

MAIB SAFETY BULLETIN 1/2006

Fire on board the Bermuda registered cruise ship

Star Princess

on 23 March 2006

Issued April 2006

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This document, containing safety lessons, has been produced for marine safety purposes only, on the basis of information available to date.

The Merchant Shipping (Accident Reporting and Investigation) Regulations 2005 provide for the Chief Inspector of Marine Accidents to make recommendations at any time during the course of an investigation if, in his opinion, it is necessary or desirable to do so.

The Marine Accident Investigation Branch (MAIB) is carrying out an investigation into the fire on board the Bermuda registered cruise ship *Star Princess* on 23 March 2006. The MAIB will publish a full report on completion of the investigation.



Stephen Meyer
Chief Inspector of Marine Accidents

This bulletin is also available on our website: <http://www.maib.gov.uk>

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BACKGROUND

At 0309 (UTC+5) on 23 March 2006, a fire was detected on board the cruise ship *Star Princess*. The ship was on passage from Grand Cayman to Montego Bay, Jamaica, with 2690 passengers and 1123 crew on board. The fire is being investigated by the Marine Accident Investigation Branch (MAIB) on behalf of the Bermuda Maritime Administration, in cooperation with the United States Coast Guard (USCG), and the United States' National Transportation Safety Board (NTSB).

The cause of the fire has yet to be determined. However, the seat of the fire was on an external stateroom balcony sited on deck 10 on the vessel's port side. The fire spread rapidly along adjacent balconies, and within 10 minutes had spread up to decks 11 & 12 and onto stateroom balconies in two adjacent fire zones. It also spread internally as the heat of the fire shattered the glass in stateroom balcony doors, but was contained by the fixed fire-smothering system fitted in each of the staterooms. As the fire progressed, large amounts of dense black smoke were generated from the combustible materials on the balconies, and the polycarbonate balcony partitions. This smoke entered the adjacent staterooms and alleyways, and hampered the evacuation of the passengers. One passenger died as a result of smoke inhalation, and 13 others were treated for the effects of the smoke.

The fire was extinguished about 1.5 hours after it had started. The crew fought the fire with water hoses from adjacent external areas, and from internal alleyways. Difficulty was experienced in reaching the fire due to the construction and partitioning of the balcony areas. A total of 79 cabins were condemned after the fire, and a further 204 were either water or smoke damaged. The damaged area covered 3 vertical fire zones on 5 decks (**Figures 1, 2 and 3**).



Figure 1



Figure 2



Figure 3

ANALYSIS

Following the accident, it has been determined by practical tests that the materials at the seat of the fire were readily ignitable, and that the polycarbonate balcony divisions generated intense heat and copious amounts of dense black smoke as they burned (**Figure 4**).

The International Convention for the Safety of Life at Sea (SOLAS) is an internationally agreed convention governing the construction and safety of vessels at sea. SOLAS regulations, as included in Chapter II-2 *Construction-Fire protection, fire detection and fire extinction*, do not, currently, prescribe the combustibility of materials used on external balcony areas, as these are not included within the vessel's fire zones. Similarly, balcony areas on cruise ships are not required to have fixed fire detection or suppression systems, as would be the case in internal areas. Additionally, balcony areas are frequently difficult to monitor due to their inaccessibility. This accident clearly demonstrates the risk of a serious fire starting and quickly spreading in areas not covered by regulation.

The installation of balconies, similar to those on board *Star Princess*, has become increasingly common in modern passenger vessels. It is vital to ensure that the fire protection arrangements within a ship, such as zoning, are not undermined by lack of appropriate measures externally. Immediate action is therefore required internationally, to address the risk of fire in external areas such as balconies, and to stop the potentially catastrophic spread of any such fire.



Figure 4

ACTIONS TAKEN

The International Council of Cruise Lines (ICCL) has issued a safety notice (**Annex A**) to its members and other associations, identifying:

- a. Immediate actions to mitigate the risk until the medium term measures have been completed; and
- b. Additional actions to be undertaken within 3 months and 6 months, to provide longer term solutions in existing ships.

RECOMMENDATIONS

The Maritime Administration of the United Kingdom is recommended to:

- 2006/162** Submit a formal request to the forthcoming eighty-first session of the Maritime Safety Committee (MSC 81) of the International Maritime Organization (IMO) to:
- consider the issue comprehensively, with a view to urgently developing appropriate amendments to the 1974 SOLAS Convention, to address hazardous external areas of passenger ships, such as balconies, and ensure that they meet appropriate standards of fire protection, such as those currently applicable to internal areas of passenger ships;
 - in the interim, issue appropriate urgent guidance on fire protection of external areas of passenger ships, such as balconies.

