

MSN 1671 (M)

Amendment 2

The Merchant Shipping (Cargo Ship Construction) (Amendment) Regulations 1999

Notice to Shipowners, Shipbuilders, Masters, Certifying Authorities and Surveyors

Summary

This notice amends the existing Merchant Shipping Notice 1671 (M)

Key points:

- Addition of a new schedule, concerned with openings in the shell plating below the freeboard deck of cargo ships, in order to reduce the risk of flooding via design changes for new vessels.
- To allow for access to the bow of a vessel in severe weather conditions, the construction of a suitable gangway and its retrospective fitting to existing vessels by July 2001, is detailed in a new schedule.
- Introduction of new tank coating standards for seawater ballast tanks for oil tankers and bulk carriers.

1) This Notice amends Merchant Shipping Notice MSN 1671 (M), which is an integral part of the Merchant Shipping (Cargo Ship Construction) Regulations 1997. By those Regulations that Notice may be amended by another document when the Secretary of State considers relevant. The amendments made by this Notice are in partial implementation of the amendments to SOLAS made by IMO Resolutions MSC 47(66) and MSC 57(67) which are also implemented by the Merchant Shipping (Cargo Ship Construction) (Amendment) Regulations 1999 (SI 1999 No.643).

2) The following are added to the table of contents;

Schedule 14: Openings in the shell plating below the freeboard deck of cargo ships

Schedule 15: Guidelines for safe access to tanker bows

Schedule 16: Guidelines on corrosion prevention of seawater ballast tanks

- 3) The following text should be inserted after the title heading to Schedule 2.

Ships constructed before 1 July 1998 shall comply with the requirements of paragraph 1(d) and 5(b) by the date of the first scheduled dry-docking after 1 July 1998 but not later than 1 July 2001

- 4) The following paragraph 1(d) shall be added to Schedule 2 in that Notice .

"1(d) include a secondary means of allowing full flow relief of vapour, air or inert gas mixtures to prevent over-pressure or under-pressure in the event of failure of the arrangements in 1(c). Alternatively, pressure sensors may be fitted in each tank protected by the arrangement required in 1(c) with a monitoring system in the ship's cargo control room or the position from which cargo operations are normally carried out. Such monitoring equipment shall also provide an alarm facility which is activated by detection of over-pressure or under-pressure conditions within a tank."

- 5) The following text shall be inserted into paragraph 5 of Schedule 2 before the last sentence. The paragraph shall be renumbered "5(a)";

"There shall be a clear visual indication of the operational status of the valves or other acceptable means. Where tanks have been isolated, it shall be insured that relevant isolating valves are opened before cargo loading or ballasting or discharging of those tanks is commenced."

- 6) The following text shall be added as paragraph 5(b)

"5(b) If cargo loading or ballasting or discharging of a cargo tank or cargo tank group is intended, which is isolated from a common venting system, that cargo tank or cargo tank group shall be fitted with a means for over-pressure or under-pressure protection as required in paragraph 1(d)."

- 7) In Schedule 3, paragraph 6(b)(ii), replace "10kPa" with 10 KPa per minute".
8) Add Schedules 14, 15 and 16.

