

## APPENDIX B

### HEELING TESTS FOR PASSENGER SHIPS OF CLASSES V, VI AND VI(A)

1. In accordance with paragraph 5.4.3 of these Instructions, the heeling test for non subdivided or partially decked ships of Classes V, VI and VI(A), for which accurate hydrostatic information is not available, shall be carried out in the following manner:

2. Before the vessel is tested in the fully loaded service condition specified in paragraph 3. The vessel is to be presented in a "lightweight" condition in order that the lightweight freeboards may be measured amidships, fore and aft. These freeboards are to be used as a reference for future lightweight checks which are required at five yearly intervals. (A copy of the lightweight condition is to be kept in the vessel's stability file.)

3. The ship shall be tested with weights to represent the maximum number of passengers (and cargo if carried) in the fully loaded service condition, the weights being disposed, as far as practicable, to represent the assumed distribution of passengers (and cargo, if carried). The fuel and fresh water tanks should be 95% full or, if not so filled, weights should be added equal to the weight of fuel and water necessary to bring the tanks to this level.

4. Each passenger shall be represented by a weight of 75kg. In decked or partially decked ships, the passengers shall be assumed to congregate at 0.30 m<sup>2</sup> per person on the highest deck or decks to which they have access, and the centre of gravity shall be assumed to be at 760mm above the deck. In open ships, or in the open portion of partially decked ships, the centre of gravity shall be assumed to be 300mm above the seating.

5. In this condition the freeboard of the ship, measured in accordance with paragraph 2 of Section 3 of Schedule 2 of Merchant Shipping Notice MSN 1699 (M), shall not be less than 380mm for ships of 6.0m in length or less and 760mm for ships of 18.3m in length or over. For lengths between 6.0m and 18.3m the freeboard shall be calculated by interpolation.

6. Battens shall be fitted close to the outboard sides of the ship, at amidships or at the portion of least freeboard where this is not at amidships for recording the freeboards. The distance between the battens shall be measured and recorded.

7. When the ship has been loaded with weights as described in paragraph 3., the freeboards (port and starboard) are to be recorded by marking the battens. Each batten shall also be marked with lines representing angles of heel of plus or minus 7°, which correspond to freeboards of:-

8. Calculate a heeling moment equal to  $1/12$  the weight of the passengers (W) multiplied by the extreme breadth (B) of the vessel  
=  $(WB/12)$ .
9. Transfer weights from one side of the vessel to the other side in 3 equal increments, such that the final heeling moment is equal to  $WB/12$ , the vertical centre of gravity of the whole being maintained. The weights, and the distance they are moved, together with the freeboards (P and S) shall be recorded for each of the three moves. (See however paragraph 13 (ii)).
10. Restore all the weights to their original positions, and record freeboards when they are restored.
11. Repeat 9 moving weights from opposite side.
12. Repeat 10.
13. (i) The total heeling moment of  $WB/12$  should be applied, provided an angle of heel of  $7^\circ$  is not exceeded. In cases where this angle would be exceeded by the application of  $WB/12$ , the owner might be given the opportunity of adding ballast sufficient to keep the angle within  $7^\circ$ , and the procedures at 9, 10, 11 and 12 carried out with the ballast fitted. The weight and position of such ballast shall be recorded.  
  
(ii) If, where  $WB/12$  would result in an angle exceeding  $7^\circ$ , the owner contends that  $WB/12$  could not arise in service and disputes the necessity of fitting ballast, special consideration may be given to such a case. In this event, the surveyor shall assess the heeling moment which is likely to arise due to the movement of passengers from one side to the other, especially on disembarkation. The boat should then be tested as at 9, 10, 11 and 12 using the heeling moment so derived instead of  $WB/12$ .
14. (i) If the angle of the heel does not exceed  $7^\circ$  when a heeling moment of  $WB/12$  is applied, the owner may be informed by the surveyor that the stability is satisfactory, and the details and results of the test attached to the ship's file for record.  
  
(ii) If, however, the angle of heel exceeds  $7^\circ$ , whether ballast is fitted or not, the owner should not be given to understand, at this stage, that the stability is satisfactory. The surveyor shall submit the details and results of the test on the ship's file to the Chief Surveyor, and should state in the report whether or not heeling moment equal to  $WB/12$  could be expected to arise in service. The acceptance of the ship, from stability considerations, will then be dealt with as follows:

(a) As a general rule, no vessel will be accepted when the angle of heel exceeds  $7^{\circ}$  as a result of a heeling moment of WB/12, or any greater heeling moment which could be expected to arise in service.

(b) Where an angle of heel exceeding  $7^{\circ}$  has arisen as a result of a heeling moment of WB/12, the seating and other arrangements of the vessel will be examined in conjunction with the surveyor's report. If it is found that a heeling moment less than WB/12 could be expected to arise in service, the information in the stability test report can then be used - by extrapolation - to see if an angle greater than  $7^{\circ}$  would arise as a result of this heeling moment.

15. In the case of existing Class V ships operating in Categories A and B waters alternative criteria may be accepted by the Regional Chief Surveyor in the form of a reduction in the allowable freeboard specified in Merchant Shipping Notice MSN 1699(M), Schedule 2, Section 3, paragraph 2 due to an angle of heel of less than  $7^{\circ}$  being attained from the heeling test which would result in an increase in the minimum residual freeboard.