



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: July 18, 2000

In reply refer to: M-00-6 and -7

Cruise Line Companies (list attached)

In this letter, the National Transportation Safety Board recommends that individual cruise line companies take action to address the following safety issue related to passenger ship fire safety: the lack of automatic local-sounding smoke alarms in crew and passenger accommodation areas. The Safety Board has issued related safety recommendations concerning the same issue to the International Council of Cruise Lines (ICCL) and to the U.S. Coast Guard. The ICCL has informed the Safety Board that it does not make recommendations to its membership and that it could not act in an advocacy role concerning this safety issue. The Coast Guard is pursuing a regulatory solution to the problem with the International Maritime Organization (IMO) to require automatic local-sounding smoke alarms on passenger ships. However, the Safety Board does not expect favorable IMO action in the immediate future. Therefore, these recommendations are being made directly to the cruise line operators.

The persistence of fires on board cruise ships operating from U.S. ports and the continued threat that even relatively small fires pose to crew and passengers in their quarters demonstrate a need for automatic local-sounding smoke alarms in crew and passenger accommodation spaces. Information supporting the recommendations is discussed below. The Safety Board would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendations.

The following recommendations are derived specifically from the previous recommendations made as a result of the Safety Board's investigations of fires aboard the passenger ships *Universe Explorer* and *Vistafjord* on July 27, 1996, and April 6, 1997, respectively. In each incident, an officer sounded the general alarm after receiving a fire alarm on the fire control panel on the navigation bridge. However, the time lapse between the fire breaking out and the sounding of the general alarm to warn passengers and crew allowed a dangerous amount of smoke to spread into living quarters. As a result, a total of 6 crewmen died, and 73 crewmembers and 4 passengers sustained injuries from smoke inhalation.

The first fire occurred on July 27, 1996, on the Panamanian flagged *Universe Explorer*, which was en route from Juneau to Glacier Bay, Alaska, with 733 passengers and 274 crewmembers. A fire in the main laundry activated a heat detector alarm on the fire control panel in the wheelhouse at 0258. The master ordered the general alarm sounded about 0305; however, dense smoke and heat already had spread upward two decks to the crew accommodation

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quarters. The *Universe Explorer* was not equipped with automatic local-sounding smoke alarms in the crew accommodation area. Five crewmembers died from smoke inhalation. Responders found the bodies of two crewmen in their staterooms and the bodies of three crewmen in the passageway. In addition, 67 crewmen and 2 passengers were injured; 27 people were admitted to the hospital, 5 with critical injuries. All crew injuries were a result of smoke inhalation.

The second fire occurred on April 6, 1997, on board the Bahamian passenger ship *Vistafjord*, which was underway from Fort Lauderdale, Florida, to the Azores with 569 passengers and 422 crewmembers. Shortly after 0100, the fire broke out in a storage room adjacent to the laundry. Although an alarm activated on the fire control panel in the wheelhouse, no automatic local-sounding smoke alarms were in the passenger or crew accommodation spaces. Even though the duty officer immediately sounded the general alarm, enough time had transpired from the ignition of the fire to allow heavy, black smoke to spread to the crew accommodation spaces where off-duty crew were sleeping. Survivors stated that the smoke filled the crew accommodation area to within 18 inches of the deck. One crewman testified that he and his roommate had to crawl on hands and knees toward an exit. He said that he was able to escape through a watertight door, but his roommate became disoriented and took a wrong turn. Emergency responders found the body of the disoriented crewman in another cabin. Autopsy results indicated that the cause of death was asphyxia from smoke inhalation. In addition to the one crewman who died, six other crewmembers and four passengers sustained injuries from smoke inhalation. Three passengers required hospitalization.

The fires on board the *Universe Explorer* and the *Vistafjord* were relatively minor and were brought under control and extinguished by on-board firefighting resources. In addition, both fires had started early in the morning when most people were asleep in their cabins. Further, all fatalities occurred in the crew accommodation area and resulted from smoke inhalation. The Safety Board is very concerned that the accommodation areas on passenger ships are not equipped to provide immediate local warning of the presence of smoke. Historically, most fire-related deaths do not result from burn injuries but from smoke inhalation. When a fire breaks out on board a vessel, early warning is essential for escape because exit routes are through narrow internal passageways with no natural lighting. Smoke from a fire builds quickly, obscuring artificial lighting and making exit signs and exits hard to find. The debilitating nature of dense smoke, which causes difficulty in breathing and blinding due to tearing, frequently causes panic in people at the very time when they most need to think clearly.

