

Subject :

Requirements to be met by vessels entering into Greek Ports carrying solid cargoes in bulk

NKTECHNICAL INFORMATION

No. : 333

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To ship owners and shipbuilders concerned

The Greek Government issued a circular 1421 ΓΝΓ23/50/98 entitled "Loading, Unloading and carriage of Bulk Cargoes by Ships". Annex 2. shows its provisional translation into English. According to the circular, the vessels entering into or leaving Greek ports carrying solid cargoes in bulk should meet the requirements of IMO Resolution A.862(20) and, especially, the vessels carrying cement in bulk (excluding pure cement carrier) should submit documents to Greek port authorities which are specified by the Greek Rules "Safety Rules for Carriage of Cement in the Form of Bulk Cargo by Ships" that is appended to the circular. Please refer to the outlines of the rules in the Annex 1. As mentioned in the Annex 1 at item 4, in cases where vessels carry cement cargoes with angle of repose greater than 30° and less or equal to 35°, the vessels are required to submit, as one of the documents to be submitted, intact stability calculation prepared in accordance with Appendix "A" to the Greek Rules. The rule requires that the calculation should be approved by the Greek Administration or authorized classification societies. (However, if vessels satisfy the conditions specified by item 7 of the outline of the Rule(Annex 1), the vessels are exempted from submitting the documents.) This Society is ready to approve the calculation on behalf of the Greek Government on request.

If you have any questions, please contact the Hull Department at the following telephone No. or fax No.: Tel: 03-5226-2018 Fax: 03-5226-2019

Attachments :

- Annex 1. The outlines of the Greek Rules "Safety Rules for Carriage of Cement in the Form of Bulk Cargo by Ships"
- Annex 2. The circular 1421 ΓΝΓ23/50/98 issued by Greek Government (Provisional translation)

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Outlines of the Greek Rule “Safety Rules for Carriage of Cement in the Form of Bulk Cargo by Ships”

Captains of vessels carrying cement in bulk should submit the following documents to the port authority before leaving Greek ports. (Requirement of Part C of the rules)

1. Declaration assuring the following data of the cargoes to be loaded
 - 1) The name and the number of registry of the ship.
 - 2) The kind of cement (commercial names) of the quality.
 - 3) The place of loading.
 - 4) The total quantity to be loaded (t).
 - 5) The place(s) to be unloaded and the quantities to be unloaded at the place(s).
 - 6) The mode of transfer from the terminal to the ship.
 - 7) The true specific gravity of cement (Kg/ l).
 - 8) Apparent specific gravity (t/ m^3), as well as the stowage factor (m^3/t).
 - 9) Angles of repose of cement and also methods and reports of the measurement.
 - 10) The Statement signed by the Head of the Laboratory where the measurements were conducted, certifying that the data of the physical properties that have been provided were measured with accuracy and that they are credible.
 - 11) The statement signed by representatives of the loading terminal, certifying that, the contents of the Declaration are true and correct and that the data measured at/by the Laboratory, correspond correctly and they represent the properties of the specific quantity of cement, which is going to be loaded on the ship.
 - 12) The statement signed by the Captain certifying that he has received the statement of the laboratory, and that the data provided in it are used for the calculation of loading and stability. The measurements must be made by the method which is described in the specification D.2.1 or D.2.2 of BC Code. The statement should also reports as to which method was used for the measurements.
2. A Statement in writing, by the Director of the terminal, in which the representative of the Loading Terminal must be specified by name.
 3. A document certifying that SOLAS Chapter IV “Carriage of Grain” is complied with in cases where cargoes with angle of repose less than 30° are loaded.
 4. A document certifying that APPENDIX A to this rule is complied with in cases where cargoes with angles of repose greater than 30° and up to 35° are loaded. (This is not required in case of cargoes with the repose angle greater than 35°)
 5. Loading plans signed by the Captain.
 6. A Captain’s report stating that cargoes have been trimmed in complying with Appendix B.
 7. The documents mentioned by the aforementioned items 3,4 and 6 are not necessary to submit if the all of the following conditions were met:
 - 1) The repose angles of all cement cargoes are greater than 30° ;
 - 2) The wind force in the area in which the ship is to sail does not exceed 7 of Beaufort scale according to the forecast at the time of departure of the ship; and
 - 3) A declaration is signed and submitted by the captain in which he must declare that
 - a) two hours have elapsed from the time when loading of the ship finished; and
 - b) a deviation of the course of the ship to safe anchorage or to another area, where there are better weather conditions, if during the sail he comes across sea conditions which are harder than the one which corresponds to wind force greater than 7 of Beaufort scale.
 8. Copies of the declaration required by the above item 1 should be kept on board the vessel and in the company which is in charge of the management of the vessel until the end of next year.

