

Log M-384C



NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D.C. 20594

Safety Recommendation

Date: June 25, 1993

In Reply Refer To: M-93-30 through -33

Mr. John Olsen
Chairman
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On August 7, 1992, the United Kingdom passenger vessel RMS (Royal Mail Ship) QUEEN ELIZABETH 2 (QE2) was outbound in Vineyard Sound, Massachusetts, when the vessel grounded about 2 1/2 miles south of Cuttyhunk Island. No injuries or deaths resulted from this accident. However, damage was significant; temporary and permanent repairs cost about \$13.2 million. In addition, the total revenue lost for the period before the vessel returned to service on October 2, 1992, was estimated at \$50 million.¹

As a result of its investigation of this accident, the Safety Board is making recommendations to Cunard concerning improving communication between pilots, masters, and other deck officers; providing squat information on board vessels; conducting safety orientation briefings for passengers boarding vessels at intermediate ports; and improving safety measures for disabled passengers.

¹For more detailed information, read Marine Accident Report--*Grounding of the United Kingdom Passenger Vessel RMS QUEEN ELIZABETH 2 Near Cuttyhunk Island, Vineyard Sound, Massachusetts, August 7, 1992* (NTSB/MAR-93/01).

The Safety Board believes that in this accident, a critical need existed for improved communication between the pilot, the master, and the other crewmembers on the bridge. The master had apparently made incorrect assumptions about the pilot's intentions, and the pilot saw no need to inform the master about what he actually planned to do. Although the pilot expressed full confidence in the ability of the officers on the bridge to perform navigational tasks and was aware that the second officer was monitoring the ship's progress and reporting that information to the master, the pilot still opted to pilot by his own methods rather than following the courses plotted by the navigator. The master stated that he assumed that the pilot was going to follow the reverse of the inbound course. Thus, the navigation of the vessel as understood by the pilot was not communicated to the master or the bridge watch.

Evidence from the investigation also indicates that the master did not fully understand how the pilot had planned to get to his debarkation point or that the pilot planned a course change at the "NA" buoy. The Safety Board believes that had adequate communication been established between the master and pilot, the master would have told the pilot of his preference to remain on a course that passed Brown's Ledge to the south. Moreover, the pilot probably would have explained his intention to stay north of the shoals near Brown's Ledge, and he and the ship's officers would have discussed the implications for safety in returning or not returning to the base course. Had the pilot and the ship's officers discussed the ship's course either immediately following the turn at the "NA" buoy or during a predeparture pilot/master conference, the factors increasing the risk of striking bottom would have become apparent.

The Safety Board found that another factor contributing to the accident was the lack of information aboard the QE2 about how speed and water depth can affect the ship's underkeel clearance, or squat. Although the pilot and master of the QE2 were generally aware of the phenomenon of squat, they testified that they had expected no more than 2 feet of squat, whereas the actual squat of the QE2 was probably 4.5 to 8 feet. Most mariners would probably agree with the master and pilot of the QE2 that a 2-foot allowance for squat was typical because most mariners' experience with squat is based on operating vessels in restricted waters, where vessels usually proceed at speeds of 10 to 12 knots or less. Information regarding the unusually large squats experienced by vessels at high speeds does not receive widespread distribution outside the community of hydrodynamic researchers.

The Safety Board believes that had the master and the pilot been provided with information by the vessel operators about the large squat likely in shallow waters, they may have chosen a route through deeper water or proceeded at a slower speed, thereby avoiding this accident. The master and the pilot could have benefitted immensely from the knowledge that their rule-of-thumb squat allowance of 2 feet could be exceeded by more than 300 percent during the QE2's transit through Vineyard Sound. Such information would have provided them with the necessary knowledge for making safe decisions during the master/pilot conference. The Safety Board concludes that the lack of information available on the QE2 about its squat characteristics caused the master and pilot to overestimate the vessel's underkeel clearance.