The *Universe Explorer* and the *Vistafjord* are typical of passenger ships on which detectors first sound an alarm in a central control center or in the pilothouse before a general alarm is sounded throughout the vessel. The crew and passenger accommodation spaces had no automatic local-sounding smoke alarms, thereby delaying the prompt notification of the smoke conditions and the need to evacuate. Having such a delay built into a fire alarm system does not afford the maximum margin of safety to those on board because it reduces available escape time. The 1992 amendments to the International Convention for the Safety of Life at Sea (SOLAS), 1974 required that cruise ships install smoke detectors in crew and passenger living spaces by October 1, 1997. However, the mandate did not require that the smoke detectors sound locally at the first indication of smoke.

The Safety Board believes that had automatic local-sounding smoke alarms sounded when smoke began to enter the accommodation areas, the victims in the *Universe Explorer* and the *Vistajord* accidents would have been alerted before conditions became life-threatening. Moreover, the number and severity of all injuries on the vessels may have been reduced. The fires in these cases originated close to crew berthing areas, which resulted strictly in crewmember fatalities and in crewmen sustaining most of the injuries. The number of passengers' injuries was limited to four. If these fires had started in areas closer to passenger accommodations, the absence of a timely alert could have resulted in multiple passenger deaths as well.

Nearly six million passengers boarded cruise ships from U.S. ports in 1999.¹ Fires continue to occur with troubling regularity on board passenger ships operating from U.S. ports; since the fires on board the *Universe Explorer* and the *Vistajord*, the cruise ships *Ecstasy*,² *Tropicale*,³ and *Nieuw Amsterdam*⁴ have all experienced fires on board. The occurrence of these fires underscores the need for automatic local-sounding smoke alarms in accommodation spaces, and the Safety Board is concerned for crew and passenger safety in light of the lack of automatic local-sounding smoke alarms. In the July 1998 fire on the *Ecstasy*, two crewmen became trapped by smoke, and both suffered smoke inhalation injuries before they were rescued.

In the most recent example, a fire broke out in a crew cabin on board the Netherlands flag passenger ship *Nieuw Amsterdam* on May 23, 2000, while the vessel was operating on a pleasure cruise in Glacier Bay. Although the fire was restricted to one deck, smoke from the fire progressed upwards through nine decks to the navigation bridge deck. The sleeping off-duty crewmen in the cabins near the fire were awakened and warned of the fire only after the quartermaster was dispatched from the navigation bridge to the scene to verify the existence of a fire. Further, a passenger suffered smoke inhalation injuries after leaving his cabin and entering a smoke-filled passageway. The passenger had returned to his cabin, which was two decks above the fire, to obtain his life preserver. He informed Safety Board investigators that the passageway outside his cabin was free of smoke when he entered his cabin but was filled with heavy smoke when he opened the cabin door to exit a few minutes later. He moved from his cabin along the passageway toward a known exit but, in an effort to find breathable air, was soon forced to crawl on his hands and knees. He could not see where he was going in the heavy smoke, became disoriented, and injured himself by colliding with the corridor bulkhead. Feeling his way along the corridor, he might well have succumbed to the smoke if he had not happened to bump into a crewman, who led him to safety. This passenger had received no warning that the passageway outside of his cabin was filling with smoke.

In response to Safety Board recommendations⁵ to the Coast Guard concerning automatic local-sounding smoke alarms on passenger ships, the Coast Guard submitted a proposal⁶ to the

¹ "As Orders Climb, Shares Wilt." Marine Log. May 2000.

² On July 20, 1998, off Miami, Florida.

³ On September 19, 1999, in the Gulf of Mexico.

⁴ On May 23, 2000, in Glacier Bay, Alaska.