(Emblem of the Hellenic Republic)

HELLENIC REPUBLIC

MINISTRY OF MERCHANT MARINE

DIRECTORATE OF : MERCHANT SHIPS INSPECTORATE
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Piraeus, 28-12-1998 (n. eight)

Our Ref. No.: 1421.FNF.23/50/98

To: See attached Distrib. Table

SUBJECT: Loading, Unloading and Carriage of Bulk Cargoes by Ships.

REF. (a) Resolution No.: A.749(18) of the IMO.

(b) Resolution No.: A.862(20) of the IMO. ("Code of Practice for the Safe Loading & Unloading of Cargo Ships with [Solid] Bulk Cargoes").

(c) P.D; [Presidential Decree (Order)] No.: 852/76 (Published in the Government Gazette [of the Hellenic Republic] in Issue No.: 312 A')

1. It is generally known that, the carriage of bulk cargoes by cargo ships is subject to special safety measures, so that the/any danger for the ship and the persons aboard, arising from shifting of the cargo, to be limited (i.e. minimized).

2. But, it has been proved that, danger for the whole carriage, is directly related to the procedure(s) which is(are) followed during the loading of the ship at the terminals, and also to those followed during the unloading of the ship at the delivery terminal.

3. In order to limit (i.e. to minimize) the risks of accidents

during the carriage, and also during the procedures of loading and unloading of bulk cargoes, the IMO has prepared and it has already issued its Resolution mentioned in Ref. (b) above, which concerns the "Code of Practice for the Safe Loading and Unloading of Cargo Ships with [Solid] Bulk Cargoes" (which was recently published in the special edition [issue] of IMO-1998: ISBN 92-801-1458-1), that must be observed [followed] by both the ships and also by the land installations [i.e. terminals] operators, for the safe loading and unloading of cargo ships with bulk cargoes, encouraging the Member States to apply [or to enforce] the aforementioned Code.

4. In parallel, after the accidents which happened on ships which were carrying cement in the form of bulk cargo the competent Service of the Ministry of Merchant Marine (i.e. the Directorate of Merchant Ships Inspectorate) prepared a Draft [Plan] of Safety Rules for the carriage of cement as bulk cargo by ships.

The said Draft [of Safety Rules], contains a set of instructions which must be observed [followed] by the involved [Ship] Masters, Ship-owners, Outfitters, Persons in charge of Loading and by those who are in charge of the Loading & Unloading Terminals, aiming at the upgrading (i.e. the improvement) of the safety of the ships of that particular category (type).

5. In view of the above facts, we hereby forward to you a copy of the aforementioned Code of the IMO in the Greek language and of the Draft of Safety Rules concerning the carriage of cement in the form of bulk cargo by ships, for the proper application of them on all the ships which are subject to them. The Port Authorities are hereby ordered to: (a) Duly notify [inform] in time, the Captains [Ship Masters], as well as the competent personnel [staff] who are

in charge of the terminals used for loading and unloading of bulk cargoes, within the area of jurisdiction [of the Port Authorities] and (b) Apply the relevant Code and the Rules from 01-2-1999 (from the 1st day of February, 1999 (ninety-nine)). More specifically, before granting the clearance [permission] to sail, [the aforesaid Port Authorities] will obtain and they will keep until the end of the voyage of the ship, the properly filled copies of Appendices 2 and 5 of the Code of the IMO, and they will apply the instructions given in Part Γ' (C) of the Rules, which determine the "PROCEDURES FOR GRANTING CLEARANCE [or PERMISSION] FOR SAIL".

6. The Authorized Organizations, are hereby requested to take the proper/required care for the application of the above.

7. The Ship-owners Associations are kindly requested to inform [notify] their members [accordingly].

STAVROS SOUMAKIS (Mr)

MINISTER OF MERCHANT MARINE

ATTACHED HEREWITH:

1. CODE OF THE I.M.O.
2. PLAN [DRAFT] OF SAFETY RULES.

N.B.: The rest of this page shows the Distribution Table, which IS NOT INCLUDED in the present Translation, upon request of the interested party.

