REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF TRANSPORT
DEPARTMENT OF MARINE ADMINISTRATION

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Date : 7th October 2014

Directive (11/2014)

Safe Practice for Cargo Stowage and Securing

Applicable to : All Ship - owners, Ship Operators, Flag State Surveyors, Recognized Organizations, Masters and Officers of Myanmar Flagged Ships.

Reference :

(a) **SOLAS 74, as amended Reg:VI/2.1**
(b) **IMO Res.A.714(17)**
(c) **IMO Res.A.489(XII)**
(d) **IMO MSC/Circ. 745**
(e) **IMO Res.A.533(13)**
(f) **IMO Res.A.581(14)**
(g) **IMO/ILO/UNECE Guidelines for packing of cargo transport units**
(h) **IMO Res.A.864(20)**
(i) **IMO MSC 1/Circ.1353/Rev. L**

1. The Department of Marine Administration circulates this directive in the exercise of the power of Section 294 (B), paragraph (b) of Myanmar Merchant Shipping Act 1923, as amended.

2. This Directive applies to cargoes carried on board the Myanmar flagged ships engaged on international voyages (other than solid and liquid cargoes and timber stowed on deck) and, in particular, to those cargoes whose stowage and securing have proved in practice to create difficulties.

3. The parties concerned shall comply with the requirements of Code of Safe Practice for Cargo Stowage and Securing, especially the sub-chapter 1.9 Cargo Information.

4. The Guidance for the Safe Practice for Cargo Stowage and Securingis set out by Department of Marine Administration to fulfill the relevant requirements of the above-mentioned references.

Maung Maung Oo
Director General
Department of Marine Administration

1. CARGO STOWAGE AND SECURING

1.1 Policy

To implement cargo stowage and securing for safe carriage in an efficient and effective manner in accordance with Chapter VI and VII of the International Convention for the Safety of Life at Sea (SOLAS), 1974 as amended.

1.2. Purpose

To ensure that all cargo units, including containers, are loaded, stowed and secured throughout the voyage in accordance with the ship's approved cargo securing manual.

1.3. Application

1.3.1 This procedure applies to;

(a) the stowing and securing of cargoes in a ship registered in Myanmar

(b) a cargo unit or cargo transport unit packed or being packed for transport on a ship referred to in (a).

1.3.2 This procedure does not apply to bulk cargoes of solid, liquid or gaseous nature.

1.4. Responsibilities

1.4.1. The **Director General** is responsible for the overall in – charge of the implementation of this procedure. The Deputy Director General (Tech) is responsible for the absence of Director General or when delegated by Director General.

1.4.2. The **Director (Nautical Division)** is responsible for

.1 decision on policy matters, the close monitoring and the improvement of the process,

.2 the assignment of any available surveyor when received the survey requested,

.3 the advice as requested by the surveyor or the guidance which is required to provide the surveyor as he deems whenever necessary,

.4 reporting of the survey outcome to Director General as necessary,

.5 the safe keeping of the survey records, and

.6 the proposal for the amendment of this procedure as and when required, and

.7 delegation to the Deputy Director (Nautical Division)at his absence.

1.4.3. The **Surveyor** is responsible for

.1 performing the survey and issue Cargo securing Manual, and

.2 reporting of the survey outcome to the Director.

1.4.4. The **Ship's Master** is responsible for

.1 receiving cargo information from the Shipper, appropriate information on the cargo sufficiently in advance of loading to enable the precautions which may be necessary for proper stowage and safe carriage of the cargo to be put into effect before commencement of loading of cargo at a port.

The cargo information is to include;

(a) a general description of the cargo;

(b) the gross mass of the cargo or of the cargo units;

(c) any relevant special properties of the cargo; and

(d) the information specified in paragraph 1.9 of this procedure.

.2 performing cargo, cargo units and cargo transport units carried on or

under deck must be so loaded, stowed and secured as to prevent as far as is practicable, thorough out the voyage, damage or hazard to the ship and the persons on board, and loss of cargo overboard.