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SCHEDULE 14

OPENINGS IN THE SHELL PLATING OF CARGO SHIPS BELOW THE FREEBOARD DECK

- 1 The number of openings in the shell plating shall be reduced to the minimum compatible with the design and proper working of the ship.
- 2 The arrangement and efficiency of the means for closing any opening in the shell plating shall be consistent with its intended purpose and the position in which it is fitted and generally to the satisfaction of the Administration.
- 3 Subject to the requirements of the International Convention on Load Lines in force, no sidescuttle shall be fitted in such a position that its sill is below a line drawn parallel to the freeboard deck at side and having its lowest point 2.5% of the breadth of the ship above the deepest subdivision load line, or 500 mm, whichever is the greater.
 - 3.1 All sidescuttles the sills of which are below the freeboard deck, as permitted by paragraph 3 shall be of such construction as will effectively prevent any person opening them without the consent of the master of the ship.
 - 3.1.1 Where in a between-decks, the sills of any of the sidescuttles referred to in paragraph 3.1 are below a line drawn parallel to the freeboard deck at side and having its lowest point 1.4 m plus 2.5% of the breadth of the ship above the water when the ship departs from any port, all the sidescuttles in that between-decks shall be closed watertight and locked before the ship leaves port, and they shall not be opened before the ship arrives at the next port. In the application of this paragraph the appropriate allowance for fresh water may be made when applicable.
 - 3.1.2 The time of opening such sidescuttles in port and of closing and locking them before the ship leaves port shall be entered in such log-book as may be prescribed by the Administration.
 - 3.1.3 For any ship that has one or more sidescuttles so placed that the requirements of paragraph 3.1.1 would apply when it was floating at its deepest subdivision load line, the Administration may indicate the limiting mean draught at which these sidescuttles will have their sills above the line drawn parallel to the freeboard deck at side, and having its lowest point 1.4 m plus 255 of the breadth of the ship above the waterline corresponding to the limiting mean draught, and at which it will therefore be permissible to depart from port without previously closing and locking them and to open them at sea on the responsibility of the master during the voyage to the next port. In tropical zones as defined in the International Convention on Load Lines in force, this limiting draught may be increased by 0.3 m.
- 4 Efficient hinged inside deadlights so arranged that they can be easily and effectively closed and secured watertight, shall be fitted to all sidescuttles except that abaft one eighth of the ship's length from the forward perpendicular and above a line drawn parallel to the freeboard deck at side and having its lowest point at a height of 3.7 m plus 2.5% of the breadth of the ship above the deepest subdivision load line, the deadlights may be portable in passenger accommodation other than that for steerage passengers, unless the deadlights are required by the International Convention on Load Lines in force to be permanently attached in their proper positions. Such portable deadlights shall be stowed adjacent to the sidescuttles they serve.
- 5 Sidescuttles and their deadlights which will not be accessible during navigation shall be closed and secured before the ship leaves port.
- 6 No sidescuttles shall be fitted in any spaces which are appropriated exclusively to the carriage of cargo or coal.

- 6.1 Sidescuttles may, however, be fitted in spaces appropriated to the carriage of cargo but they shall be of such construction as will effectively prevent any person opening them or their deadlights without the consent of the master.
- 6.2 If cargo is carried in such spaces, the sidescuttles and their deadlights shall be closed watertight and locked before the cargo is shipped and such closing and locking shall be recorded in such log-book as may be prescribed by the Administration.
- 7 Automatic ventilating sidescuttles shall not be fitted in the shell plating below the freeboard deck without the special sanction of the Administration.
- 8 The number of scuppers, sanitary discharges and other similar openings in the shell plating shall be reduced to the minimum either by making each discharge serve for as many as possible of the sanitary and other pipes, or in any other satisfactory manner.
- 9 All inlets and discharges in the shell plating shall be fitted with efficient and accessible arrangements for preventing the accidental admission of water into the ship.
- 9.1 Subject to the requirements of the International Convention on Load Lines in force, and except as provided in paragraph 9.3, each separate discharge led through the shell plating from spaces below the freeboard deck shall be provided with either one automatic non-return valve fitted with a positive means of closing it from above the freeboard deck or with two automatic non-return valves without positive means of closing, provided that the inboard valve is situated above the deepest subdivision load line and is always accessible for examination under service conditions. Where a valve with positive means of closing is fitted, the operating position above the freeboard deck shall always be readily accessible and means shall be provided for indicating whether the valve is open or closed.
- 9.1.1 The requirements of the International Convention on Load Lines in force shall apply to discharges led through the shell plating from spaces above the freeboard deck.
- 9.2 Machinery space main and auxiliary sea inlets and discharges in connection with the operation of machinery shall be fitted with readily accessible valves between the pipes and the shell plating or between the pipes and fabricated boxes attached to the shell plating. The valves may be controlled locally and shall be provided with indicators showing whether they are open or closed.
- 9.3 All shell fittings and valves required by this regulation shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable. All pipes to which this regulation refers shall be of steel or other equivalent material to the satisfaction of the Administration.
- 10 Gangway, cargo and coaling ports fitted below the freeboard deck shall be of sufficient strength. They shall be effectively closed and secured watertight before the ship leaves port, and shall be kept closed during navigation.
- 10.1 Such ports shall in no case be so fitted as to have their lowest point below the deepest subdivision load line.
- 11 The inboard opening of each ash-chute, rubbish-chute, etc, shall be fitted with an efficient cover.
- 11.1 If the inboard opening is situated below the freeboard deck, the cover shall be watertight, and in addition an automatic non-return valve shall be fitted in the chute in an easily accessible position above the deepest subdivision load line. When the chute is not in use both the cover and the valve shall be kept closed and secured.

