

Subject :

**Implementation Scheme of Upgraded
Requirements for Existing Bulk Carriers**

NKTECHNICAL INFORMATION

No. : 234

Date : 11 November 1997

To Ship Owners and Shipyards Concerned

As informed by Technical Information No.220 (dated 30 July 1997), the work on the Safety of Bulk Carrier with regard to the technical aspects is almost completed in IACS.

There are some differences found between IACS unified requirements and SOLAS amendments which have been approved in IMO MSC 68 regarding the definition of "New ship/ Existing ship" and the implementation scheme for Existing Ship. Regarding the differences between IACS's draft and IMO's draft, IACS has aligned their some own requirements to IMO requirements and finally agreed to implement an idea of the new requirements in advance of IMO from the viewpoint of importance of upgraded safety level and its early implementation.

According to this advanced implementation within IACS, the Society has just started the job to incorporate the said IACS unified requirements with the Society's rules. The outline of these requirements and the flowchart on how to apply these requirements are shown in the Attachment with respect to the retroactive application of the following requirements for the existing bulk carriers contracted for construction before 1 July 1998.

- Structural/stability requirements against the flooded condition in the foremost cargo hold by the timing mentioned in the following table
- Requirements on Loading Manual and Loading Computer by 1 July 1998

Implementation for Retroactive Application of New IACS Unified Requirements, UR S19,22&23

ship's age on 1 July 1998 (A)	implementation scheme
$20 \text{ years} \leq A$	the due date of first Intermediate Survey(IS) or Special Survey(SS) after 1 July 1998, whichever comes first.
$10 \text{ years} \leq A < 20 \text{ years}$	the due date of the 3 rd SS*, or above, to be held during the period 1 July 1998 to 1 July 2003 at the latest
$A < 10 \text{ years}$	the due date of the 3 rd SS*

(Note) : Early completion of a SS or IS** coming due after 1 July 1998 to postpone compliance is not permitted. (*: The Special Survey required for the ships between 10 and 15 years old **: For the ships 20 years old or over)

In addition to the field survey to confirm the compliance with the subject requirements which is based on the application made by the ship's owners, the Society will provide the following services.

ClassNK NIPPON KAIJI KYOKAI
4-7, KIOI-CHO, CHIYODA-KU,
TOKYO 102, JAPAN.

TELEX : 22975 CLASSNKJ
2324280 CLASNKJ
CABLE : CLASSNK TOKYO

1. The notification of the result of assessment for the structural requirements (Dept. in charge : Survey Department at Fax. +81 3 5226 2029) (free of charge)

With regard to the strength of the aft. corrugated bulkhead and double bottom structure in way of the foremost cargo hold, the Society assesses the compliance with the structural requirements (IACS UR S19&22) for each subject ship and informs ship's owners of the result. This notification will be made for the particular ship in order of ship's age with free of charge. The ship's owners are invited to refer to this result as information for the arrangement of compliance and renovation work required.

2. The examination of the damaged stability calculation booklet for the condition when the foremost cargo hold is flooded (Dept. in charge : at Hull Department Fax. +81 3 5226 2019) (charged)

The ship's owners are invited to submit the damaged stability calculation booklet for the required condition with the application for our examination to confirm the compliance with the requirement. In case where the preparation of calculation booklet is difficult to arrange, the Society would offer the such service at the owner's request with additional charge.

3. The approval of Loading Manual (Dept. in charge : at Hull Department Fax.+81 3 5226 2019) (charged)
The ship's owners are invited to submit the Loading Manual with the application for our examination regarding the followings.

- ① Approval for the addendum to detail the loading/unloading sequences (para.3.1 in Attachment)
- ② Approval for the revision for the loading condition with the reduced cargo weight or the modification of cargo distribution (para.3.2 in Attachment)

Please feel free to contact the Survey Department at the Head Office of the Society for further details at Fax. +81 3 5226 2029.