Cruise lines and operators/managers of passenger vessels are recommended to:

- 2006/163** Take urgent action to comply with the measures identified in the ICCL Safety Notice attached at Annex A.

Flag States are recommended to:

- 2006/164** Urgently review the fire safety integrity of external areas of passenger ships on their Register, to ensure that the immediate and medium-term actions taken in the light of this Safety Bulletin are effective.



INTERNATIONAL COUNCIL
OF CRUISE LINES

April 13, 2006

SAFETY NOTICE

The purpose of this safety notice is to inform ICCL members and, to the extent feasible, other passenger vessel operators, of some of the preliminary indications from the recent balcony fire on the cruise ship STAR PRINCESS. Additionally, this safety notice also urges immediate action.

The investigation, being conducted by the UK's Marine Accident Investigation Branch (MAIB) (at the request of the government of Bermuda, the flag state of STAR PRINCESS) also includes representatives of the United States Coast Guard (USCG), the United States National Transportation Safety Board (USNTSB). The purpose of the investigation is to determine the cause of the fire. A full report from the MAIB will be available at a later date.

Early indications are that the fire originated on an exterior balcony and quickly spread to other balconies in three main vertical fire zones. The cause of the fire spread is unknown at this time, but the presence of combustible material in the balcony areas is considered to have been a major factor.

This notice is to alert ship owners and ship managers of the potential fire risk on external areas, particularly balcony areas, arising from the use of combustible materials. Such areas typically lack smoke/heat detectors, and difficulty of access potentially makes fire fighting in these areas problematic. These issues combine to raise the risk of high intensity fire spreading rapidly.

In the interim, having met with the investigative authorities concerned, ICCL offers the following safety guidance to the cruise line industry:

2111 Wilson Boulevard • 8th Floor • Arlington, Virginia 22201 (USA)
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Immediate Action

1. Immediately implement measures to counter the risk of this type of marine casualty such as:
 - a. Increase vigilance on all vessels with balconies where there may be a presence of combustible materials and the lack of detectors or sprinkler systems. In this respect, the provision of dedicated lookouts and additional fire patrols should be considered.
 - b. Review the crew's onboard training and response procedures to ensure that the ship's firefighting teams are prepared to respond to a fire occurring in the balcony area.
 - c. Advise passengers and crew not to leave towels and personal belongings on balconies when they are not in their rooms.
 - d. Instruct housekeeping staff to place personal articles left on balconies by room occupants back in the room during their last visit of the day to the guest room, and to observe balconies during other visits to the room.
 - e. Re-emphasize fire safety in communications to passengers, including the distribution of appropriate informational pamphlets.
 - f. Re-emphasize to passengers the need not to throw any items over a ship's side from balconies or other external areas...
 - g. Re-emphasize to passengers the hazards of not properly extinguishing smoking materials where smoking is authorized, and never to leave smoking materials unattended.
 - h. Re-emphasize to crew and passengers the hazards of using unauthorized heating elements such as electrical heating coils used in cups or mugs and open flames such as candles.

Additional Actions

2. Within three months, determine the areas at risk by carrying out a fire risk assessment of external areas, particularly balcony areas. During this assessment the following shall be taken into account:
 - Accessibility for fire fighting
 - Availability of fixed detection and fire fighting systems
 - Structural materials (particularly balcony partitions)
 - Chairs, tables and other furniture including any cushions or coverings
 - Paints
 - Deck or floor mats
 - Deck coverings
 - Handrails
 - Other combustible materials typically present, if any.
3. In accordance with the results of the fire risk assessment, and in consultation with regulatory authorities replace all inappropriate materials on balcony areas with materials that are determined to be acceptable. Replace all

combustible balcony dividers on a priority basis and as soon as possible with dividers that are of non-combustible material.

4. A plan to make any replacements of materials should be developed as a final step of the fire risk assessment, with the aim of completing this action within six months from the issue of this safety notice.

ICCL will follow-up with member lines regarding their progress.

ICCL and member lines will continue to work closely with the investigating authorities to review lessons learned from this incident and to take additional actions as appropriate.