MINISTRY OF MERCHANT MARINE
MERCHANT SHIPS INSPECTORATE

DIVISION: Γ' (C) NAVAL ARCHITECTURE

Piraeus, 26-11-1998 (n. eight)

SAFETY RULES

FOR THE CARRIAGE OF CEMENT IN THE FORM OF BULK CARGO BY SHIPS

PART A — INTRODUCTION

1. According to the assumptions of the International Code for the carriage of bulk cargoes (the BC Code), the angle of repose of 30° (thirty degrees) was taken as the limit for the classification of a ship in the enhanced stability criteria for "grain carriage" according to "SOLAS" (Chapter VI). Therefore, the cargoes such as cement, which have angles of repose greater than 30° as a rule and up to 35° (or even greater for some [certain] qualities of cement) are not the types of cargoes which would make it necessary for the ships used for their carriage, to meet the aforesaid criteria.

2. The assumptions of the BC Code include special measures for the limitation (i.e. for the minimization) of the probabilities of shifting of cargoes that have angle of repose greater than 30° and up to 35° inclusive, e.g. the appropriate trimming of the surface of the cargo in the hold.

3. Moreover, the English Rules governing the "instructions for the inspection of the load line" consider as possible the shifting of cargoes which have angle of repose up to 35° and they include criteria which aim at the enhancement (or the improvement) of the intact stability of the ships which are used for the carriage of such cargoes in bulk form.

4. Having taken into consideration the above facts, and aiming, at the improvement of the safety of ships of this category [type], our Service has prepared the instructions contained in Parts B and C [of this document] which must be observed (i.e. followed) by the involved Captains [Ship Masters], Ship-owners, Outfitters, Persons in charge of Loading and also by the Agents, who are in charge of the Loading and Unloading Terminals.

PART B - ENHANCEMENT [IMPROVEMENT] OF THE INTACT STABILITY OF THE CEMENT CARRYING SHIPS

1. ACQUISITION OF DATA CONCERNING THE CARGO

a. The Captain [Ship Master] is obliged, to request and obtain before the commencement of the loading procedure, from the Agent of the terminal, a Declaration [Statement] with (i.e. showing) the physical properties of each kind (type) of cement, which is to be loaded in the holds. The said Declaration [Statement] about the physical properties of the quantities of cement, which are planned to be loaded, must be signed by the Head of the Laboratory which conducted the relevant measurements by order of the Terminal Staff and also signed by the Agent who represents the loading terminal and by the Captain [Ship Master] who received such Declaration (or Statement)

b. The said Declarations [Statements], must be in/of standard forms, each one of which, must refer to only one kind [or type] of cement (that is, must be submitted as many Declarations/Statements as the kinds [types] of cement which are to be loaded on the ship) and each form must, with the care and the responsibility of the

Agent of the terminal, include (i.e. show):

- The name and the number of registry of the ship.
- The kind [type] of the cement (commercial names [brand names] of the quality (i.e. of the kind [type]) of the cement).
- The place of loading.
- The total quantity which is to be loaded on the certain ship (t).
- The place (or the places) of destination, and the corresponding quantities of the cargo which will be unloaded (t).
- The mode of transfer from the terminal to the ship.
- The true/actual specific gravity (or the true/actual specific weight) of cement (kg/l).
- The apparent specific gravity (or weight) (t/m^3), as well as the stowage factor (m^3/t).
- The angle of repose of cement and also the method of measurement and report which was used (D.2.1 or D.2.2).
- The Declaration [Statement] signed by the Head of the Laboratory where the measurements were conducted, certifying that the data of the physical properties that have been provided were measured with accuracy and that they are credible (i.e. true and correct).
- The Declaration [Statement] signed by the Agent of the terminal of loading, certifying that, the contents of the Declaration are true and correct and that the data measured [or found] at/by the Laboratory, correspond correctly and they represent [show] the properties of the specific quantity of cement, which is going to be loaded on the ship.
- The Declaration [Statement] signed by the Captain [Ship Master], certifying that he has received the Declaration [Statement] of the laboratory, and that the data provided in it, will be taken

into consideration for the calculation of loading and stability.

c. At this point, it is clarified that the measurements of the angle of repose, must be made and reported in the aforementioned Declarations [Statements] and mentioned as "the angle of repose by the method (or the test) of the tilting box", according to one of the two methods which are described in the specifications D.2.1 or D.2.2 of the "Code of safe practice for solid Bulk Cargoes" ("BC Code") of the I.M.O.. (Appendix D, p. 149-153, 1998 edition, ISBN 92-801-1463-8).