SCHEDULE 15

GUIDELINES FOR SAFE ACCESS TO TANKER BOWS

1 GANGWAYS AND ACCESS

- 1.1** Tankers, including oil tankers, chemical tankers and gas carriers shall be provided with means to enable the crew to gain safe access to the bow even in severe weather conditions. For tankers constructed on or after 1 July 1998, the access should be by means of either a walkway on the deck or a permanently constructed gangway of substantial strength at or above the level of the superstructure deck or the first tier of a deckhouse which should:
- 1.2** be not less than 1 m in width, situated on or as near as practicable to the centre line of the ship and located so as not to hinder easy access across working areas of the deck;
 - 1.3** be fitted at each side throughout its length with a footstop and guard rails supported by stanchions. Such rails should consist of no less than 3 courses, the lowest being not more than 230 mm and the uppermost being at least 1 m above the gangway or walkway, and no intermediate opening should be more than 380 mm in height. Stanchions should be at intervals of not more than 1.5 m;
 - 1.4** be constructed of fire resistant and non-slip material;
 - 1.5** have openings, with ladders where appropriate, to and from the deck. Openings should not be more than 40 m apart;
 - 1.6** if the length of exposed deck to be traversed exceeds 70 m, have shelters of substantial construction set in way of the gangways or walkways at intervals not exceeding 45 m. Every such shelter should be capable of accommodating at least one person and be so constructed as to afford weather protection on the forward, port and starboard sides; and
 - 1.7** if obstructed by pipes or other fittings of a permanent nature, be provided with means of passage over such obstruction.
 - 1.8** The Administration may accept alternative or modified arrangements for tankers with space constraint, such as small tankers, or tankers with large freeboard, such as gas carriers, provided that such alternative or modified arrangements achieve an equivalent level of safety for access to the bow.
 - 1.9** Arrangements already approved by the Administration for the tankers constructed before 1 July 1998 may be accepted, provided that such existing arrangements achieve an equivalent level of safety for access to the bow.

SCHEDULE 16

GUIDELINES FOR THE SELECTION, APPLICATION AND MAINTENANCE OF CORROSION PREVENTION SYSTEMS OF DEDICATED SEAWATER BALLAST TANKS

1 GENERAL

- 1.1 The purpose of these guidelines is to recommend general criteria for the selection, application and maintenance of corrosion prevention systems of dedicated seawater ballast tanks. They apply to new oil tankers and bulk carriers.
- 1.2 The guidelines are not intended to replace the technical aspects of any specific coating system, to be covered by the product and job specifications, which are at the discretion and under the responsibility of shipowners, manufacturers and shipyards.
- 1.3 The owner should select and maintain a system which will ensure an adequate level of corrosion prevention of the seawater ballast tanks.
- 1.4 Coating manufacturers should give evidence of the quality of the product and its ability to satisfy the owner's requirements.
- 1.5 The shipyard and/or its subcontractors should provide clear evidence of their experience in coating application. The coating standard, job specification, inspection, maintenance and repair criteria should be agreed by the shipyard and/or its subcontractors, owner and manufacturer, in consultation with the Administration or an organization recognized by the Administration, before the ship's construction.

