

標 題：

貨物固縛マニュアルについて

NKテクニカル インフォメーション

No.: 178

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関係船主、造船所 各位

拝啓、貴社ますますご清栄のこととお喜び申し上げます。

さて、1994 年 12 月に開催された第 64 回MSCにおいてSOLAS VI章及びVII章の一部改正が採択され、貨物ユニット^{*1}を運送する船舶では、本年 7 月 1 日から、主管庁により承認された貨物固縛マニュアルに従って、貨物ユニットを適切に積み付け、固縛することが義務付けられることになりました。このSOLAS改正により、現存船を含むすべての貨物ユニットを運送する船舶には、改正規則の発効日^{*2}までに貨物固縛マニュアルを供与しておくことが必要となりました。

本会はこのSOLAS改正に対応するため、船籍国政府に代って貨物固縛マニュアルを承認すべく、代行権限の取得等承認体制を整えているところです。また一方で、皆様がこの貨物固縛マニュアルを容易に又円滑に作成することができるよう、貨物固縛マニュアルの作成要領の準備も進めております。さらに、関連業界と協議の上同マニュアルのサンプルも作成中であります。これらは近々完成する^{*3}予定ですので、3 月中にはより詳細な情報を添えて皆様にお知らせするよう考えております。以上、取りあえず現状をお知らせ致しますが、3 月末の完成まで今しばらくお待ち戴きたくお願い申し上げます。

なお、ご不明の点がございましたら、本会開発部までお問い合わせ願います。

*1：貨物ユニットとは、車両（道路車両、ロールトレイラー等）、鉄道車両、コンテナ、フラット、パレット、ポータブルタンク、中型容器（IBC）、包装ユニット、ユニット貨物、包装貨物のようなユニットを運ぶ他の貨物、スチールコイルのような貨物並びに機関車及び変圧器のような重量物をいいます。また、本船で運送するもので、船体に恒久的に固定されない載貨装置又はその一部も貨物ユニットとみなされます。（IMOの定めた「貨物固縛マニュアルの準備のためのガイドライン」中の定義による。）

*2：改正規則発効日については、IMOにおいて次のような議論がなされています。関連SOLAS改正案は本年 7 月 1 日に発効する予定となっておりますが、貨物固縛マニュアルの準備のためのガイドラインの採択予定日と規則発効日の間に時間的な余裕がないため、同マニュアルの所持に関する猶予期間を設けるべきとの議論がIMOにおいてなされております。この件については、本年 6 月の第 66 回海上安全委員会にて結論が出される予定となっておりますが、現状

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では、早めに同マニュアルを準備することが無難であると考えます。

- * 3 : この貨物固縛マニュアルは、IMOの定めた「貨物固縛マニュアルの準備のためのガイドライン」に従って作成されたものでなければなりません。しかしながら当該ガイドラインは、本年の2月5日から9日の期間中IMO本部で開催されましたDSC小委員会（SUB-COMMITTEE ON THE CARRIAGE OF DANGEROUS GOODS, SOLID CARGOES AND CONTAINER）においてようやくその最終案が承認されたものであります。さらに最終的には、本年6月に開催されるIMOの第66回海上安全委員会にて承認される予定ではありますが、最終案からの変更はないものと考えて、現在ようやく完成の目処が立ったところであります。参考までに、当該ガイドラインの最終案を添付致します。

敬具

添付参考資料：貨物固縛マニュアル作成のためのガイドライン（案）

VOID

ANNEX

DRAFT MSC CIRCULAR

GUIDELINES FOR THE PREPARATION OF THE CARGO SECURING MANUAL

1 In accordance with regulations VI/5 and VII/5 of SOLAS 1974, as amended, cargo units, including containers 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 ~~provisions~~ guidelines set out in the annex to this Circular, are based on those 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 containers and have taken into account the provisions of the CSS Code as amended. They are of a general nature and intended to provide guidance on the preparation of such a Cargo Securing Manual [which is required on all types of ships engaged in the carriage of cargo units as defined in these guidelines].

3 Member Governments are invited to bring this Circular to the attention of all concerned, with the aim of having cargo securing manuals carried on board ships prepared appropriately and in a consistent manner.