2. RULES FOR THE ENHANCEMENT [IMPROVEMENT] OF STABILITY

a. If by the Declarations [Statements] of the data of physical properties, results an angle of repose of 30° or less for at least one kind [type] of cement, then will apply the rules which concern the "carriage of grain" according to Chapter VI of SOLAS. For the application of this Chapter: (a) All the ships are considered to be "new" and (b) The ships which are specially constructed [built] for the carriage of cement, and which are not equipped with proper hold hatches equipped with systems of opening & closing, according to the load line regulations, are considered that they do not meet the requirements of the Chapter for cargo securing.

b. If by the Declarations [Statements] of the data of physical properties results an angle of repose greater than 30° and less or equal to 35° for at least one kind [type] of cement, and the rest of the kinds [types] of cement, which are to be carried have an angle of repose greater than 35°, then will apply the requirements of APPENDIX "A" and APPENDIX "B". Fulfilling/Meeting the criteria of APPENDIX "A", will be proved by means of standardized forms for

the calculation of the stability of the ship for the specific load status [condition] during the departure [sail] and the arrival and the said documents must be signed by the Captain [Ship Master] and attached with them must be the loading plan (also signed). In the documents for the calculation [of the ship s stability], must also be included a Declaration [Statement] by the Captain [Ship Master] who executed [prepared] such documents, certifying that all of the criteria (i.e. the requirements) of APPENDIX "A" of the present document have been met (i.e. fulfilled). Fulfilling the criteria [or requirements] of APPENDIX "B", shall be proved by means of the Special Report, signed by the Captain, which is mentioned in the said Appendix.

c. If by the Declarations [Statements] of the data of physical properties results an angle or repose greater than 35° for all the the kinds [or types] of cement, which are to be carried, then will apply the requirements of APPENDIX "B". Fulfilling/Meeting the criteria [requirements] of APPENDIX "B" shall be proved by means of the Special Report signed by the Captain, which is mentioned in the said Appendix.

PART C - PROCEDURES FOR GRANTING CLEARANCE [PERMISSION] TO SAIL

1. The competent Port Authority shall not grant the clearance [permission] to sail to a ship which is loaded with cement cargo, if the documents listed below herein, have not been duly submitted to such Port Authority:

I) The Declarations [Statements] giving the data of the physical properties of the cement cargo(es), as described in Paragr. 1 of Part "B" of the present document.

II) A Declaration [Statement] in writing, by the Director of the terminal, in which must be specified by name, the [Authorized] Representative (i.e. the Agent) of the Loading Terminal.

III) The document mentioned in paragraph 2a of Part "B" of the present document, (which [the document] proves the compliance with the rules/regulations which concern the carriage of grain), or the document mentioned in paragraph 2b of Part "B" of the present document, (which proves the compliance with the criteria (with the requirements) of APPENDIX "A"). It is not required (ie. necessary) to submit these documents, if by the Declarations [Statements] of the physical properties of the cement cargoes, it is shown that the angle of repose is greater than 35° for all the kinds/types of cement which are to be carried.

IV) The Loading Plan, signed by the Captain (only if that was not submitted with the documents mentioned in subpar. III) above).

V) The Report by the Captain, according to APPENDIX "B" of the present document.

2. As an exception to the above [requirements], the competent Port Authority may allow/permit the sail of the ship, even if the documents of subpar. III) and/or V) above have not been submitted, provided that, all of the prerequisites given below herein are met (i.e. that they are fulfilled or covered).

- The Declarations [Statements] providing the data of the physical properties of the cement cargoes, show that the angle of repose is greater than 30° for all the kinds/types of cement which are to be carried.
- The wind force in the sea areas in which the ship is to sail for its planned voyage, does not exceed 7 (seven) of the "BEAUFORT"

scale, according to the Weather Forecast and the Sea Condition Report issued by the National Meteorological Service ("E.M.Y."), which applies at the time of departure [sailing off] of the ship.

