

NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D.C. 20594



Safety Recommendation

Date: July 26, 1993

In Reply Refer To: M-93-35 through -39

Admiral J. William Kime
Commandant
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The safety of passengers on board foreign-flag vessels that operate from U.S. ports has been a long-standing concern of the National Transportation Safety Board. As of June 1, 1993, about 137 foreign-flag passenger vessels were regularly operating from U.S. ports, and these vessels carry millions of U.S. passengers each year. The Safety Board considers the safety of these passengers a very important issue in its oversight responsibility.

The Safety Board recently completed a special investigation that revisits the survival factors issues addressed in the Safety Board's 1989 safety study, *Passenger Vessels Operating From U.S. Ports* (NTSB/SS-89/01). The resulting special investigation report¹ provides an update on the actions that have been taken in response to the recommendations that the Safety Board issued as a result of its 1989 study. The report also reviews accidents involving foreign passenger vessels operating from U.S. ports during calendar years 1990 and 1991 and focuses on safety improvements that are still needed in the areas of firefighting and emergency training, shipboard evacuation procedures, communications among crewmembers and between crewmembers and passengers, and life jacket stowage on board passenger ships.

As a result of this special investigation, the Safety Board is making recommendations to the U.S. Coast Guard concerning emergency and firefighting training standards, curricula, and drills and also concerning the feasibility of equipping passenger staterooms with personal protection breathing devices and emergency call systems.

¹For more detailed information, read Special Investigation Report--*Accidents Involving Foreign Passenger Ships Operating From U.S. Ports, 1990-1991* (NTSB/SIR-93/01).

The Safety Board regards crew firefighting training as the key element in shipboard fire safety. Because fires on board ships that do not meet the latest fire protection standards can quickly spread out of control, the margin for crew error is diminished on older ships. Even on new ships, comprehensive firefighting training for the ship's crew can be the difference between a small incident and a major fire.

Crew firefighting training was a major factor in several of the accidents discussed in this special investigation, including the February 20, 1991, fire on board the Norwegian passenger ship SOVEREIGN OF THE SEAS, a relatively new vessel outfitted with some of the latest fire safety technology.² In fighting the fire, none of the crewmembers wore the thermal protective clothing readily available to them. As a result, the heat from the fire repeatedly drove them from the fire scene, during which time the fire rekindled.

The Safety Board believes that if the crewmembers had been more thoroughly trained in shipboard firefighting procedures, they would have donned thermal protective clothing, which would have enabled them to withstand the intense heat and to extinguish the fire much sooner, resulting in less damage to the vessel.

In response to the need to improve crew firefighting training, the International Maritime Organization (IMO) published Maritime Safety Committee (MSC) Circular 544, *Fire Drills and On-Board Training*, in July 1990 to provide recommendations and guidance for conducting shipboard fire drills and on-board crew training. This circular urges vessel owners and operators to establish emergency procedures to "fight fires and deal with abandon ship emergencies, which should include all members of the crew...."

The guidelines and recommendations set forth in MSC Circular 544 provide a good overview of the type of fire and emergency training that is necessary for the crewmembers of passenger vessels. For instance, MSC Circular 544 recognizes that during a fire emergency, crewmembers not only may be called upon to fight fires but also to rescue passengers from smoke-filled spaces and to administer first aid and cardiopulmonary resuscitation. However, "recommendations and guidance" represent a lesser level of compliance than the Safety Board deems necessary to ensure proper crew firefighting training on foreign passenger ships operating from U.S. ports. The Safety Board believes that the safety of passengers requires mandatory certification of firefighting training and that the recommendations contained in MSC Circular 544 fail to provide for such certification. In addition, they do not contain detailed instructions concerning the extent of training that is necessary for each crewmember in each training area. Crewmembers who are assigned actual firefighting roles will require a different level and type of training from crewmembers who are not assigned such direct roles.

²Marine Accident Brief--*Fire on Board the Norwegian Passenger Ship SOVEREIGN OF THE SEAS, San Juan Harbor, San Juan, Puerto Rico, February 20, 1991* (NTSB DCA91MM023, adopted May 1, 1993).

The Safety Board concludes that training should be formalized so that all crewmembers possess a baseline level of proficiency necessary to assist passengers in an emergency. Crewmembers lacking such emergency training may not be able to take care of themselves when an emergency arises, let alone provide for the safety of the ship's passengers. The only preparation for emergencies that the majority of crewmembers currently receive comes as an incidental result of routine shipboard drills rather than through specific emergency training.

Cruise ship crews can be quite large; since the usual crew-to-passenger ratio on cruise ships is about 1:3,³ a large cruise ship carrying 1,000 passengers would have approximately 330 crewmembers. Newer vessels may carry more than 600 crewmembers.

The Safety Board believes that the Coast Guard should propose that the IMO establish international emergency training standards and develop curricula setting forth the basic level of emergency training that all passenger ship crewmembers should possess. Further, the Safety Board believes that cruise ship company management has the responsibility to ensure that crewmembers receive proper fire safety training and that the successful completion of such training should be certified to the satisfaction of flag State and port State authorities. This training should include basic instruction on fire prevention and firefighting, as well as basic training in assisting passengers in emergencies.

