

Ref. T3/2.01

## **GUIDELINES FOR THE PREPARATION OF THE CARGO SECURING MANUAL**

1 In accordance with regulations VI/5 and VII/6 of SOLAS 1974, as amended, cargo units and cargo transport units shall be loaded, stowed and secured throughout the voyage in accordance with the Cargo Securing Manual approved by the Administration, which shall be drawn up to a standard at least equivalent to the guidelines developed by the Organization.

2 The Maritime Safety Committee, at its sixty-sixth session (28 May to 6 June 1996), considered the draft Guidelines for the Preparation of the Cargo Securing Manual (DSC 1/27, annex 11 and DSC/Circ.1) prepared by the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC), at its first session (5 to 9 February 1996), and approved the Guidelines as amended and set out in the annex to this circular.

3 These Guidelines are based on the provisions contained in the annex to MSC/Circ.385 but have been expanded to include the applications explicit to ships which are equipped or adapted for the carriage of freight containers, taking into account the provisions of the Code of Safe Practice for Cargo Stowage and Securing (CSS Code), as amended. They are of a general nature and intended to provide guidance on the preparation of such Cargo Securing Manuals which are required on all types of ships engaged in the carriage of all cargoes other than solid and liquid bulk cargoes.

4 Member Governments are invited to bring these Guidelines to the attention of all parties concerned, with the aim of having Cargo Securing Manuals carried on board ships prepared appropriately and in a consistent manner, and to implement them as soon as possible and, in any case, not later than 31 December 1997.

5 This Circular replaces MSC/Circ.385 dated 8 January 1985.

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## ANNEX

### GUIDELINES FOR THE PREPARATION OF THE CARGO SECURING MANUAL

#### PREAMBLE

In accordance with the International Convention for the Safety of Life at Sea, 1974 (SOLAS) chapters VI, VII and the Code of Safe Practice for Cargo Stowage and Securing, cargo units, including containers shall be stowed and secured throughout the voyage in accordance with a Cargo Securing Manual, approved by the Administration.

The Cargo Securing Manual is required on all types of ships engaged in the carriage of all cargoes other than solid and liquid bulk cargoes.

The purpose of these guidelines is to ensure that Cargo Securing Manuals cover all relevant aspects of cargo stowage and securing and to provide a uniform approach to the preparation of Cargo Securing Manuals, their layout and content. Administrations may continue accepting Cargo Securing Manuals drafted in accordance with MSC/Circ.385 provided that they satisfy the requirements of these guidelines. If necessary, those manuals should be revised explicitly when the ship is intended to carry containers in a standardized system.

It is important that securing devices meet acceptable functional and strength criteria applicable to the ship and its cargo. It is also important that the officers on board are aware of the magnitude and direction of the forces involved and the correct application and limitations of the cargo securing devices. The crew and other persons employed for the securing of cargoes should be instructed in the correct application and use of the cargo securing devices on board the ship.

#### CHAPTER 1 - GENERAL

##### 1.1 Definitions

*Cargo Securing Devices* are all fixed and portable devices used to secure and support cargo units.

*Maximum Securing Load (MSL)* is a term used to define the allowable load capacity for a device used to secure cargo to a ship. *Safe Working Load (SWL)* may be substituted for MSL for securing purposes, provided this is equal to or exceeds the strength defined by MSL.

*Standardized Cargo* means cargo for which the ship is provided with an approved securing system based upon cargo units of specific types.

*Semi-standardized Cargo* means cargo for which the ship is provided with a securing system capable of accommodating a limited variety of cargo units, such as vehicles, trailers, etc.

*Non-standardized Cargo* means cargo which requires individual stowage and securing arrangements.

##### 1.2 General information

This chapter should contain the following general statements:

- .1 "The guidance given herein should by no means rule out the principles of good seamanship, neither can it replace experience in stowage and securing practice".
- .2 "The information and requirements set forth in this Manual are consistent with the

requirements of the vessel's trim and stability booklet, International Load Line Certificate (1966), the hull strength loading manual (if provided) and with the requirements of the International Maritime Dangerous Goods (IMDG) Code (if applicable)".

- .3 "This Cargo Securing Manual specifies arrangements and cargo securing devices provided on board the ship for the correct application to and the securing of cargo units, containers, vehicles and other entities, based on transverse, longitudinal and vertical forces which may arise during adverse weather and sea conditions."
- .4 "It is imperative to the safety of the ship and the protection of the cargo and personnel that the securing of the cargo is carried out properly and that only appropriate securing points or fittings should be used for cargo securing."
- .5 "The cargo securing devices mentioned in this manual should be applied so as to be suitable and adapted to the quantity, type of packaging, and physical properties of the cargo to be carried. When new or alternative types of cargo securing devices are introduced, the Cargo Securing Manual should be revised accordingly. Alternative cargo securing devices introduced should not have less strength than the devices being replaced."
- .6 "There should be a sufficient quantity of reserve cargo securing devices on board the ship."
- .7 "Information on the strength and instructions for the use and maintenance of each specific type of cargo securing device, where applicable, is provided in this manual. The cargo securing devices should be maintained in a satisfactory condition. Items worn or damaged to such an extent that their quality is impaired should be replaced."