- A Solemn Declaration, is signed and submitted by the Captain of the ship, in which he must solemnly declare that: (a) The ship shall not depart [sail off] before at least two (2) have elapsed from the time when the loading of the ship ended and (b) That he [the Captain] is obliged to proceed with, provided that such act shall not put the ship in danger, a deviation of the course of the ship to a safe anchorage or to another area, where there are better weather conditions, if during the sail he comes across sea conditions which are harder [sea rougher] than the one which corresponds to wind force greater than 7 of the "BEAUFORT" scale.

3. The documents mentioned in paragr. 1. and 2. of this Part, must be kept by the Port Authority until the end of the following [calendar] year from the date on which such documents were issued.

4. The following, are obliged to keep copies of the documents mentioned in par. 1. of this Part: (a) The Captain [Ship Master], in the records of the ship; and (b) The Company which is in charge of the management of the ship, in its records. The said copies of the documents, must be kept until the end of the following year from the date on which such documents were issued.

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APPENDIX "A"

Enhanced criteria of stability, for those ships which carry cement cargoes in bulk, in their holds or in the specially formed parts of their holds, for such cargoes with angle of repose greater than 30° and up to 35° .

1. The calculations which are required in order to check if the criteria given below herein are met [fulfilled], must be based on the stability manual, which has been prepared according to the Resol. No. A.749(18) of the IMO. The said criteria aim at ensuring sufficient limits of intact stability in the case which will arise for a ship of that kind [type], after an [undesirable] shifting of the cement cargo in the holds or in the specially formed parts of the holds of the ship. The criteria must be met [fulfilled] during the entire time of the sail of such ship:

(a) The angle of heel which arises (i.e. occurs) in calm water due to shifting of the cargo in all the holds (or the parts of the holds) which contain cement cargoes (with angles of repose greater than 30° and up to 35° inclusive) must not exceed 65% (sixty-five per cent) of the angle, at which the section of the freeboard deck with the side amidships, begins to submerge.

(b) In the diagram of statical stability $Gz(\theta)$, the remaining dynamic(al) stability, measured as the area of the surface which is defined by the lever arms of the angle of heel and by the curve of the righting lever arms (Gz) up to an angle of 30° or up to the flooding angle or up to the angle at which occurs the maximum difference of the ordinates of the two aforesaid curves (whichever of the three angles is the least) must not be less than 100 mmrad.

2. In order to check if the criteria of (a) and (b) above, are met (i.e. fulfilled), are taken the following assumptions:

(a) In the diagram of statical stability $Gz(\theta)$, the curve of the lever arms of the angle of heel, is taken as a straight line, with ordinates (in metres), arising from the following formulae:

For the abscissa of 0° :

$$R_{0^\circ} = \frac{1}{K_{0^\circ} \cdot \Delta} \cdot \sum_1^N \rho \cdot \int_0^L b^2 \cdot dL$$

For the abscissa of 30° :

$$R_{30^\circ} = K_{30^\circ} \cdot R_{0^\circ}$$

where:

R_θ the lever arm of the angle of heel for a given angle θ .

ρ the apparent specific gravity [specific weight] of the cargo in t/m^3 ,

Δ the displacement of the ship in t,

b the breadth of the hold (or part of the hold) in m, at the height of the level of the cargo in the hold (as it is shown based on the specific gravity [weight]).

L the length of the hold in m,

N the number of holds (or the parts of the holds).

K_{0° and K_{30° are the factors of the Table shown below:

angle φ°	K_{0°	K_{30°
5.00	131.4	0.8870
4.50	146.1	0.8823
4.00	164.5	0.8786
3.50	188.1	0.8745
3.00	219.5	0.8703
2.50	263.5	0.8661
2.00	329.5	0.8619
1.75	376.6	0.8600
1.50	439.4	0.8578
1.25	527.3	0.8557
1.00 up to 0.00	659.2	0.8536

Where ϕ is the difference of the angle of repose from the angle of 35° in degrees. If that is required, for any intermediate values of angle ϕ a linear interpolation shall apply [be used].