2 DEFINITIONS

- 2.1 *Anode* is an electrode through which direct current enters an electrolyte.
- 2.2 *Ballast tank* is a tank which is used for water ballast and includes segregated ballast tanks, ballast double bottom spaces and peak tanks.
- 2.3 *Cathodic protection* is a way of protecting a steel surface from corrosion by installing sacrificial anodes, in contact with the steel in the electrochemical seawater corrosion cell.

2.4 *Dewpoint* is the temperature at which air is saturated with moisture.

2.5 *DFT* is the nominal dry film thickness.

2.6 *Hard Coating* is a coating which chemically converts during its curing process, normally used for new constructions or non-convertible air drying coating which may be used for maintenance purposes. Hard coating can be either inorganic or organic.

2.7 *LEL* is the lower explosive limit.

2.8 *Light colour* is a colour of coating easily distinguishable from rust.

2.9 *Primer coat* is the first coating applied in the shipyard (to differentiate it from shop-primer).

2.10 *Shop-primer* means prefabrication thin primer coating applied to steel plates, often in automatic plants.

2.11 *Solvent* means a volatile liquid capable of completely dissolving a given binder.

2.12 *Thinner* means a volatile liquid that does not necessarily dissolve the binder, but which is capable of reducing the viscosity of the binder solution (vehicle), for example in reducing the viscosity of a paint to spraying consistency.

2.13 *TLV* means threshold limit value.

3 COATING

3.1 General

3.1.1 The lifetime of a coating applied to a new construction may be influenced by several aspects which include coating selection, application, and maintenance scheme.

3.1.2 Use of hard coating is the most common practice in present technology. The effectiveness of a hard coating can be achieved only if the manufacturer's technical product data sheet and job specifications are carefully followed.

3.1.3 Multi-coat treatments with coating layers of contrasting colours are recommended. The last layer of coat should preferably be of a light colour in order to facilitate in-service inspections.

3.1.4 Coating performance can be improved by adopting measures at the design stage such as reducing scallops, using rolled profiles, and ensuring that the structural configuration permits easy access with tools and facilitates cleaning, drainage and drying of tanks.

3.1.5 Where coating is supplemented by cathodic protection, the coating must be compatible with the cathodic protection system.

3.2 Coating selection

3.2.1 The selection of a coating should be considered by the parties involved with respect to the service conditions and planned maintenance.

3.2.2 The following aspects, *inter alia*, should be considered:

- .1 location of tank relative to heated surfaces;
- .2 frequency of ballasting/deballasting operations;
- .3 required surface condition;
- .4 required surface cleanliness and dryness; and
- .5 supplementary cathodic protection, if any.

3.2.3 Coating manufacturers should have products with documented satisfactory performance records and technical data sheets. The manufacturers should also be capable of rendering adequate technical assistance.

3.2.4 For products without satisfactory performance records, coating selection should be supported by appropriate data on tests carried out in accordance with recognized standards in order to verify their suitability to the service conditions (eg immersion, accelerated hot salt spray and adhesion tests).

3.2.5 Coatings for application underneath sun-heated decks or on bulkheads forming

boundaries of heated cargo spaces should be able to withstand constant or repeated heating without becoming brittle.

3.2.6 Due regard should be given to the possible poor edge covering properties of hard coatings with a high solid content.

3.3 Surface preparation

3.3.1 Surface preparation by appropriate methods should be in accordance with the coating manufacturer's specifications and recommendations. The actual sequence of surface preparation and coating application depends on the standard selected.