Attachment : Additional Requirements for Existing Bulk Carriers

Additional Requirements for Existing Bulk Carriers

(The flowchart on how to apply the requirements is shown in the attached flowchart.)

The SOLAS requirements referred to in this text with [] are based on the outcome of the MSC 68 meeting and subject to confirmation at SOLAS Conference in November 1997.

1. Structural Requirements for the Condition when Foremost Cargo Hold Flooded

(SOLAS Chapt.XII-Reg.6 and Strength Standard, IACS-UR S19&22)

These requirements are applicable to existing single side skin bulk carriers of 150 m (Lf) in length and above carrying bulk cargoes having bulk density of 1.78 t/m³* and above. (*: loading cargo weight / loading cargo capacity, i.e. reciprocal of Storage Factor (m³/t))

1.1 Aft. bulkhead of foremost cargo hold (IACS UR S19)

(1) Corrugation plates in the lower part(15% height from lowest end) and middle part(15% to 70% height from lowest end)

Steel renewal or reinforcement is required depending on the following relationship between the gauged thickness (g/t) and the required net thickness (t_{net}). The required net thickness (t_{net}) will be notified by the Society. The draft IACS guidance for the thickness measurement for this purpose is shown as Appendix 1.

(a) $g/t < t_{net} + 0.5 \text{ mm}$

Steel renewal with minimum thickness of $t_{net} + 2.5 \text{ mm}$ is required in principle. However, doubling strips may be accepted to compensate the required bending capacity. The reduced cargo weight or modification of cargo distribution (non-homo. to homo.) may also be alternative measures to steel renewal or reinforcement in case where the proposed condition is evaluated to satisfy the requirements. For the modification of the loading condition, the re-assessment of the structure, re-approval of loading manual [and marking with Δ on each side of the shell] are required.

(b) $t_{net} + 0.5 \text{ mm} \leq g/t \leq t_{net} + 1.0 \text{ mm}$

Thickness gauging at annual interval or coating work according to manufacturers requirements specified in the same way as those at new construction including surface preparation is required for the subject area.

(2) Lower stool slant plate / double bottom floor* (*: if no lower stool is fitted)

In cases where the original thickness of lower stool slant plate / double bottom floor* is smaller than the required thickness(t_{req}), the slant plate / double bottom floor* is required to be reinforced by doubling strips or shedder and gusset plates on corrugated bulkhead plates up to 10% height from the lower end of the bulkhead plates. The required thickness (t_{req}) will be notified by the Society.

1.2 Double bottom construction (IACS UR S22)

In case where the construction is not satisfied with the requirement, reinforcement on girders and/or floors such as doubling plates is required. The result of assessment for the compliance with the requirements will be notified by the Society.

2. Damaged Stability for the Condition when Foremost Cargo Hold Flooded

([SOLAS Chapt.XII-Reg.4.2 and Res.A.320 [ILLCReg.27]] , [IACS-UR S23])

This requirement is applicable to existing single side skin bulk carriers of more than 150 m (Lf) in length and above carrying bulk cargoes having bulk density of 1.78 t/m^3 * and above. (*: loading cargo weight / loading cargo capacity, i.e. reciprocal of Storage Factor (m^3/t))

2.1 The ship of freeboard type of “B-60” or “B-100” may be considered as complying with this requirement.

2.2 The ship shall comply with the following criteria shall be complied with at the final stage of the assumed flooded condition of the foremost cargo hold.

- (a) The final waterline shall be below the lower edge of prescribed openings,
- (b) The metacentric height shall be positive and
- (c) The righting lever shall be at least 0.1 m within the 20 degrees range of GZ curve and the area under the curve within this range shall not be less than 0.0175 m-rad.

3. Addendum to and Revision of Loading Manual for Loading/Unloading Sequence and for Modification of Loading Condition

(IACS-UR S1A)

This requirement is, irrespective of bulk density, applicable to existing single side skin bulk carriers of more than 150 m (Lf) in length and above.