## **CHAPTER 2 - SECURING DEVICES AND ARRANGEMENTS**

### **2.1 Specification for fixed cargo securing devices**

This sub-chapter should indicate and where necessary illustrate the number, locations, type and MSL of the fixed devices used to secure cargo and should as a minimum contain the following information:

- .1 a list and/or plan of the fixed cargo securing devices, which should be supplemented with appropriate documentation for each type of device as far as practicable. The appropriate documentation should include information as applicable regarding:
  - \* Name of manufacturer
  - \* Type designation of item with simple sketch for ease of identification
  - \* Material(s)
  - \* Identification marking
  - \* Strength test result or ultimate tensile strength test result
  - \* Result of non destructive testing
  - \* Maximum Securing Load (MSL);
- .2 fixed securing devices on bulkheads, web frames, stanchions, etc. and their types (e.g. pad eyes, eyebolts, etc.), where provided, including their MSL;
- .3 fixed securing devices on decks and their types (e.g. elephant feet fittings, container fittings apertures, etc.) where provided, including their MSL;
- .4 fixed securing devices on deckheads, where provided, listing their types and MSL; and
- .5 for existing ships with non-standardized fixed securing devices, the information on MSL and location of securing points is deemed sufficient.

## 2.2 Specification for portable cargo securing devices

This sub-chapter should describe the number of and the functional and design characteristics of the portable cargo securing devices carried on board the ship, and should be supplemented by suitable drawings or sketches if deemed necessary. It should contain the following information as applicable:

- .1 a list for the portable securing devices, which should be supplemented with appropriate documentation for each type of devices as far as practicable. The appropriate documentation should include information as applicable regarding:
  - \* Name of manufacturer
  - \* Type designation of item with simple sketch for ease of identification
  - \* Material(s), including minimum safe operational temperature
  - \* Identification marking
  - \* Strength test result or ultimate tensile strength test result.
  - \* Result of non destructive testing
  - \* Maximum Securing Load (MSL);
- .2 container stacking fittings, container deck securing fittings, fittings for interlocking of containers, bridge-fittings, etc., their MSL and use;
- .3 chains, wire lashings, rods, etc., their MSL and use ;
- .4 tensioners (e.g. turnbuckles, chain tensioners, etc.), their MSL and use;
- .5 securing gear for cars, if appropriate, and other vehicles, their MSL and use;
- .6 trestles and jacks, etc., for vehicles (trailers) where provided, including their MSL and use; and
- .7 anti-skid material (e.g. soft boards) for use with cargo units having low frictional characteristics.

## 2.3 Inspection and maintenance schemes

This sub-chapter should describe inspection and maintenance schemes of the cargo securing devices on board the ship.

2.3.1 Regular inspections and maintenance should be carried out under the responsibility of the master. Cargo securing devices inspections as a minimum should include:

- .1 routine visual examinations of components being utilized; and
- .2 periodic examinations/re-testing as required by the Administration. When required, the cargo securing devices concerned should be subjected to inspections by the Administration.

2.3.2 This sub-chapter should document actions to inspect and maintain the ship's cargo securing devices. Entries should be made in a recordbook, which should be kept with the Cargo Securing Manual. This recordbook should contain the following information:

- .1 procedures for accepting, maintaining and repairing or rejecting cargo securing devices; and
- .2 record of inspections.

2.3.3 This sub-chapter should contain information for the master regarding inspections and adjustment of securing arrangements during the voyage.

2.3.4 Computerized maintenance procedures may be referred to in this sub-chapter.

## **CHAPTER 3 - STOWAGE AND SECURING OF NON-STANDARDIZED AND SEMI-STANDARDIZED CARGO**

### **3.1 Handling and safety instructions**

This sub-chapter should contain:

- .1 instructions on the proper handling of the securing devices; and
- .2 safety instructions related to handling of securing devices and to securing and unsecuring of units by ship or shore personnel.

### **3.2 Evaluation of forces acting on cargo units**

This sub-chapter should contain the following information:

- .1 tables or diagrams giving a broad outline of the accelerations which can be expected in various positions on board the ship in adverse sea conditions and with a range of applicable metacentric height (GM) values;
- .2 examples of the forces acting on typical cargo units when subjected to the accelerations referred to in paragraph 3.2.1 and angles of roll and metacentric height (GM) values above which the forces acting on the cargo units exceed the permissible limit for the specified securing arrangements as far as practicable;
- .3 examples of how to calculate number and strength of portable securing devices required to counteract the forces referred to in 3.2.2 as well as safety factors to be used for different types of portable cargo securing devices. Calculations may be carried out according to Annex 13 to the CSS Code or methods accepted by the Administration;
- .4 it is recommended that the designer of a Cargo Securing Manual converts the calculation method used into a form suiting the particular ship, its securing devices and the cargo carried. This form may consist of applicable diagrams, tables or calculated examples; and
- .5 other operational arrangements such as electronic data processing (EDP) or use of a loading computer may be accepted as alternatives to the requirements of the above paragraphs 3.2.1 to 3.2.4, providing that this system contains the same information.

