready to start discharging and shore personnel have been contacted to make certain they are ready to receive the ballast the discharge valves may be opened and pumping started slowly until it is ascertained that the shore lines are clear.

Q. Briefly state what antipollution measures you should attend to after commencing ballast operations on a tanker.

A. When ballast is started, all tanks should be inspected to insure that only the tanks intended as ballast tanks are receiving water. The same attention and care should be exercised in filling ballast tanks that is given to topping off tanks when loading cargo.

MERCHANT MARINE SAFETY PUBLICATIONS

The following publications of marine safety rules and regulations may be obtained from the nearest marine inspection office of the U.S. Coast Guard. Because changes to the rules and regulations are made from time to time, these publications, between revisions, must be kept current by the individual consulting the latest applicable Federal Register. (Official changes to all Federal rules and regulations are published in the Federal Register, printed daily except Sunday, Monday, and days following holidays.) The date of each Coast Guard publication in the table below is indicated in parentheses following its title. The dates of the Federal Registers affecting each publication are noted after the date of each edition.

The Federal Register will be furnished by mail to subscribers, free of postage, for \$2.50 per month or \$25 per year, payable in advance. The charge for individual copies is 20 cents for each issue, or 20 cents for each group of pages as actually bound. Remit check or money order, made payable to the Superintendent of Documents, U.S. Government Printing Office. Washington, D.C. 20402. Regulations for Dangerous Cargoes, 46 CFR 146 and 147 (Subchapter N), dated January 1, 1970 are now available from the Superintendent of Documents price: \$3.75.

CG No.

TITLE OF PUBLICATION

- Specimen Examination for Merchant Marine Deck Officers (7-1-63). 101
- Rules and Regulations for Military Explosives and Hazardous Munitions (5–1–68). F.R. 6–7–68, 2–12–69, 10–29–69. 108
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OF COURSE-OUR RECOMMENDATION IS NOT TO GET CAUGHT IN THIS SITUATION IN THE FIRST PLACE.)