1.5. The Survey and certification process

.1 The ship owner or ship agent request for Approval of a Cargo Securing Manual to Director (Nautical Division).

.2 Director (Nautical Division) assigns the Surveyor and date of survey and sent it to survey section for billing and keeping the records after application is received and registered.

.3 The surveyor arrange to conduct survey with the applicants.

.4 The Surveyor conducts the survey and it shall be as evidence that the ship is capable of complying with specific requirements of Code of Safe Practice for Cargo Stowage and Securing.

.5 Upon satisfactory completion of the survey, the surveyor prepares the necessary survey reports. The survey section and surveyor prepares the relevant Cargo Securing Manual to verify before sending it to Director (Nautical Division).

.6 Director(Nautical Division) checks the Cargo Securing Manual before sending it to Director General. The Cargo Securing Manual is signed by Director General or the Director in the absence of Director General.

.7 The survey section files the office copy of the Cargo Securing Manual, survey records and billing documents.

1.6 Definitions

1.6.1 Administration means Department of Marine Administration for performance of executive duties.

1.6.2 Survey: A general view, examination, or description of someone or something.

1.6.3 CSS Code means the Code of Safe Practice for Cargo Stowage and Securing (including the Annexes and Appendixes thereto), published by the IMO.

1.7 Equivalents and exemptions

1.7.1 Equivalents

If a provision of the CSS Code or this Procedure requires a particular fitting, material, appliance or apparatus or type there of to be fitted or carried in a ship, or particular provision to be made in relation to a ship or its equipment or in relation to a cargo, the Surveyor may, upon written request, allow a modification or variation of that requirement if satisfied that the fitting, material, appliance or apparatus or type thereof or other provision so allowed is at least as effective as that required by the CSS Code or this Part.

1.7.2 Exemptions

The Surveyor will, upon written request, if satisfied that compliance with a requirement of the CSS Code or this Procedure would in a particular case be unreasonable or impracticable, allow exemption in relation to a ship or a cargo from compliance with such requirement or provision to such extent and subject to such conditions as that officer determines.

1.7.3 Exemptions and Equivalents not to contravene SOLAS

The Survey must not allow an equivalent under 1.7.1 or give an exemption under 1.7.2 if it would contravene SOLAS.

1.8. Preparation of the manual

The Cargo Securing Manual shall be written in English language and developed, taking into account the recommendations given as follows,

1 GNEREAL

1.1 Definitions

1.1.1 Cargo securing devices are all fixed and portable devices used to secure and support cargo units.

1.1.2 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.

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

1.1.4 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.

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

1.2 General information

1.2.1 This chapter shall 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."

.8 The Cargo Safe Access Plan (CSAP) is intended to provide detailed information for persons engaged in work connected with cargo stowage

and securing. Safe access should be provided and maintained in accordance with this plan.

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:

.1 name of manufacturer;

.2 type designation of item with simple sketch for ease of identification;

.3 material(s);

.4 identification marking;

.5 strength test result or ultimate tensile strength test result;

.6 result of non destructive testing; and

.7 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 device, as far as practicable. The appropriate documentation should include information as applicable regarding:

.1 name of manufacturer;

.2 type designation of item with simple sketch for ease of identification;

.3 material(s), including minimum safe operational temperature;

.4 identification marking;

.5 strength test result or ultimate tensile strength test result;

.6 result of non destructive testing; and

.7 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.

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

.1 procedures for accepting, maintaining and repairing or rejecting cargo securing devices; and

.2 record of inspections.

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

.4 Computerized maintenance procedures may be referred to in this sub-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-charter 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

.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.

.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 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

.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.

.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 the SOLAS Convention, this cargo shall be stowed and secured in accordance with a Cargo Securing Manual, approved by the Administration.

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.e. 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.

.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.