Once the baseline for firefighting training has been established, the Coast Guard should propose that the IMO establish additional training standards and curricula, following the guidelines and recommendations set forth in MSC 544, to develop an advanced, in-depth program for crewmembers whose primary responsibility is fighting shipboard fires. A recently released report by the General Accounting Office⁴ recommended similar improvements in firefighting training for crewmembers with firefighting responsibilities on board passenger ships. The Safety Board further believes that cruise ship companies should certify the successful completion of this training by crewmembers to the satisfaction of flag State and port State authorities.

In addition to training issues, the Safety Board also examined shipboard evacuation procedures and equipment in this special investigation.

Sometimes the difference between surviving and not surviving in a fire emergency is a matter of minutes. Fires, especially fires involving rubber, plastics, and many laminates, give off large volumes of toxic fumes, even on new ships. In the April 1990 SCANDINAVIAN

³*Lloyd's Ship Manager*, Lloyd's of London Press, Ltd., London, England, February 1992, p. S11.

⁴*Additional Actions Needed to Improve Cruise Ship Safety* (GAO/RCED-93-103), March 1993.

STAR fire,⁵ the inhalation of toxic fumes caused 148 of the 158 fatalities. If passengers can be protected from these fumes until rescue arrives, their chances of survival will be increased.

Although eliminating smoke and toxic fumes should be the ultimate goal in shipboard fire safety, the Safety Board is concerned that smoke and toxic fumes may never be completely eliminated. Therefore, the Safety Board considered additional methods to protect escaping passengers from exposure to smoke and toxic fumes during fires.

The Safety Board believes that sufficient advances have been made in the technology for personal protection breathing devices to merit further study regarding their possible use on board passenger ships. Escape from a shipboard fire may require passengers to transit long passageways and several decks. It could easily take several minutes for a passenger to follow a shipboard escape route, which may be filled with toxic smoke, to reach safety. Also, unlike shoreside hotel rooms, which commonly have exterior windows through which escape from fire may be made, many passenger staterooms have no external windows, and escape through portholes is impractical for persons trapped by fire. The Safety Board, therefore, believes that the Coast Guard should analyze the desirability and feasibility of equipping passenger staterooms with personal protection breathing devices that could be worn by passengers escaping from a smoke-filled environment.

In addition to the dangers posed to passengers by smoke and toxic fumes, the smoke and flames of a fire can trap passengers in their quarters. In the 1990 SCANDINAVIAN STAR disaster, for example, 99 of the 158 fatalities were found in their staterooms. In most of the passenger ship fires investigated by the Safety Board, the passengers were notified of the fire through announcements made over a public address system. In some instances, crewmembers ran through passenger areas pounding on passenger stateroom doors and calling for passengers to evacuate. Although this method of notification is usually effective in warning passengers of a fire and of the need to evacuate, it could not be relied upon if the passageways were already blocked by smoke and fire.

Shipboard rescue personnel need to know which passengers have been trapped as soon as possible because survival time may be extremely short. In most cases, this information becomes available only when passengers fail to show up for a roll call; by then, valuable time may have been lost. The Safety Board believes that the Coast Guard should analyze the desirability and feasibility of equipping passenger staterooms with an emergency call system by which trapped passengers may signal their plight. Since passenger staterooms on most modern passenger ships are already equipped with telephones, a possible solution would be to incorporate an emergency call system into the existing system.

⁵*The Scandinavian Star Disaster of 7 April 1990*, Norwegian Official Reports, Government Administration Services, Government Printing Service, Oslo, 1991 (NOR 1991:1 E).

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

Propose to the International Maritime Organization's Maritime Safety Committee that international emergency training standards and curricula be established setting forth the basic level of emergency training that all passenger ship crewmembers should receive and that cruise ship companies be required to certify to the satisfaction of the flag State and port State authorities the successful completion of such training. (Class II, Priority Action) (M-93-35)

Propose to the International Maritime Organization's Maritime Safety Committee that international standards and curricula for advanced firefighting training be established for passenger ship crewmembers responsible for fighting fires and that cruise ship companies certify to the satisfaction of flag State and port State authorities the successful completion of such training. (Class II, Priority Action) (M-93-36)


Propose to the International Maritime Organization's Maritime Safety Committee that more realistic crew emergency drills be required on passenger ships so that crewmembers will possess the specialized skills necessary to ensure passenger safety, including the skills needed to rescue passengers trapped in their staterooms. (Class II, Priority Action) (M-93-37)

Analyze the desirability and feasibility of equipping passenger staterooms with personal protection breathing devices that could be worn by passengers escaping from a smoke-filled environment. (Class II, Priority Action) (M-93-38)

Analyze the desirability and feasibility of equipping passenger staterooms with an emergency call system by which trapped passengers can signal their plight. (Class II, Priority Action) (M-93-39)

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 M-93-35 through -39 in your reply. If you need additional information, you may call (202) 382-6860.

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


By: Carl W. Vogt
Chairman