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

ANNEX

PROVISIONS TO BE INCLUDED IN THE CARGO SECURING MANUAL TO BE CARRIED ON BOARD SHIPS 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.

[This cargo Securing Manual is required on all types of ships engaged in the carriage of cargo units as defined in these guidelines.]

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, these manuals should be revised explicitly when the ship is intended to carry containers in a standardized system.

It is important that securing gear 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 gear. The crew and other persons employed for the securing of cargoes should be instructed in the correct application and use of the cargo securing gear on board the ship.

The following statements shall be included in the Cargo Securing Manual:

CHAPTER 1 - GENERAL

1.1 Definitions

Cargo Units means vehicles (road vehicles, roll trailers, etc.), railway wagons, containers, flats, pallets, portable tanks, intermediate bulk containers (IBC), packaged units, unit loads, other cargo carrying units such as shipping cassettes, cargo entities such as steel coils and heavy cargo items such as locomotives and transformers. Loading equipment, or any part thereof, transported on the ship, but which is not permanently fixed to the ship, is also considered as cargo units.

Cargo Securing Devices is 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.] ~~[Provided it serves to the same effect.]~~

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 ~~provisions information~~ statements:

- 1 "The guidance given herein should by no means rule out the principles of good seamanship, neither can they replace experience in stowage and securing practice"; and
- 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 ~~securing gear~~ 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."
- 2.4 "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."
- 3.5 "The cargo securing gear 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 gear devices are introduced, the Cargo Securing Manual should be revised accordingly. Alternative cargo securing gear devices introduced should not have a specified lower maximum securing load (MSL)⁺ less strength than the equipment which it replaces."
- 4.6 "There should be a sufficient quantity of reserve cargo securing gear devices on board the ship."
- 5.7 "Information on the MSL strength and instructions for the use and maintenance of each specific type of cargo securing gear, where applicable, ~~should be provided~~ is provided in this manual. The cargo securing gear devices should be maintained in a satisfactory condition. Items worn or damaged to such an extent that their quality is impaired should be replaced ~~by equivalent equipment~~."

⁺ ——— Refer to the Annex 13 to the Code of Safe Practice for Cargo Stowage and Securing (CSS Code)

~~It is recommended that an abridged working version of the Cargo Securing Manual be prepared for the every day use of crew members and shore workers employed in securing cargoes. Care must be taken to ensure that this abridged working version is kept current with the fully approved version. Illustrations, schematic diagrams or photographs with appropriate brief instructions/notes should be used wherever possible.~~

CHAPTER 2 - SECURING DEVICES AND ARRANGEMENTS FOR ALL SHIPS

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 fittings used to secure cargo ~~units and vehicles~~. ~~The Cargo Securing Manual and~~ should as a minimum contain the following information:

- ~~4.1~~ ~~an inventory~~ a list and/or plan for of the fixed securing equipment cargo securing devices, which should be supplemented with appropriate documentation for each type of equipment 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)
 - * Identification marking
 - * Strength test result or ultimate tensile strength test result
 - * Result of non destructive testing
 - * Maximum Securing Load (MSL)
- ~~4.2~~ fixed securing facilities on bulkheads, web frames, stanchions, etc. and their types (e.g. pad eyes, eyebolts, etc.), where provided, including their MSL;
- ~~4.3~~ fixed securing facilities on decks and their types (e.g. elephant feet fittings, container fittings apertures, etc.) where provided, including their MSL;
- ~~4.4~~ fixed securing facilities 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 gear devices carried on board the ship, and should be supplemented by suitable drawings or sketches if deemed necessary. It should, ~~as a minimum~~, contain the following information as applicable:

- ~~7.1~~ ~~an inventory~~ a list for the portable securing equipment devices, which should be supplemented with appropriate documentation for each type of equipment 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 ~~range of~~ temperatures
- * Identification marking
- * Strength test result or ultimate tensile strength test result.
- * Result of non destructive testing
- * Maximum Securing Load (MSL);

-2.2 container stacking fittings, container deck securing fittings, fittings for interlocking of containers, bridge-fittings, etc., their MSL and use;