### **3.3 Application of portable securing devices on various cargo units, vehicles and stowage blocks**

3.3.1 This sub-chapter should draw the master's attention to the correct application of portable securing devices, taking into account the following factors:

- .1 duration of the voyage;
- .2 geographical area of the voyage with particular regard to the minimum safe operational temperature of the portable securing devices;
- .3 sea conditions which may be expected;
- .4 dimensions, design and characteristics of the ship;
- .5 expected static and dynamic forces during the voyage;

- .6 type and packaging of cargo units including vehicles;
- .7 intended stowage pattern of the cargo units including vehicles; and
- .8 mass and dimensions of the cargo units and vehicles.

3.3.2 This sub-chapter should describe the application of portable cargo securing devices as to number of lashings and allowable lashing angles. Where necessary, the text should be supplemented by suitable drawings or sketches to facilitate the correct understanding and proper application of the securing devices to various types of cargo and cargo units. It should be pointed out that for certain cargo units and other entities with low friction resistance, it is advisable to place soft boards or other anti-skid material under the cargo to increase friction between the deck and the cargo.

3.3.3 This sub-chapter should contain guidance as to the recommended location and method of stowing and securing of containers, trailers and other cargo carrying vehicles, palletized cargoes, unit loads and single cargo items (e.g. woodpulp, paper rolls, etc.), heavy weight cargoes, cars and other vehicles.

### **3.4 Supplementary requirements for ro-ro ships**

3.4.1 The manual should contain sketches showing the layout of the fixed securing devices with identification of strength (MSL) as well as longitudinal and transverse distances between securing points. In preparing this sub-chapter further guidance should be utilized from IMO Assembly resolutions A.533(13) and A.581(14) as appropriate.

3.4.2 In designing securing arrangements for cargo units, including vehicles and containers, on ro-ro passenger ships and specifying minimum strength requirements for securing devices used, forces due to the motion of the ship, angle of heel after damage or flooding and other considerations relevant to the effectiveness of the cargo securing arrangement should be taken into account.

### **3.5 Bulk carriers**

If bulk carriers carry cargo units falling within the scope of chapter VI/5 or chapter VII/5 of SOLAS Convention, this cargo shall be stowed and secured in accordance with a Cargo Securing Manual, approved by the Administration.

## **CHAPTER 4 - STOWAGE AND SECURING OF CONTAINERS AND OTHER STANDARDIZED CARGO**

### **4.1 Handling and safety instructions**

This sub-chapter should contain:

- .1 instructions on the proper handling of the securing devices; and
- .2 safety instructions related to handling of securing devices and to securing and unsecuring of containers or other standardized cargo by ship or shore personnel.

### **4.2 Stowage and securing instructions**

This sub-chapter is applicable to any stowage and securing system (i. g. stowage within or without cellguides) for containers and other standardized cargo. On existing ships the relevant documents regarding safe stowage and securing may be integrated into the material used for the preparation of this chapter.

#### **4.2.1 Stowage and securing plan**

This sub-chapter should consist of a comprehensive and understandable plan or set of plans providing the necessary overview on:

- .1 longitudinal and athwartship views of under deck and on deck stowage locations of containers as appropriate;
- .2 alternative stowage patterns for containers of different dimensions;
- .3 maximum stack masses;
- .4 permissible vertical sequences of masses in stacks;
- .5 maximum stack heights with respect to approved sight lines; and
- .6 application of securing devices using suitable symbols with due regard to stowage position, stack mass, sequence of masses in stack and stack height. The symbols used should be consistent throughout the Cargo Securing Manual .

#### 4.2.2 Stowage and securing principle on deck and under deck

This sub-chapter should support the interpretation of the stowage and securing plan with regard to container stowage, highlighting:

- .1 the use of the specified devices; and
- .2 any guiding or limiting parameters as dimension of containers, maximum stack masses, sequence of masses in stacks, stacks affected by wind load, height of stacks.

It should contain specific warnings of possible consequences from misuse of securing devices or misinterpretation of instructions given.

### 4.3 Other allowable stowage patterns

This sub-chapter should provide the necessary information for the master to deal with cargo stowage situations deviating from the general instructions addressed to under sub-chapter 4.2, including appropriate warnings of possible consequences from misuse of securing devices or misinterpretation of instructions given.

Information should be provided with regard to, *inter alia*:

- .1 alternative vertical sequences of masses in stacks;
- .2 stacks affected by wind load in the absence of outer stacks;
- .3 alternative stowage of containers with various dimensions; and
- .4 permissible reduction of securing effort with regard to lower stacks masses, lesser stack heights or other reasons.

### 4.4 Forces acting on cargo units

This sub-chapter should present the distribution of accelerations on which the stowage and securing system is based, and specify the underlying condition of stability. Information on forces induced by wind and sea on deck cargo should be provided.

It should further contain information on the nominal increase of forces or accelerations with an increase of initial stability. Recommendations should be given for reducing the risk of cargo losses from deck stowage by restrictions to stack masses or stack heights, where high initial stability cannot be avoided.

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