.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.

.3 Other allowable stowage patterns

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

.2 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.

4.3 Forces acting on cargo units

.1 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.

.2 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.

5 CARGO SAFE ACCESS PLAN (CSAP)

.1 Ships which are specifically designed and fitted for the purpose of carrying containers should be provided with a Cargo Safe Access Plan (CSAP) in order to demonstrate that personnel will have safe access for container securing operations. This plan should detail arrangements necessary for the conducting of cargo stowage and securing in a safe manner. It should include the following for all areas to be worked by personnel:

.1 hand rails;

.2 platforms;

.3 walkways;

.4 ladders;

.5 access covers;

.6 location of equipment storage facilities;

.7 lighting fixtures;

.8 container alignment on hatch covers/pedestals;

.9 fittings for specialized containers, such as reefer plugs/ receptacles;

.10 first aid stations and emergency access/egress;

.11 gangways; and

.12 any other arrangements necessary for the provision of safe access.

.2 Guidelines for specific requirements are contained in annex 14 to the CSS Code.

1.9. Cargo Information

1.9.1 Prior to shipment the shipper shall provide all necessary information about the

cargo to enable the shipowner or ship operator to ensure that:

1. the different commodities to be carried are compatible with each other or
   suitable separated;
2. the cargo is suitable for the ship;
3. the ship is suitable for the cargo; and
4. the cargo can be safely stowed and secured on board the ship and transported under all expected conditions during the intended voyage.

1.9.2 The master should be provided with adequate information regarding the cargo to be carried so that its stowage may be properly planned for handling and transport.

1.10 Type approval for Cargo Securing Device

1.10.1 Administration may accept Type approval which is based on plan approval and prototype testing, issued by Recognized Organization or Class Society. Type approval scheme consists of two alternatives, with two different certificate:

(1) Type approval certificates are based on a review of the design, i.e. plan approval, and are issued for products that have been manufactured and prototype tested, and is only valid for the one manufacturing plant. Certificates are valid for 2 or 4 years and will be entered in the Recognized Organization or Class Society's register of Approved Products and Manufacturers.

(2) Design assessment for type approval certificates are based only upon a review of the design of a component. However, before any product certificates for securing devices can be issued based on this scheme, prototype tests have to be carried out. Normally, prototype tests have to be done by each manufacturer of a product, but after special consideration the Recognized Organization or Class Society may accept that prototype testing not be repeated when production is started by a

new manufacturer. Design assessment for type approval certificates are valid for 4 years.

Manufacturers that produce components covered by a design assessment for type approval certificate can, upon request, be given a type approval certificate. This certificate will always refer to the holder of the design assessment for type approval certificate, and does not give the manufacturer any right to manufacture the product without the consent of the designer. Such type approval is recommended for products that are produced in series or where the designer and manufacturer expect repeat orders.

One type approval or design assessment for type approval certificate may cover different variations of the same basic type of device. Variations may include e.g. different materials, lengths or breaking loads. Each variation may have to be prototype tested.

1.10.2 Plan Approval

Approval will be based on an evaluation of the strength of each securing device, as described in the following subsections. However, factors related to safe use will also be considered:

1. Securing devices that function as mechanisms must have safe and reliable operation throughout their operational lifespan.
2. The risk of incorrect application of securing devices should be minimised through design, marking or labelling and user instructions.
3. For devices that may have small margins against malfunction or failure, a more detailed analysis of safety will be considered; such smaller margins may for instance be related to:
   - wear or corrosion
   - small contact areas for load transfer

- difficult or impossible verification that the device is properly attached and locked after application
- enhanced need for maintenance.

Cargo securing devices may be subject to tension, compression or shearforces, or combinations thereof. The forces may be static or dynamic. However, during prototype testing the test specimens will normally be subject to one type of static force at a time.

During operation, securing devices are normally subjected to cyclic loads. This shall be taken into account in the design and choice of materials, so that the possibility of fatigue failure is minimised.