3.3.2 The steel surface should be prepared so that the coating selected can achieve an even distribution at the required dry film thickness and have an adequate adhesion by removing sharp edges, grinding weld beads, and removing weld spatter and by other surface contaminants.

3.3.3 Cleaning to near white metal or equivalent may be carried out either on incoming materials (plates and profiles), immediately before the ship-primer application, or after completion of tanks before the application of the primer coating.

3.3.4 If blast cleaning techniques are to be employed after completion of tanks, the conditions under which blast cleaning is carried out should preclude condensation. In this respect, it is not recommended to carry out blasting when:

- .1 the relative humidity is above 85%; or
- .2 the surface temperature of steel is less than 3°C above the dewpoint; or
- .3 there is any possibility that the surface of the steel is wet, or there are traces of moisture, or condensation occurs before the primer coat is applied.

3.3.5 Blasting abrasives and dust should be completely removed by means of vacuum cleaning, compressed air and brushes after blasting operations have finished. The abrasive used for blasting should be dry and free from dirt, oil, grease or chlorides, and suitable for producing the standard of cleanliness and profile specified by the manufacturer.

3.4 Checking of surface preparation

Checks of the steel surface cleanliness and roughness profile should be carried out at the end of the surface preparation and before the application of the primer coat, in accordance with the manufacturer's specifications.

3.5 Coating application

3.5.1 The application of a coating should be a well-planned activity, integrated in the shipyard's construction plans, and carried out under controlled conditions in order to avoid conflicts with other yard operations.

3.5.2 Coatings, including the primer and intermediate coats, should be applied on surfaces prepared and checked according to the provisions of 3.3 and 3.4.

3.5.3 Coatings should be applied by spraying under controlled humidity and surface temperature conditions, in accordance with manufacturer's recommendations. Additional stripe coats, if required by the job specifications, should be applied by brush or roller to welds, edges and areas not easily accessible.

3.5.4 Areas where the ship-primer is damaged in any way may be touched up in accordance with the manufacturer's specifications.

3.5.5 Each coating layer should have the maximum/minimum thicknesses in accordance with the coating specification. An 80/20 practice may be adopted, which means that 80% of all thickness measurements should be greater than or equal to the nominal DFT, and none of the remaining 20% is below 80% of the DFT.

3.5.6 Care should be taken to avoid increasing the thickness in an exaggerated way. Excessive thickness could lead to dangerous consequences, such as solvent and thinner retention, film cracks, gas pockets, etc. Wet coating thickness should be checked during application.

3.5.7 Each coating layer should be adequately cured before application of the next coat, in accordance with the manufacturer's recommendations. Intermediate coats must not be contaminated with dirt, grease, dust, salt, overspray, etc. Job specifications should include the dry-to-re-coat times given by the manufacturer.

3.6 Ventilation

Adequate ventilation is necessary for the proper curing of coating. Ventilation should be maintained throughout the application process and for a period after application is completed, as recommended by the coating manufacturer.

3.7 Testing of coating

3.7.1 Destructive tests should be avoided.

3.7.2 Dry film thickness tests should be carried out after each coat, not just at the end of the coating application, by using appropriate thickness gauges.

3.8 Inspection

3.8.1 Inspections relevant to surface preparation and coating application should be agreed upon between the shipowner and shipyard under the manufacturer's advice. Clear evidence of all the above-mentioned inspections should be reported in an agreed format. Such reports should be at the disposal of all the interested parties, including the Administration or an organization recognized by the Administration.

3.8.2 The activities that should be overseen, *inter alia*, are:

- .1 working conditions, eg illumination, access, staging, etc;
- .2 environmental conditions, eg temperature and moisture;
- .3 removing of sharp edges;
- .4 blast cleaning/mechanical cleaning;
- .5 cleaning up after blast cleaning;
- .6 Shielding of painted surfaces from blasting operations;
- .7 coating application equipment;
- .8 curing times for individual coats in relation to temperature and humidity;
- .9 thickness of each coat;
- .10 use and quantity of specified thinner;
- .11 continuity of coatings;
- .12 storing of coating materials and abrasives;
- .13 cleaning of coated surfaces before application of next coat;
- .14 handling/storing/transport of coated objects; and
- .15 coating repairs, when damaged.