⁵ Safety Recommendations M-97-39 and -40 were issued to the Coast Guard on April 29, 1997. These recommendations were classified "Open—Acceptable Response" on September 11, 1997. On June 22, 2000, the Safety Board requested further information from the Coast Guard about these two recommendations.

IMO that SOLAS chapter II-2 be amended to require automatic local-sounding smoke alarms to be required on passenger ships. The Coast Guard's proposal stated that the technology already exists to provide the local alarms, that most existing fire detection systems could be altered to accommodate local alarms at reasonable cost, and that automatic local-sounding smoke alarms would present a "tremendous improvement to life safety for passengers and crew." The Safety Board recognizes and appreciates the Coast Guard's efforts to effect regulatory change on the international level.

However, at the IMO meeting of February 25, 2000, the Coast Guard proposal was removed from the agenda without technical discussion. It had been opposed by the ICCL as well as the International Chamber of Shipping (ICS).⁷ The opposition, specifically that of the ICCL, focused on two propositions – false alarms and crowd management. The false alarm issue is a matter of independent concern from a safety standpoint. The ICCL position paper stated that "on a daily basis there are as many as 20 or more false alarms as a result of normal sensitivity of smoke detectors." The Safety Board believes that, if this figure is accurate, the incidence of false alarms indicates serious systemic problems that need to be corrected, regardless of the need for automatic local-sounding smoke alarms. Regarding the concern for crowd control, the ICCL paper alleges that automatic local-sounding smoke alarms will increase the risk of mass panic by passengers and impair effective crowd control by ships' crews. The ICCL cited a "worst case scenario" wherein an "improper and uncontrolled response by passengers . . . could cause panic, injury or death."

The Safety Board's recommendation to the Coast Guard called for local smoke alarms that would only sound in the immediate area where smoke is present and evacuation is vitally important. The recommendation did not envision the automatic sounding of the general alarm throughout the entire ship based upon the activation of a single smoke detector. The recommended local alarm could not realistically be expected to result in a mass panic situation. Since the alarm would also sound in the centrally located and continuously manned fire control station, the crew would be immediately informed of the activated alarm and would be able to launch an appropriate response without delay.

Furthermore, cruise passengers, especially those coming from the United States, are familiar with smoke detector alarms. They have them in their homes and in the hotels ashore in which they are guests. Such passengers would, in the Board's opinion, not be likely to panic just because a local alarm is sounding. Rather, they would probably investigate the source of the alarm, and, if they smelled or saw smoke, they would leave the area, which would be the correct action for them to take. If cruise vessel operators had doubts whether passengers would take this appropriate action, instruction concerning the proper course of action in the event of the activation of a local alarm could be included in the fire drill required to be held upon sailing.

⁶ "Fire Detection and Fire Alarm Systems on Passenger Ships." Maritime Safety Committee 71/20/5, dated January 4, 1999.

⁷ The ICS is an international trade association of ship owners' associations from maritime nations. It has consultative status at the IMO, and the ICS actively lobbies that organization on issues of concern to the international shipping community. The ICCL is a member of the ICS.

The National Transportation Safety Board and the Coast Guard agree that we will continue to pursue the matter before the IMO. However, in view of the continuing risks of death and injury from fire, the Safety Board believes that passenger ship operators should take it upon themselves to install automatic local-sounding smoke alarms in crew and passenger accommodation areas and not wait to be required to do so.

Therefore, the National Transportation Safety Board recommends that the Cruise Line Company (see attached list):

Without delay, install automatic local-sounding smoke alarms in crew accommodation areas on company passenger ships so that crews will receive immediate warning of the presence of smoke and will have the maximum available escape time during a fire. (M-00-6)

Without delay, install automatic local-sounding smoke alarms in passenger accommodation areas on company passenger ships so that passengers will receive immediate warning of the presence of smoke and will have the maximum available escape time during a fire. (M-00-7)

The Safety Board also issued safety recommendations to (see attached list) and the International Council of Cruise Lines. In your response to the recommendations in this letter, please refer to M-00-6 and -7. If you need additional information, you may call (202) 314-6170.

Chairman HALL and Members HAMMERSCHMIDT, GOGLIA, BLACK, and CARMODY concurred in these recommendations.

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Chairman

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