

NATIONAL TRANSPORTATION SAFETY BOARD WASHINGTON, D.C.

FOR RELEASE: 6:30 P.M., E.D.T., MARCH 2, 1976

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ISSUED: March 2, 1976

Forwarded to:

Admiral Owen W. Siler
Commandant
U.S. Coast Guard
Washington, D.C. 20590

SAFETY RECOMMENDATION(S)

M-76-1 thru 10

In 2 June 1973, the outbound SS C.V. SEA WITCH lost steering control in New York harbor and struck the anchored tankship SS ESSO BRUSSELS. The ensuing fire caused 16 deaths, one injury, and extensive property damage. In addition, nearby beaches were polluted.

The investigation of the collision showed that a mechanical failure had occurred in the steering control system. Federal regulation 46 CFR 58.25-55 requires that two separate and independent steering control systems shall be provided for controlling the steering gear from the pilothouse when the alternative steering means is not located on the after weather deck. The Coast Guard approved the steering system on the SEA WITCH even though it had two separate and independent control systems only up to the two rotary hydraulic power units in the steering gear room. From that point on, the control was a single channel system. It was in this section that the failure occurred.

Although this mechanical failure in the steering control system could not be bypassed from the bridge, the emergency steering station in the steering gear room could have provided immediate and full steering control. However, vessels entering or leaving the harbor normally do not man this station. Also, these vessels do not have established drills or alarms to prepare for the manning of the emergency steering station on short notice.

Numerous mechanical failures on the SEA WITCH's steering system were not reported to the Coast Guard. This is because the Coast Guard does not require failures to be reported when the repair costs are below \$1,500. Also, a failure is not reported if it does not result in a "near accident" and its repair is considered low cost because the failure is not regarded as having affected the seaworthiness of the ship. However, the reliability of a steering system can be measured only by how often it fails, and this cannot be determined if some failures are unreported. Without these reports, faulty systems cannot be identified and corrected.

Even a reliable steering system is useless when the ship's power is lost. Like other vital systems aboard ship, the steering system should be supplied automatically from the emergency generator when normal power is lost.

Except for some instruction book procedures provided by the manufacturer of a portion of the steering gear, the crew of the SEA WITCH had no established emergency procedures to guide them when steering control was lost. The master applied these instruction book procedures without success. There were other means which could have been applied concurrently to bring the ship under control, but they were not specified emergency procedures. If these other means had begun as soon as steering control was lost, the collision might have been prevented.

After steering control was lost, the danger of collision did not become evident immediately. When it did become evident, the ship was going too fast to prevent the collision. Reliance on the anchor to prevent collision in such a situation is unjustified because the anchor may not drop, may drag excessively, or the anchor gear may fail from the stresses due to the high speed.

If the bow of the SEA WITCH had not penetrated the hull of the ESSO BRUSSELS, there would have been no fire, pollution, or loss of life. Conventional bows such as that of the SEA WITCH are dangerous because of their unnecessary axial strength, which exceeds normal operating requirements. An analysis, performed for the Safety Board by a firm specializing in marine systems' analysis and design^{1/}, showed that a ship's bow can be designed so that if it collides with another ship at a reasonable speed, it will not penetrate the other hull and it will not damage itself beyond the collision bulkhead. This would provide collision protection against any mechanical or human failure. In addition to the safety benefits, tankship operators probably will realize economic benefits if such a bow design is adopted widely, because the defensive design required for the tankships could be reduced.

This accident and past accidents demonstrate that it is difficult to reconstruct accurately the sequence of events which lead to a casualty. There is a need for automatic recording devices which will preserve vital navigational information aboard oceangoing vessels. Such devices may also improve safety by performing the routine logging tasks which sometimes distract the deck officers.

The Marine Board of Investigation made two recommendations which the Safety Board had issued previously to the Coast Guard. Although the Coast Guard recognizes the need for these improvements, the Safety Board's initial recommendations have been only partially implemented. For example, the Coast Guard has made little progress to require each life preserver to be equipped with a battery-powered light. The Marine Board of Investigation repeated this recommendation.

^{1/} Conceptual Design of a Non-Penetrating Ship's Bow
by George G. Sharp, Inc.


The second recommendation made by the Marine Board of Investigation which the Safety Board previously issued to the Coast Guard dealt with the need to prepare emergency contingency plans to respond to catastrophic accidents involving hazardous materials for those waterways which carry large quantities of these materials. The Coast Guard concurred with this recommendation in November 1972. However, the Commandant's current response concerning the use of conferences, seminars, and critiques for this purpose in lieu of an organized written plan with commitments by the participants is not responsive to the original Safety Board recommendation.

Therefore, the National Transportation Safety Board recommends that the U.S. Coast Guard:

1. Revise its interpretation of 46 CFR 58.25-55, which requires separate and independent steering controls, to prevent the use of a single control path up to the steering power units as was done on the SEA WATCH. (M-76-1) (Class II, Priority Followup)
2. Establish a requirement for oceangoing vessels in designated restricted waters such as New York harbor to have the emergency steering station manned. This also should apply to foreign vessels. (M-76-2) (Class II, Priority Followup)
3. Require all steering failures aboard U.S. oceangoing vessels to be reported to the Coast Guard. Such failures aboard foreign vessels also should be reported if the failure occurs in U.S. waters. (M-76-3) (Class II, Priority Followup)
4. Require that the emergency generator on future U.S. vessels provide power to the steering gear upon loss of a ship's normal electric power. (M-76-4) (Class II, Priority Followup)
5. Require all U.S. oceangoing vessels to establish written emergency procedures and alarms for loss of steering control. Emergency drills for loss of steering control should be required and logged. (M-76-5) (Class II, Priority Followup)
6. Include, as part of its speed limit stipulations for large vessels transiting New York harbor, a requirement that any vessel which loses steering control shall immediately stop or slow, and anchor as soon as it is safe to do so. (M-76-6) (Class II, Priority Followup)
7. Initiate research to develop a technical guide for the design of nonpenetrating ships bow. The scope of protection sought as to vessel types and collision speeds should be determined by risk analysis, but should not be less than that which would protect typical modern tugs in collisions with similar vessels at a speed of 6 knots. (M-76-7) (Class III, Long-Term Followup)

8. Require the installation of an automatic recording device to preserve vital navigational information aboard oceangoing tankships and containerships. (M-76-8) (Class III, Long-Term Followup)
9. Expedite implementation of the Safety Board's 1972 recommendation to prepare emergency contingency plans to respond to catastrophic accidents involving hazardous materials for those waterways which carry large quantities of these materials. The contingency plan for New York harbor should be given priority. (M-76-9) (Class II, Priority Followup)
10. Expedite implementation of the Safety Board's recommendations to require each life preserver to be equipped with a battery-powered light. (M-76-10) (Class II, Priority Followup)

REED, Acting Chairman, THAYER, and BURGESS, Members, concurred in the safety recommendations. McADAMS and HALEY, Members, concurred and dissented.


By: John H. Reed
Acting Chairman

THESE RECOMMENDATIONS WILL BE RELEASED TO THE PUBLIC ON THE ISSUE DATE SHOWN ABOVE. NO PUBLIC DISSEMINATION OF THE CONTENTS OF THIS DOCUMENT SHOULD BE MADE PRIOR TO THAT DATE.