3.1 The typical loading sequences shall be developed paying due attention to the loading rate, the deballasting capacity and applicable strength limitation and the result shall be attached to the existing Loading manual. The example form for this purpose is shown in Appendix 2.

3.2 The loading manual shall be revised in cases where the loading amount is reduced or loading condition is modified according to para.1.1(1)(a).

3.3 [The “Loading Information Booklet” required in SOLAS Chapt.VI Reg.7(as shown in Appendix 3) which is expected to enter into force on 1 July 1998 shall also include the above requirement 3.1 and 3.2. This booklet shall be endorsed on compliance with above 1. and 2. (SOLAS Chapt.XII Reg.8)]

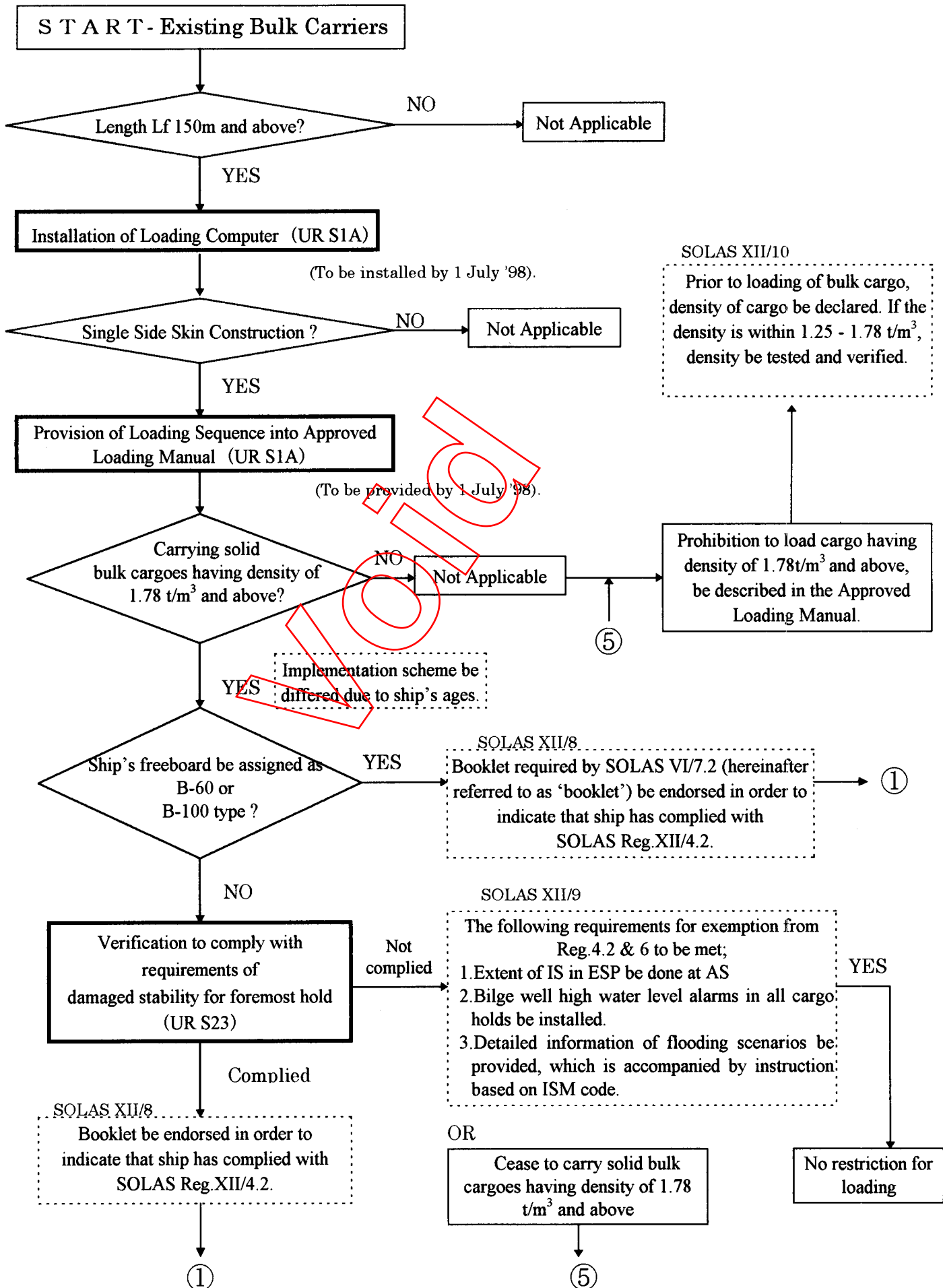
4. Loading Computer

(IACS-UR S1A)

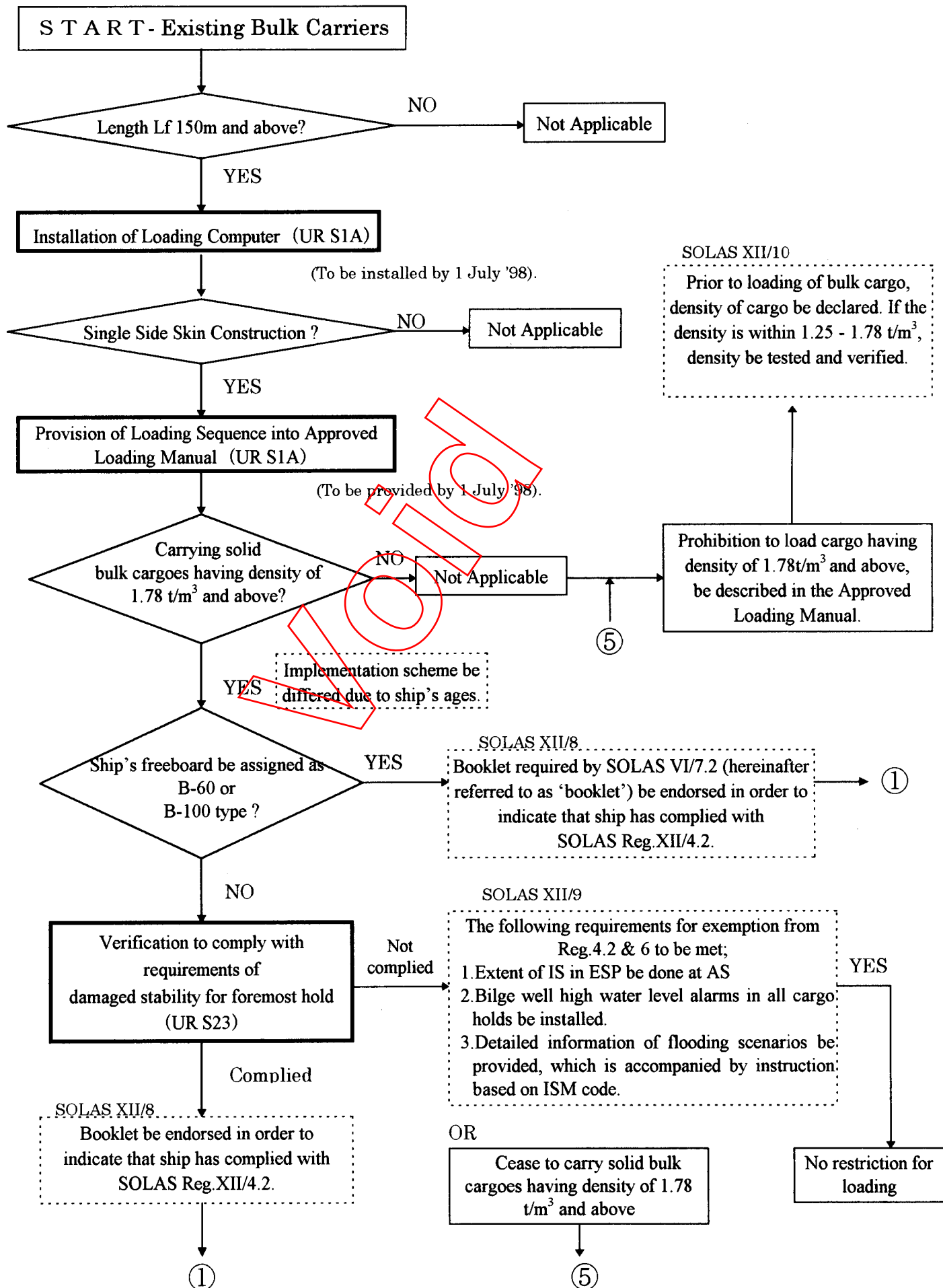
This requirement is, irrespective of bulk density or type of side structure (single skin / double skin), applicable to existing bulk carriers of more than 150 m (Lf) in length and above.