-2.3 chains, wire lashings, rods, etc., their MSL and use ;

-3.4 tensioners (e.g. turnbuckles, chain tensioners, etc.), their MSL and use;

-4.5 securing gear for cars, if appropriate, and other vehicles, their MSL and use;

-5.6 trestles and jacks, etc., for vehicles (trailers) where provided, including their MSL and use; and

-6.7 anti-skid material (e.g. soft boards) for use with cargo units having low frictional characteristics; and

2.3 Inspection and maintenance schemes

This sub-chapter should describe inspection and maintenance schemes of the securing equipment 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 gear devices inspections as a minimum should include:

- 1 routine visual examinations of all 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 gear 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 gear 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.

~~2.4 — 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 GM values;~~
- ~~2 — examples of the forces acting on typical cargo units when subjected to the accelerations referred to in paragraph 2.4.1 and angles of roll and 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 2.4.2, as well as safety factors to be used for different types of portable cargo securing equipment. Calculations may be carried out according to annex 13 to the CSS Code;~~
- ~~4 — for standardized cargo the same information is necessary, but based on rules of a classification society or other authorized body;~~
- ~~5 — on multi-purpose ships, both methods (as indicated in 2.4.3 and 2.4.4) should be presented with a clear, short instruction on their interpretation;~~
- ~~6 — recommendations should be given for action to be taken by the master when sea conditions are such that in the master's opinion the ship motion will generate forces likely to exceed the design parameters of securing arrangements (see 2.4.2); and~~
- ~~7 — other operational arrangements such as electronic data processing (EDP) or electronic data interchange (EDI) or use of a loading computer may be accepted as alternatives to the requirements of the above paragraphs 2.4.1 to 2.4.5, provided that this system contains the same information.~~

CHAPTER 3 - ADDITIONAL INFORMATION FOR SHIPS CARRYING 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 equipment devices; and
- 2 safety instructions related to handling of securing equipment 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 heights (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 equipment. 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 Cargo Securing Manual converts this presentation into a form suiting the particular ship, its securing equipment 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.

3.23 Application of portable securing gear devices on various cargo units, vehicles and stowage blocks

3.2-33.1 This sub-chapter should draw the master's attention to applying the correct application of portable securing gear 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 range of temperatures of the portable securing gear 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.

3.2-43.2 This sub-chapter should describe the application of portable cargo securing gear 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 gear 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.

3.2-23.3 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.

3.34 Supplementary requirements for ro-ro ships

1 ~~For ro-ro ships~~ The manual should contain sketches showing the layout of the fixed securing equipment 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.

2 In designing securing arrangements for cargo units, including vehicles and containers, on ro-ro passenger ships and specifying minimum strength requirements for equipment used, ~~the forces should be taken into account by~~ taking into account 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.

3.5 Bulk carriers

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

CHAPTER 4 - ~~ADDITIONAL INFORMATION FOR SHIPS EQUIPPED OR ADAPTED FOR STANDARDIZED CARRIAGE OF CARGOES, IN PARTICULAR, CONTAINERS STOWAGE AND SECURING OF CONTAINERS AND OTHER STANDARDIZED CARGO~~

~~Cargoes other than containers to be carried in a standardized manner should be treated in accordance with this chapter as appropriate.~~

4.1 Handling and safety instructions

This sub-chapter should contain:

- 1 instructions on the proper handling of the securing ~~equipment devices~~; and
- 2 safety instructions related to handling of securing ~~equipment 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 ~~approved~~ stowage and securing ~~concept~~ system (i.e. g. stowage within or without cellguides) ~~of~~ 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 equipment devices using suitable symbols with due regard to stowage position, stack mass, sequence of masses in stack and stack height. The symbols used should permit a clear reference to chapter 2 of the manual 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 equipment 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 or misuse of instructions given.

4.4.3 Deviating 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 negligence 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.

4.34 Influence of ship's stability Forces acting on cargo units

~~This sub-chapter should specify the condition of stability on which the layout of the whole securing arrangement is based with due reference to the distribution of forces or accelerations shown in chapter 2.4.~~

~~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.

4.4 Deviating 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 negligence or misinterpretation.~~

~~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.~~