3.8.3 Any defective areas, eg pinholes, bubbles, voids, etc, should be marked up and appropriate repairs effected. All such repairs should be rechecked for any uncoated areas.

3.9 Safety precautions

3.9.1 Most paints contain flammable solvents, and some contain materials which can harm the skin or damage the health if swallowed or inhaled. Precautions should be taken to reduce health risks and fire and explosion risks, in accordance with the appropriate safety regulations, to ensure that safe working conditions are achieved.

3.9.2 Health risks may include:

- .1 gases or vapours, ie solvent evaporation during the drying period, or formed during the heating of the painted object, which may exceed the permissible exposure limits;
- .2 liquids in the paint, ie solvents or binders, which may be toxic if swallowed or inhaled as spray droplets, or if in contact with the skin;
- .3 fumes, powders or dust formed during heating painted objects (eg flame-cutting or welding painted steel), or present in powder formed during sanding operation, or in the spray mist.

3.9.3 Precautions should be taken to reduce health risks, fire and explosion risks and other safety risks, in accordance with the regulations of the Administration.

4 CATHODIC PROTECTION

4.1 Cathodic protection by means of sacrificial anodes may be used in combination with the coating to prevent or reduce pitting corrosion starting from local defects in the coating.

4.2 The anodes should be designed in terms of size, weight and distribution to give an adequate life commensurate with the service period. The anode distribution, type, weight and dimensions should be shown in relevant documents and be available for maintenance purposes.

4.3 Once their number and size has been determined, the anodes should be distributed evenly over all the structure with some emphasis on horizontal surfaces likely to retain water. In particular, they should be installed close to the bottom plates of tanks which are seldom completely dry.

4.4 Cathodic protection is without effect when the tank is empty, and it requires some time (a day or more) to become effective after the tank has been filled.

4.5 The following aspects should be considered:

- .1 size and shape of tanks and areas to be protected;
- .2 extent and location of coated and uncoated surfaces;
- .3 frequency of ballasting/deballasting operations, including the percentage of time the tank is filled and level of filling; and
- .4 the resistivity of water, its temperature, etc.

4.6 The anode renewal should be carried out well before the old anodes are fully consumed. The renewal periods should be based on in-service experience.

5 ALTERNATIVE METHODS

Alternative corrosion prevention systems may be used, provided they give the same levels of corrosion prevention accomplished by means of hard coatings.

6 MAINTENANCE

6.1 Maintenance of the corrosion prevention system should be included in the overall ship's maintenance scheme. The effectiveness of the corrosion prevention system should be verified during the ship's life by the Administration or an organization recognized by the Administration, in accordance with the Guidelines on the Enhanced Programme of Inspections During Surveys of Bulk Carriers and Oil Tankers (resolution A.744(18)).

- 6.2 The most efficient way to preserve the corrosion prevention system is to repair any defects found during the in-service inspections (eg spot rusting, local breakdown at edges of stiffeners, etc.). Re-coating of all the defective surfaces should be carried out in accordance with the manufacturer's specifications.
- 6.3 A type of hard coating compatible with the one used for construction should be applied. This compatibility should be checked by the owner and the manufacturer involved in re-coating operations.
- 6.4 If the required conditions for the application of the original coating are not achievable, a coating more tolerant of a lower quality of surface treatment, humidity and temperature conditions may be considered, provided that it is applied and maintained in accordance with the manufacturer's specifications.
- 6.5 When coating is supplemented with cathodic protection, the maintenance scheme should include the replacement of the sacrificial anodes and the inspection of coating around the anode supports.