4.1 As instructed in Technical Information No.210, in addition to a Loading Manual, a Loading Computer shall be installed on board to calculate the longitudinal bending moment and sheering force for various loading conditions.

Flowchart for Application of the Rules to Existing Bulk Carriers (IACS UR S1A, S19, S22 and S23)



Flowchart for Application of the Rules to Existing Bulk Carriers (IACS UR S1A, S19, S22 and S23)



Appendix 1

ANNEX III to Z10.2

Guidelines for the Inspection of the Transverse Corrugated Bulkhead between Hold Nos. 1 and 2.

1. Gauging is necessary to determine the general condition of the structure and to define the extent of possible repairs and/or reinforcements of the transverse corrugated bulkhead for verification of the compliance with UR S19.
2. The bulkhead is divided into zones 1 and 2 over the breadth. For each zone, the gauging is to be carried out at the three levels as described below. To adequately represent the nature and extent of any corrosion and/or wastage of the respective structure, not less than 50% of the locations have to be gauged.

Level (a) *Ships without lower stool (see Figure 1):*

Location:

- The mid-breadth of each corrugation flange at approximately 200 mm above the line of shedder plates;
- The middle of gusset plates between corrugation flanges, where fitted;
- The middle of each shedder plate;
- The mid-breadth of each corrugation web at approximately 200 mm above the line of each shedder plates;

Level (b) *Ships with lower stool (see Figure 2):*

Location:

- The mid-breadth of each corrugation flange at approximately 200 mm above the line of shedder plates;
- The middle of gusset plates between corrugation flanges, where fitted;
- The middle of each shedder plate;
- The mid-breadth of each corrugation web at approximately 200 mm above the line of each shedder plates;

Level (c) *Ships with and without lower stool (see Figures 1 and 2):*

Location:

- The mid-breadth of each corrugation flange and web at about the mid-height of the corrugation.
3. Where the thickness changes within the horizontal levels, the thinner plate is to be gauged.
 4. Steel renewal/and or reinforcement is to comply with S19.

