

# APPENDIX D

## STABILITY INFORMATION BOOK

### 1. SUBDIVIDED (NON RO-RO) PASSENGER SHIPS CLASSES III TO VI(A)

#### 1.1 General

1.1.1 The information relating to the stability of the ship required by Regulation 31 and paragraph 5.3.1 of these Instructions is to include particulars appropriate to the ship of the matters specified below.

1.1.2 Such particulars are to be in the form of a Stability Information Book.

1.1.3 The book is to be divided into two parts namely Operational Information and Reference Information.

1.1.4 Metric units are to be used throughout.

#### 1.2 Operational Information

The information provided in this part of the book is for the use of the Master in order to ensure compliance with the stability criteria and safe operation of the ship and is as follows;

1.2.1 A "General Particulars" page including;

- (i) The ship's name, official number, port of registry, year of build and owners name and address,
- (ii) Principal dimensions, freeboard amidships, draught to the summer load line or subdivision load line as appropriate, full load displacement and allowable operational range of trim,
- (iii) Class of passenger certificate, number of passengers for which the ship is certified and the standard of survivability.
- (iv) Operational restrictions, eg area of operation, weather, loading of cargo etc.
- (v) Standard of survivability should include a statement of the damage stability criteria applicable to the ship and the extent of damage assumed (one or two compartment).

1.2.1.1 The area of operation and any operational restrictions are considered to be of prime importance when considering the possible relaxation of any aspect of the ship's survivability. As such a relaxation may only have been given in consideration of the area of operation, such cases require to be recorded as the ship may subsequently relocate to operate in a different area, where such a relaxation would not be permitted.

#### 1.2.2 A small scale "General Arrangement" plan

Showing with their names, all compartments, tanks, storerooms, crew and passenger accommodation spaces, the mid length position, fore and after perpendiculars and rake of keel (when appropriate) and the type and position of permanent ballast (when fitted). If the required permeability of any compartment has been achieved by the addition of buoyant material, the extent and type of material is to be shown on the general arrangement plan.

#### 1.2.3 "Notes on Intact Stability Criteria"

Derived from the appropriate parts of the Regulations and Merchant Shipping Notices. Where alternative intact stability criteria have been accepted in accordance with paragraph 5.2.1.3 of these Instructions, a statement to that effect is to be included.

#### 1.2.4 "Tank capacities and Notes on Free Surface Effects"

Including the volumes, specific gravity of the contents, centres of gravity and free surface moments. Notes on the use of free surface moments including a worked example showing how the vertical centre of gravity of the ship is affected by free surface of liquids on board.

#### 1.2.5 "Loading conditions"

Showing the ship in the departure and arrival conditions as appropriate, and a representative selection of loaded conditions (when necessary). A reference is to be made on each condition sheet that compares the actual KG with that from the maximum permissible KG for the required draught and trim to show that the condition meets the required stability criteria.

#### 1.2.6 "Details of the assigned subdivision load line"

Indicating the deck line, thickness of deck, keel line, thickness of keel and freeboard together with a statement of the maximum draught and displacement. In the case of ships carrying cargo a "deadweight scale" showing the displacement, tonnes per centimetre and deadweight covering the operational range of draughts for salt and fresh water operations is to be provided. Information relating to the position of draught marks is to be shown when necessary, on this arrangement, together with a sample calculation when the draught readings require correction

### 1.2.7 "Maximum Permissible KG Values"

This should be in the form of an envelope curve supplemented by notes on its use. It is preferable to give one envelope curve which covers all permutations of trim for both intact and damage stability considerations, unless this would lead to problems achieving the desired loading conditions.

### 1.2.8 "Notes for the Master Regarding Stability"

Explaining the use of the Limiting KG Curve provided for the ship and those included in Annex I of the Instructions to Surveyors.

## 1.3 Reference Information:-

The information provided in this part is for the use of the surveyor/consultant when assessing the stability and operational criteria provided in the Operational Information and is as follows;

### 1.3.1 "Hydrostatic Data"

Over the "operational" draughts of the vessel, stating whether they are for salt or fresh water. The page is to include the relationship between weight and volume.

