

## LARGE PASSENGER SHIP SAFETY

### Directional Sound as an aid to passenger evacuation

#### Submitted by the United Kingdom

#### SUMMARY

**Executive Summary:** This paper introduces the concept and technology of directional, or broadband, sound as an aid to passenger evacuation. Results are presented of an analysis, carried out by the University of Strathclyde, of trials carried out onboard two ro-ro ferries. It concludes that directional sound can offer at least an equivalent level of safety to existing aids on escape routes, and can provide a solution to evacuation guidance in open public spaces where no acceptable solutions have yet been proposed.

**Action to be taken:** Paragraph 4

**Related documents:** MSC 74/WP.6 and FP 46/INF.9

#### Background

1 “Directional sound” has been successfully tested as an aid to evacuation guidance in buildings, where such systems have been installed, and by the aircraft industry. Following a demonstration given to the Sub-Committee at its forty-fifth session, the United Kingdom’s Maritime and Coastguard Agency agreed that shipboard trials should be carried out to assess the effectiveness of this new technology in the orderly and timely mustering of people on passenger ships.

2 Trials were conducted in June and October of 2001 onboard two ro-ro ferries to determine the effectiveness of directional sound beacons in accommodation areas, along corridors, on stairways and in open public spaces. Conditions during the trials were varied such that comparisons could be made with existing evacuation guidance systems required for escape routes, especially low-location lighting. Examination of these comparisons by an independent organisation (the University of Strathclyde) concluded that directional sound beacons offer at least an equivalent level of safety to that afforded by existing requirements. A summary of the results of these trials and the subsequent analysis are reported in FP 46/INF.9. Full details of the trials and the data analysis, including stills taken from thermal imaging video, are available on the internet at [www.directionalsoundevacuation.com](http://www.directionalsoundevacuation.com). Full copies of video material available on CD.

3 Open public spaces, which do not constitute routes of escape, are required to be fitted with emergency lighting only. In smoke filled conditions sufficient to obscure illuminated exit signs, there is no evacuation guidance afforded to passengers. Results of trials conducted in smoke filled open public spaces lead to the conclusion that the installation of directional sound beacons should be considered as mandatory in these spaces where no suitable alternative can be demonstrated.

## **Action requested of the Sub-Committee**

4 Noting that the United Kingdom intends to invite MSC 75 to consider how directional sound could be incorporated into the regulatory framework, the Sub-Committee is requested to instruct the Working Group on Evacuation Analysis, envisaged to be established at this session, to consider the technical aspects of:

- .1 the use of directional sound as an equivalent to the existing SOLAS requirements relating to means of escape; and
- .2 the mandatory fitting of directional sound beacons in open public spaces not considered to constitute an escape route.

The Sub-Committee is also invited to include in its report to MSC 75 the conclusions of plenary regarding paragraphs 4.1 and 4.2 above. This will provide the Committee with the advice of its expert Sub-Committee when considering under its agenda item “Large Passenger Ship Safety” any proposals to change the regulatory framework to allow the fitting of directional sound to aid passenger evacuation.

---