FIGURE 1 & 2 TO ADD

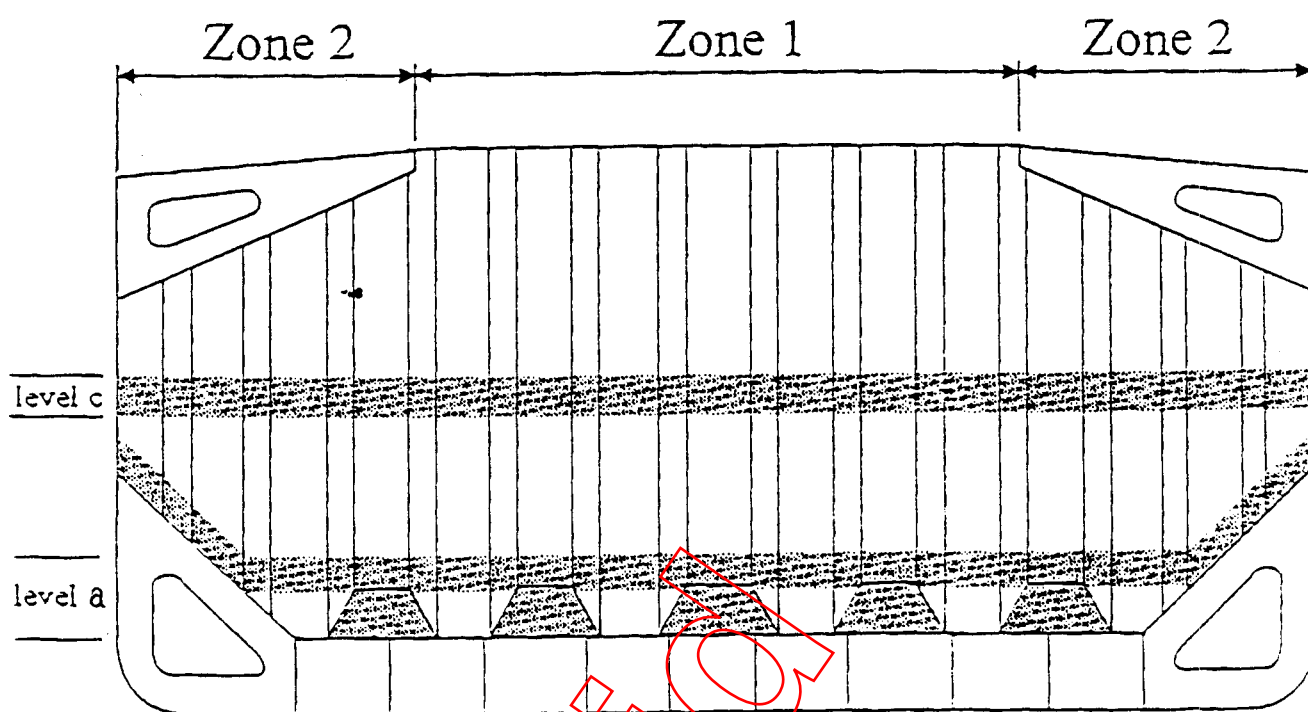


Figure 1

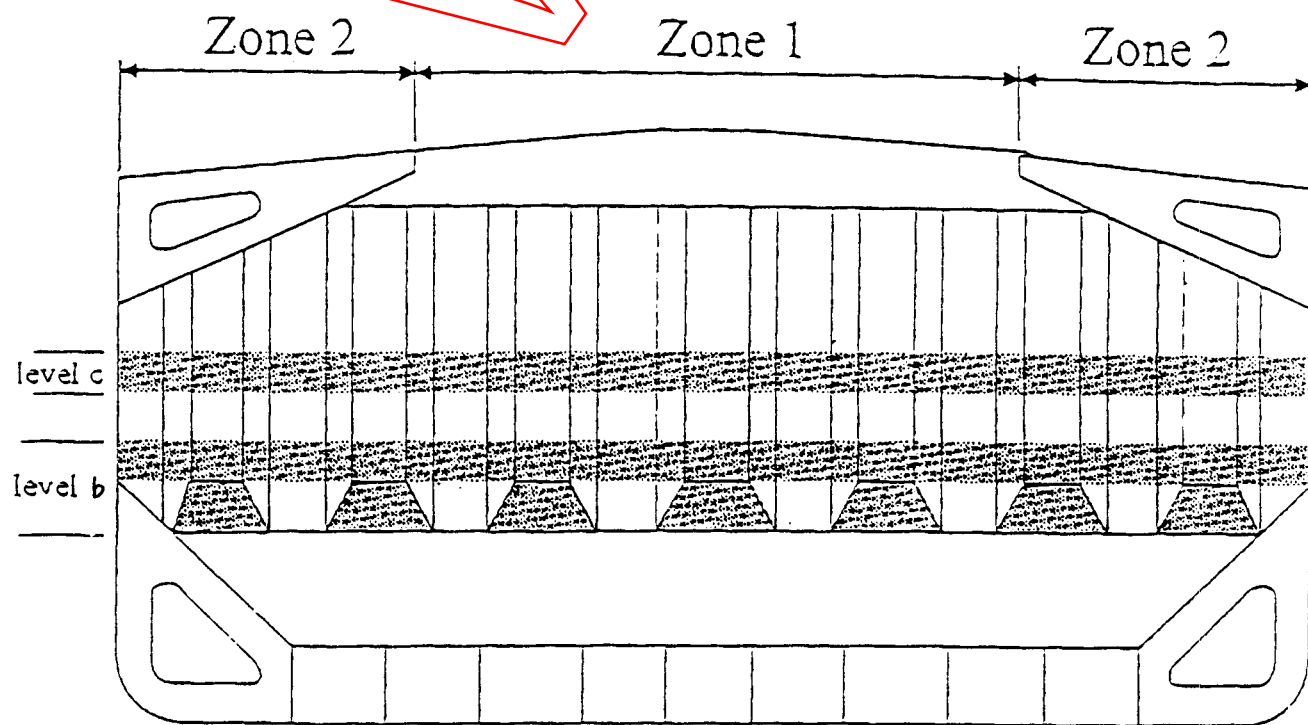
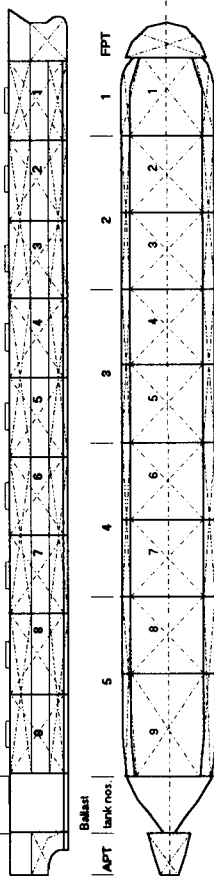


Figure 2

Vessel name:	Yard:	ber:
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[illegible]

	Hold content at commencement of loading/discharging			
Cargo mass				
Density (Nm3)				
Grade				

[illegible]

Cargo mass		Hold content at end of loading/discharging	
		Total mass loaded/discharged (t)	

	Maximum occurring values among all conditions above				
Net load on Double Bottom					
Net load in two adjacent holds					

Approved by:

$\text{Net load on double bottom} = (Mh/V) \cdot h \cdot T \quad (\text{tm}^2)$
 - where: Mh = Mass in hold + mass in DB (t)
 V = Total volume of hold (m^3)
 h = height of hold from inner bottom to top of
 T = draught (m)

Place, date, stamp and sign

- ~~3 assembling passengers at muster stations;~~
- .4 keeping order in the passageways and on the stairways and generally controlling the movements of the passengers; and
- .5 ensuring that a supply of blankets is taken to the survival craft.
- 7 The muster list shall be prepared before the ship proceeds to sea. After the muster list has been prepared, if any change takes place in the crew which necessitates an alteration in the muster list, the master shall either revise the list or prepare a new list.
- ~~8 The format of the muster list used on passenger ships shall be approved."~~

CHAPTER VI

CARRIAGE OF CARGOES

Regulation 2 - Cargo information

- 9 Existing subparagraph 2 of paragraph 2 is replaced by the following:
- "2 in the case of bulk cargo, information on the stowage factor of the cargo, the trimming procedures, likelihood of shifting including angle of repose, if applicable, and any other relevant special properties. In the case of a concentrate or other cargo which may liquefy, additional information in the form of a certificate on the moisture content of the cargo and its transportable moisture limit."