### 1.3.2 "Notes on Damaged Stability Criteria"

Derived from the appropriate parts of the Regulations and Merchant Shipping Notices.

### 1.3.3 "The Damaged Condition" for the worst possible case

Showing compliance with the damage stability criteria and non-submergence of the margin line after damage.

### 1.3.4 "Maximum permissible KG Values"

Derived for both the intact and damaged stability criteria of the vessel.

### 1.3.5 The "Inclining Test Report and Lightship Calculation"

### 1.3.6 A "Lightweight History" page

This will be suitably endorsed by the attending surveyor, when the ship is checked at the required statutory periods.

1.3.7 Where it can be readily demonstrated that the margin of stability is so high that the ship cannot be overloaded in any practicable loading condition, the contents of the stability information may be reduced further. Under such circumstances, the booklet will not require items 1.2.4 and 1.2.5. Item 1.2.8

should include specific instructions for the Master to be satisfied and give assurance that the ship is safely loaded and that, as a minimum, that no more than the certificated number of passengers are being carried and that the subdivision mark is not submerged. Where small amounts of cargo may be carried, such instruction may specify a maximum weight and location with the vertical centre of gravity not exceeding a stated value.

## **2. SUBDIVIDED RO-RO PASSENGER SHIPS OF CLASSES III TO VIA**

### **2.1 General**

In addition to the general requirements listed in section I the following are required to be included for Ro-Ro Passenger Ships:-

2.1.1 Special notes regarding stability for Ro-Ro passenger ships (see Annex II).

2.1.2 A "Step by Step" guide for calculating actual loading conditions, including an example on its use. This should state the appropriate "option" from Merchant Shipping Notice No. M.1413 upon which the cargo KG's are based.

2.1.3 A worst "in port" condition drawing attention to the need to maintain adequate freeboard at openings during loading. This condition is to show positive stability when using KN curves derived to the deck below the opening concerned.

2.1.4 If any intact superstructures have been included as contributing to the derivation of the KN curves, the extent of the superstructures is to be marked on the general arrangement plan and a note is to be included in the instructions to the person in charge emphasising the need to close all access openings in the superstructures whilst the ship is under way.

## **3. SAMPLE LOADING CONDITIONS**

### **3.1 General**

Where sample loading conditions are submitted for approval for inclusion in the stability information booklet, in accordance with the Regulations, consideration should be given to the following points:-

3.1.1 All approved loading conditions should show a reasonable margin of stability over the limiting curve to account for minor variations in loading from the assumed values. In this respect the size of the margin which may be accepted should be considered in conjunction with the slope of the limiting curve, and the "option" from Merchant Shipping Notice No. M.1413 which has been chosen to determine the KG of the cargo.

3.1.2 Where the slope of the limiting curve is very steep, small variations in loading may give a large variation in the limiting KG.

3.1.3 The available options for the calculation range from:-

- (i) Option 1 - exact calculation with no margin, to
- (ii) Option 4 - pessimistic assumptions with high margin.

3.1.3 An extract from the appropriate option (from Merchant Shipping Notice No. M.1413) used in assessing the centre of gravity of the cargo is to be included in the stability information booklet.

3.1.4 Sample loading conditions should be produced for a range of draughts and trim which cover the operational envelope of the ship. Weights and longitudinal centres of gravity may be selected to cover this operating range.

3.1.5 When preparing approved loading conditions it is recommended that cargo, including passengers, is loaded "top down" eg Those items with the highest VCG should be assumed loaded first and, where a mix of vehicular cargo is possible, that with the highest VCG should be loaded in the first instance until the required deadweight is achieved. (This would normally be HGV's, with cars and lower saloon passengers being loaded thereafter).

3.1.6 Approved loading conditions should be made up in the above manner as the Regulations require the Master to ensure that for any given draught and trim, the ship is loaded closely with, but not inferior to, one of the approved loading conditions. To do this, the Master is only required to record the draught and trim, look up the approved loading condition which most closely reflects this position, and be satisfied that the actual cargo distribution is close to but not inferior to that shown in the condition.