Implementation of International Maritime Organization (IMO) Resolution A.601(15), "Provision and Display of Maneuvering Information on Board Ships," would remedy the lack of squat information available to mariners. The Resolution calls for squat only to be estimated; this can be accomplished by using the empirical formulas and experimental data developed by researchers over the past 20 to 30 years. Most of this information is readily available in the public domain and can be easily utilized by naval architects. Most of the other information required by the IMO Resolution pertains to ship maneuvering characteristics that are routinely obtained during shipyard delivery trials conducted for new or modified vessels. The Safety Board believes that implementation of the Resolution will not overly burden the marine industry, and that the safety benefits of implementing the Resolution would far outweigh the minimal effort involved in adding the squat information to the maneuverability information already available.

During its investigation of this accident, the Safety Board also found deficiencies in shipboard emergency preparedness.

For instance, the passengers who boarded the QE2 at Halifax did not have the advantage of participating in a lifeboat drill that those passengers who boarded the vessel at the commencement of the cruise in New York had. The Halifax passengers' emergency briefing consisted of being made aware of the emergency instructions posted in their accommodations by their room stewards. Because an emergency can occur at any time after the voyage commences, passengers boarding a vessel at intermediate ports should also receive comprehensive safety and emergency instructions by qualified vessel personnel. This lack of instruction in emergency procedures could have serious consequences if an emergency evacuation were to occur, especially late at night. The Safety Board concludes that the passengers who boarded the QE2 at Halifax should have been given a comprehensive briefing or an emergency drill.

Additionally, although the difficulties experienced by disabled passengers were not a major problem in this accident, they illustrate the need for additional precautions to prepare disabled passengers for emergencies. For instance, one hearing-impaired passenger responding to the Safety Board's survey complained that she could not hear the public address system. When she attempted to gain information from the television in her room, she found that it was not equipped with closed caption. However, according to Cunard, the QE2 could have provided closed-caption programming through the ship's television system.

Hearing-impaired passengers should not be excluded from obtaining vital safety or emergency information. More than 28 million Americans have a hearing loss and 80 percent of those affected have permanent, irreversible hearing damage. In addition, more than one-third of the U.S. population has a significant hearing impairment by age 65, according to statistics compiled by the National Institute on Deafness and Other Communication Disorders. The population of older, potentially hearing-impaired passengers could be sizable. A statistician from the Cruise Line International Association stated that over a 5-year period, on average, 36 percent of the passengers traveling on cruise vessels were at least 60 years old.

The Safety Board believes that hearing-impaired and other disabled passengers should have a means of obtaining emergency information to prevent the possibility of not being notified of a vessel emergency such as fire, sinking, or evacuation. In light of the potential problems revealed by this investigation, the Safety Board concludes that disabled passengers who travel by ship require additional safety precautions to advise and prepare them to act in an emergency.

Therefore, the National Transportation Safety Board recommends that Cunard Lines, Ltd.:

Require that after a pilot boards one of your vessels, your masters conduct a conference that includes a discussion between the pilot and other relevant deck officers of the proposed route, including courses, speeds, squat, unique maneuvers, and danger areas. (Class II, Priority Action) (M-93-30)

Implement IMO Resolution A.601(15), "Provision and Display of Maneuvering Information Aboard Ships," paying particular attention to the provision of squat information for the QUEEN ELIZABETH 2 and other deep-draft, high-speed vessels in your fleet. (Class II, Priority Action) (M-93-31)

Require that all passengers boarding vessels at intermediate ports during a voyage receive comprehensive safety and emergency instructions by qualified crewmembers soon after boarding. (Class II, Priority Action) (M-93-32)

Provide a suitable means for communicating or relaying passenger advisories, instructions, and emergency alerts to disabled passengers. (Class II, Priority Action) (M-93-33)

Also, the Safety Board issued Safety Recommendations M-93-17 through -26 to the U.S. Coast Guard, M-93-27 to the Department of Transportation, M-93-28 and -29 to the National Oceanic and Atmospheric Administration, and M-93-34 to State pilot commissions. The Safety Board is also reiterating Safety Recommendations M-91-6 and -28 to the U.S. Coast Guard.

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility "to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is vitally interested in any action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter. Please refer to Safety Recommendations R-93-30 through -33 in your reply. If you need additional information, you may call (202) 382-6850.

Chairman VOGT, Vice Chairman COUGHLIN, and Members LAUBER, HART, and HAMMERSCHMIDT concurred in these recommendations.

A handwritten signature in black ink, appearing to read "C. W. Vogt", written in a cursive style.

By: Carl W. Vogt
Chairman