Regulation 7 - Stowage of bulk cargo

- 10 The existing text of regulation 7 is replaced by the following:

"Regulation 7 Loading, unloading and stowage of bulk cargoes"

- 1 For the purpose of this regulation, *terminal representative* means a person appointed by the terminal or other facility, where the ship is loading or unloading, who has responsibility for operations conducted by that terminal or facility with regard to the particular ship.

Refer to the Code of Practice for the Safe Loading and Unloading of Bulk Carriers to be developed for adoption by the twentieth session of the Assembly of the Organization.

2 To enable the master to prevent excessive stresses in the ship's structure, the ship shall be provided with a booklet, which shall be written in a language with which the ship's officers responsible for cargo operations are familiar. If this language is not English, the ship shall be provided with a booklet written also in the English language. The booklet shall, as a minimum, include:

- .1 stability data, as required by regulation II-1/22 ;
- .2 ballasting and deballasting rates and capacities;
- .3 maximum allowable load per unit surface area of the tank top plating;
- .4 maximum allowable load per hold;
- .5 general loading and unloading instructions with regard to the strength of the ship's structure including any limitations on the most adverse operating conditions during loading, unloading, ballasting operations and the voyage;
- .6 any special restrictions such as limitations on the most adverse operating conditions imposed by the Administration or organization recognised by it, if applicable; and
- .7 where strength calculations are required, maximum permissible forces and moments on the ship's hull during loading, unloading and the voyage.

3 Before a solid bulk cargo is loaded or unloaded, the master and the terminal representative shall agree on a plan¹ which shall ensure that the permissible forces and moments on the ship are not exceeded during loading or unloading, and shall include the sequence, quantity and rate of loading or unloading, taking into consideration the speed of loading or unloading, the number of pours and the deballasting or ballasting capability of the ship. The plan and any subsequent amendments thereto shall be lodged with the appropriate authority of the port State.

4 Bulk cargoes shall be loaded and trimmed reasonably level, as necessary, to the boundaries of the cargo space so as to minimize the risk of shifting and to ensure that adequate stability will be maintained throughout the voyage.

5 When bulk cargoes are carried in 'tween-decks, the hatchways of such 'tween-decks shall be closed in those cases where the loading information indicates an unacceptable level of stress of the bottom structure if the hatchways are left open. The cargo shall be trimmed reasonably level and shall either extend from side to side or be secured by additional longitudinal divisions of sufficient strength. The safe load-carrying capacity of the 'tween-decks shall be observed to ensure that the deck-structure is not overloaded.

6 The master and terminal representative shall ensure that loading and unloading operations are conducted in accordance with the agreed plan.

¹ Refer to the Code of Practice for the Safe Loading and Unloading of Bulk Carriers to be developed for adoption by the twentieth session of the Assembly of the Organization.

7 If during loading or unloading any of the limits of the ship referred to in paragraph 2 are exceeded or are likely to become so if the loading or unloading continues, the master has the right to suspend operation and the obligation to notify accordingly the appropriate authority of the port State with which the plan has been lodged. The master and the terminal representative shall ensure that corrective action is taken. When unloading cargo, the master and terminal representative shall ensure that the unloading method does not damage the ship's structure.

8 The master shall ensure that ship's personnel continuously monitor cargo operations. Where possible, the ship's draught shall be checked regularly during loading or unloading to confirm the tonnage figures supplied. Each draught and tonnage observation shall be recorded in a cargo log-book. If significant deviations from the agreed plan are detected, cargo or ballast operations or both shall be adjusted to ensure that the deviations are corrected."

~~CHAPTER XI~~

~~SPECIAL MEASURES TO ENHANCE MARITIME SAFETY~~

Regulation 1 - Authorization of recognized organizations

11 The existing text of the regulation is replaced by the following:

"Organizations referred to in regulation I/6 shall comply with the Guidelines adopted by the Organization by resolution A.739(18), as may be amended by the Organization and the Specifications adopted by the Organization by resolution A.789(19), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I."