For some devices subject to compression loads, e.g. tension/pressure elements and long bridge stackers, buckling strength may have to be considered.

1.10.3 Prototype testing

Type approval certificates are issued after satisfactory prototype tests have been carried out. Integral support fittings may, upon special consideration, be exempt from prototype testing.

.1 Prototype testing of each item shall be performed on at least two samples. Test loads shall be applied in a test rig simulating the actual service conditions. All test samples shall withstand at least the specified minimum breaking strength. A test result report describing the test arrangement, supports, test angles, applied loads and results shall be issued.

.2 For support fittings which are to be welded into the hull structure, the test condition shall simulate the welded, in-service condition.

.3 Prototype testing may be replaced by suitable calculations in cases wheretesting is impractical, e.g. for certain types of integral support

fittings.

1.11 Cargo Securing Manual Validity and Approval:

1.11.1 Once approved, the Cargo Securing Manual for a particular ship remain valid unless there are major changes and alterations that have been made on the general structure and intended use of the ship. In this case, an amended Cargo Securing Manual reflecting such changes/alterations shall have to be submitted or review, evaluation and approval of the Administration.

1.12. References

1.12.1. SOLAS 1974, as amended, Chapter VI/2, VI/5 and VII/5

1.12.2. IMO, MSC.1/Circ.1353/Rev.1 Revised Guidelines for the Preparation of the Cargo Securing Manual

1.12.3. The Code of Safe Practice for Cargo Stowage and Securing (CSS Code)

1.12.4. IMO MSC.1/Circ.1353/Rev.1 Revised Guidelines for the Preparation of the Cargo Securing Manual

1.13. Records

1.13.1. The requested form for Survey from Company

1.13.2. The survey reports after survey

1.13.3. The other documents related to a survey

1.13.4. The Relevant Copy of Cargo Securing Manual

The records shall be retained for a minimum period of 5 years.

Department of Marine Administration
Ministry of Transport and Communications
Republic of the Union of Myanmar

GUIDANCE FOR THE SAFE PRACTICE FOR CARGO STOWAGE AND SECURING

2014

Introduction

1. This Guidance for the Safe Practice for Cargo Stowage and Securing applies to shipping companies and their employed on Myanmar flagged ships.

2. The primary purpose is to ensure that all cargo units, including containers, are loaded, stowed and secured throughout the voyage in accordance with the ship's approved cargo securing manual.

3. Administration directs that measures are established by shipping companies and ship masters in accordance with Chapter VI and VII of the International Convention for the Safety of Life at Sea (SOLAS), 1974 as amended.

4. This Guidance for the Safe Practice for Cargo Stowage and Securing is set out on 7th October 2014 according to the directive 11/2014 in the exercise of the power of Section 294 (B), paragraph (b) of Myanmar Merchant Shipping Act 1923, as amended.

Guidance for the Safe Practice for Cargo Stowage and Securing

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1.4.1. The **Ship's Master** is responsible for

.1 receiving cargo information from the Shipper, appropriate information on the cargo sufficiently in advance of loading to enable the precautions which may be necessary for proper stowage and safe carriage of the cargo to be put into effect before commencement of loading of cargo at a port.

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(a) a general description of the cargo;

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(d) the information specified in paragraph 1.9 of this procedure.

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The Surveyor will, upon written request, if satisfied that compliance with a requirement of the CSS Code or this Procedure would in a particular case be unreasonable or impracticable, allow exemption in relation to a ship or a cargo from compliance with such requirement or provision to such extent and subject to such conditions as that officer determines.

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1.2.1 This chapter shall 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."

.8 The Cargo Safe Access Plan (CSAP) is intended to provide detailed information for persons engaged in work connected with cargo stowage and securing. Safe access should be provided and maintained in accordance with this plan.