3. Where the form (or the shape) of the hold is such, that its breadth varies in relation to the height (i.e. level) of the cargo in the hold (at the area of the level of the cargo, as calculated based on the apparent specific gravity [specific weight]) and only for the calculation of the value corresponding to that particular hold (the following formula shall apply):

$$\int_0^L b^2 \cdot dL$$

(and not for the calculation of the location of the centre of gravity of the cargo) as a level of the cargo, shall be taken that intermediate level which is between the one which results based on the apparent specific gravity [weight] p and the one which results based on the apparent specific gravity [weight] $1.136p$, which is a level at which the above value is at its maximum [at its peak].

4. Longitudinal subdivisions of the hold which aim at limiting (or minimizing) the width of shifting of the cement cargo, so that finally [eventually] the lever arm of the heeling angle shall be limited, may be taken into consideration for the calculation, only if they meet [fulfill] the specifications given by Regulation 5, of Chapter VI of "SOLAS" and furthermore:

The [Each] longitudinal subdivision must extend for at least $b/8 + 0.12V / (b.L)$ or for 2.0 (two) metres (whichever is greater) below the surface of the cargo, and for at least $b/8$ or 2.0 (two)

metres (whichever is greater) above it or up to the deck and up to the hold hatch, where b is the average breadth of the divided hold at the surface [or the level] of the cargo, V is the volume of the cargo contained in the hold and L is the length of the hold.

5. The calculations mentioned above herein, shall be prepared [i.e. done] by a Naval Architect, in the form of a "Supplementary Stability Manual" corresponding to that provided for by Resolution No.: A.749(18) of the IMO, which shall be duly signed by the Naval Architect who prepared it (i.e. and who did the calculations) and it shall be submitted to the MERCHANT SHIPS INSPECTORATE OF THE MINISTRY OF MERCHANT MARINE ("YEN/ΔEET") or to the duly authorized Organization [Agency] in order to be certified. A certified copy of the said Manual shall [must] be kept in the records of the ship, in order to assist the Captain in the performance of his duties.

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APPENDIX "B"

Trimming of the cargo surface (or level)

1. In the assumptions of the "BC Code" ("Code of safe practice for solid Bulk Cargoes"), (BC Code IMO), INTERNATIONAL MARITIME DANGEROUS GOODS CODE, consolidated ed'n 1994, ISBN 92-801-1316-X), are included special measures for the limitation [minimization] of the probability of shifting of the cargo(es) with angles of repose greater than 30° and up to 35°, such as trimming of the surface of the cargo in the hold, in such a way that the vertical distance between the lowest point of the deepest "valley" and the highest point of the highest "mountain", to be less than 1.5 (one point five) metres and in any case less than 10% (ten per cent) of the breadth of the ship. The special "cement cargo carrying" ships are equipped [or fitted] with the appropriate systems, which have been designed for the purpose of achieving the trimming of the surface of the cargo in the best possible way [manner].

2. In order to check (i.e. to ensure) that, the aforementioned prerequisites, in every case of carriage of cement cargoes by ship and regardless of the value of the angle of repose which results by the Declarations [the Statements] which provide the data of the physical properties, the Captain shall take the proper care, after the end of loading of each hold or a part of a hold and before the ship sails off, after each partial unloading and also at sea, when there are the relevant indications or conditions (e.g. rough sea), that the measurements mentioned above are made and also that they are recorded/entered in a standardized for each ship report, which

will include drawings of the holds, of their breadth, the measurements which were made; and the relevant Declaration [Statement] of the Captain, by which it shall be certified that such measurements are accurate [correct], that they represent/show the condition of loading of the ship, that after the relevant checks which were performed, was found that the criteria [i.e. the requirements] of the "BC Code" are met [fulfilled] and that the ship shall not sail before at least two hours have elapsed after the end of loading.

The said Reports, shall be signed by the Officer of the ship who actually conducted [made] the measurements and by the Captain.

3. It is possible that for certain ships shall be required the construction, at certain locations of the deck, of special systems for the measurement of the true "ullage" (that is, of the vertical distance from the opening of the sounding hole to the surface of the cargo at a given location), always according to the Rules and Regulations of the International Convention on Load Lines of Ships.

For each hold (or for each part of a hold, which is separately loaded or separately unloaded) must exist (or must be constructed) the minimum number of measuring [gauge] posts (or positions) which are necessary for the check mentioned in the previous (i.e. in the last) paragraph.