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:

.1 name of manufacturer;

.2 type designation of item with simple sketch for ease of identification;

.3 material(s);

.4 identification marking;

.5 strength test result or ultimate tensile strength test result;

.6 result of non destructive testing; and

.7 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 device, as far as practicable. The appropriate documentation should include information as applicable regarding:

.1 name of manufacturer;

.2 type designation of item with simple sketch for ease of identification;

.3 material(s), including minimum safe operational temperature;

.4 identification marking;

.5 strength test result or ultimate tensile strength test result;

.6 result of non destructive testing; and

.7 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 tensionless (e.g. turnbuckles, chain tensionless, 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.

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

.1 procedures for accepting, maintaining and repairing or rejecting cargo securing devices; and

.2 record of inspections.

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

.4 Computerized maintenance procedures may be referred to in this sub-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-charter 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 meta centric 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

meta centric 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

.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.

.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 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. wood pulp, paper rolls, etc.), heavy weight cargoes, cars and other vehicles.

3.4 Supplementary requirements for ro - ro ships

.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.

.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 the SOLAS Convention, this cargo shall be stowed and secured in accordance with a Cargo Securing Manual, approved by the Administration.

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.e. stowage within or without cell guides) 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.

.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 athwart ship 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 ecuring 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.

.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.

.3 Other allowable stowage patterns

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

.2 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.

4.3 Forces acting on cargo units

.1 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.

.2 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.

5 CARGO SAFE ACCESS PLAN (CSAP)

.1 Ships which are specifically designed and fitted for the purpose of carrying containers should be provided with a Cargo Safe Access Plan (CSAP) in order to demonstrate that personnel will have safe access for container securing operations. This plan should detail arrangements necessary for the conducting of cargo stowage and securing in a safe manner. It should include the following for all areas to be worked by personnel:

.1 hand rails;

.2 platforms;

.3 walkways;

.4 ladders;

.5 access covers;

.6 location of equipment storage facilities;

.7 lighting fixtures;

.8 container alignment on hatch covers/pedestals;

.9 fittings for specialized containers, such as reefer plugs/ receptacles;

.10 first aid stations and emergency access/egress;

.11 gangways; and

.12 any other arrangements necessary for the provision of safe access.

.2 Guidelines for specific requirements are contained in annex 14 to the CSS Code.

1.9. Cargo Information

1.9.1 Prior to shipment the shipper shall provide all necessary information about the cargo to enable the ship owner or ship operator to ensure that:

1. the different commodities to be carried are compatible with each other or suitable separated;
2. the cargo is suitable for the ship;
3. the ship is suitable for the cargo; and
4. the cargo can be safely stowed and secured on board the ship and transported under all expected conditions during the intended voyage.

1.9.2 The master should be provided with adequate information regarding the cargo to be carried so that its stowage may be properly planned for handling and transport.

1.10 Type approval for Cargo Securing Device

1.10.1 Administration may accept Type approval which is based on plan approval and prototype testing, issued by Recognized Organization or Class Society. Type approval scheme consists of two alternatives, with two different certificate:

(1) Type approval certificates are based on a review of the design, i.e. plan approval, and are issued for products that have been manufactured and prototype tested, and is only valid for the one manufacturing plant. Certificates are valid for 2 or 4 years and will be entered in the Recognized Organization or Class Society's register of Approved Products and Manufacturers.

(2) Design assessment for type approval certificates are based only upon a review of the design of a component. However, before any product certificates for securing devices can be issued based on this scheme, prototype tests have to be carried out. Normally, prototype tests have to be done by each manufacturer of a product, but after special consideration the Recognized Organization or Class Society may accept that prototype testing not be repeated when production is started by a new manufacturer. Design assessment for type approval certificates are valid for 4 years.

Manufacturers that produce components covered by a design assessment for type approval certificate can, upon request, be given a type approval certificate. This certificate will always refer to the holder

of the design assessment for type approval certificate, and does not give the manufacturer any right to manufacture the product without the consent of the designer. Such type approval is recommended for products that are produced in series or where the designer and manufacturer expect repeat orders.

One type approval or design assessment for type approval certificate may cover different variations of the same basic type of device. Variations may include e.g. different materials, lengths or breaking loads. Each variation may have to be prototype tested.

1.10.2 Plan Approval

Approval will be based on an evaluation of the strength of each securing device, as described in the following subsections. However, factors related to safe use will also be considered:

1. Securing devices that function as mechanisms must have safe and reliable operation throughout their operational lifespan.
2. The risk of incorrect application of securing devices should be minimized through design, marking or labeling and user instructions.
3. For devices that may have small margins against malfunction or failure, a more detailed analysis of safety will be considered; such smaller margins may for instance be related to:
   - wear or corrosion
   - small contact areas for load transfer
   - difficult or impossible verification that the device is properly attached and locked after application
   - enhanced need for maintenance.

   Cargo securing devices may be subject to tension, compression or shear forces, or combinations thereof. The forces may be static or dynamic.

   However, during prototype testing the test specimens will normally be subject to one type of static force at a time.

   During operation, securing devices are normally subjected to cyclic

loads. This shall be taken into account in the design and choice of materials, so that the possibility of fatigue failure is minimized.

For some devices subject to compression loads, e.g. tension/pressure elements and long bridge stackers, buckling strength may have to be considered.

1.10.3 Prototype testing

Type approval certificates are issued after satisfactory prototype tests have been carried out. Integral support fittings may, upon special consideration, be exempt from prototype testing.

.1 Prototype testing of each item shall be performed on at least two samples. Test loads shall be applied in a test rig simulating the actual service conditions. All test samples shall withstand at least the specified minimum breaking strength. A test result report describing the test arrangement, supports, test angles, applied loads and results shall be issued.

.2 For support fittings which are to be welded into the hull structure, the test condition shall simulate the welded, in-service condition.

.3 Prototype testing may be replaced by suitable calculations in cases wheretesting is impractical, e.g. for certain types of integral support fittings.

1.11 Cargo Securing Manual Validity and Approval:

1.11.1 Once approved, the Cargo Securing Manual for a particular ship remain valid unless there are major changes and alterations that have been made on the general structure and intended use of the ship. In this case, an amended Cargo Securing Manual reflecting such changes/alterations shall have to be submitted or review, evaluation and approval of the Administration.

1.12. References

1.12.1. SOLAS 1974, as amended, Chapter VI/2, VI/5 and VII/5

1.12.2. IMO, MSC.1/Circ.1353/Rev.1 Revised Guidelines for the Preparation

of the Cargo Securing Manual

1.12.3. The Code of Safe Practice for Cargo Stowage and Securing (CSS Code)

1.12.4. IMO, Res.A.714(17) Code of Safe Practice for Cargo Stowage and Securing

1.12.5. IMO Res.A.489(XII) Safe stowage and securing of cargo units and other entities in ships other than cellular container ships

1.12.6. IMO MSC/Circ.745 Guidelines for the preparation of the cargo securing manual

1.12.7. IMO Res.A.533(13) Elements to be taken into account when considering the safe stowage and securing of cargo units and vehicles in ships

1.12.8. IMO Res.A.581(14) Guidelines for securing arrangements for the transport of road vehicles on ro-ro ships

1.12.9. IMO/ILO/UNECE Guidelines for packing of cargo transport units

1.12.10. IMO Res.A.864(20) Recommendations for entering enclosed spaces aboard ships

1.12.11 IMO MSC.1/Circ.1353/Rev.1 Revised Guidelines for the Preparation of the Cargo Securing Manual

1.13. Records

1.13.1. The requested form for Survey from Company

1.13.2. The survey reports after survey

1.13.3. The other documents related to a survey

1.13.4. The Relevant Copy of Cargo Securing Manual

The records shall be retained for a minimum period of 5 years.