

INTERNATIONAL MARITIME ORGANIZATION

4 ALBERT EMBANKMENT,  
LONDON SE1 7SR

Telephone 01-735 7611  
Telegrams INTERMAR-LONDON SE1  
Telex 23588



IMO

MSC/Circ.401  
13 February 1985

*H. H. H.*  
*H. H. H.*  
Freibord-Akte  
MARPOL  
IACS - Akte  
zurück an Jb

Ref. T4/7.01

CODE FOR EXISTING SHIPS CARRYING LIQUEFIED GASES IN BULK

Fourth set of amendments

The Maritime Safety Committee, at its fiftieth session, adopted the fourth set of amendments to the Code for Existing Ships Carrying Liquefied Gases in Bulk, (MSC 50/27, annex 15) attached hereto.

The application date for the fourth set of amendments is 26 May 1985 and Member Governments are invited to implement the amendments from that date.

\*\*\*

ANNEX 15FOURTH SET OF AMENDMENTS TO THE CODE FOR EXISTING  
SHIPS CARRYING LIQUEFIED GASES IN BULK

The application date of the fourth set of amendments is 26 May 1985.

## CHAPTER I - GENERAL

Replace section 1.6 as follows:

## "1.6 Survey requirements

1.6.1 The structure, equipment, fittings, arrangements and material (other than items in respect of which a Cargo Ship Safety Construction Certificate, Cargo Ship Safety Equipment Certificate and Cargo Ship Safety Radiotelegraphy Certificate or Cargo Ship Safety Radiotelephony Certificate are issued) of a gas carrier should be subjected to the following surveys:

- (a) An initial survey before the ship is put in service or before the Certificate of Fitness for the Carriage of Liquefied Gases in Bulk is issued for the first time, which should include a complete examination of its structure, equipment, fittings, arrangements and material in so far as the ship is covered by the Code. This survey should be such as to ensure that the structure, equipment, fittings, arrangements and material fully comply with the applicable provisions of the Code.
- (b) A periodical survey at intervals specified by the Administration, but not exceeding five years which should be such as to ensure that the structure, equipment, fittings, arrangements and material comply with the applicable provisions of the Code.
- (c) A minimum of one intermediate survey during the period of validity of the Certificate of Fitness for the Carriage of Liquefied Gases in Bulk. In cases where only one such intermediate survey is carried out in any one certificate validity period, it should be held not before six months prior to, nor later than six months after, the half-way date of the certificate's period of validity. Intermediate surveys should be such as to ensure that the safety equipment, and other equipment, and associated pump and piping systems comply with the applicable provisions of the Code and are in good working order. Such surveys should be endorsed on the Certificate of Fitness for the Carriage of Liquefied Gases in Bulk.

- (d) An annual survey within three months before or after the anniversary date of the Certificate of Fitness for the Carriage of Liquefied Gases in Bulk which should include a general examination to ensure that the structure, equipment, fittings, arrangements and materials remain in all respects satisfactory for the service for which the ship is intended. Such a survey should be endorsed in the Certificate of Fitness for the Carriage of Liquefied Gases in Bulk.
- (e) An additional survey, either general or partial according to the circumstances, should be made when required after an investigation prescribed in 1.6.2(c), or whenever any important repairs or renewals are made. Such a survey should ensure that the necessary repairs or renewals have been effectively made, that the material and workmanship of such repairs or renewals are satisfactory; and that the ship is fit to proceed to sea without danger to the ship or persons on board.

#### 1.6.2 Maintenance of conditions after survey .

- (a) The condition of the ship and its equipment should be maintained to conform with the provisions of the Code to ensure that the ship will remain fit to proceed to sea without danger to the ship or persons on board.
- (b) After any survey of the ship under 1.6 has been completed, no change should be made in the structure, equipment, fittings, arrangements and material covered by the survey, without the sanction of the Administration, except by direct replacement.
- (c) Whenever an accident occurs to a ship or a defect is discovered, either of which affects the safety of the ship or the efficiency or completeness of its life-saving appliances or other equipment, the master or owner of the ship should report at the earliest opportunity to the Administration, the nominated surveyor or recognized organization responsible for issuing the relevant certificate, who should cause investigations to be initiated to determine whether a survey, as required by 1.6.1(e), is necessary.

#### 1.6.3 Issue of a Certificate of Fitness

- (a) A certificate called a Certificate of Fitness for the Carriage of Liquefied Gases in Bulk, the model form of which is set out at Appendix, should be issued after an initial or periodical survey to a gas carrier which complies with the relevant requirements of the Code.

- (b) The certificate issued under the provisions of this section should be available on board for inspection at all times.
- (c) When a ship is designed and constructed under the provisions of 1.2.4, Certificates of Fitness should be issued in accordance with the requirements of this section and with the requirements of section 1.6 of the Bulk Chemical Code.

#### 1.6.4 Issue or endorsement of certificate by another Government

A Government may, at the request of another Government, cause a ship entitled to fly the flag of the other Government to be surveyed and, if satisfied that the requirements of the Code are complied with, issue or authorize the issue of the certificate to the ship, and, where appropriate, endorse or authorize the endorsement of the certificate on the ship in accordance with the Code. Any certificate so issued should contain a statement to the effect that it has been issued at the request of the Government of the State the flag of which the ship is entitled to fly.

#### 1.6.5 Duration and validity of the certificate

- (a) A Certificate of Fitness for the Carriage of Liquefied Gases in Bulk should be issued for a period specified by the Administration which should not exceed five years from the date of the initial survey or the periodical survey.
- (b) No extension of the five year period of the certificate should be permitted.
- (c) The certificate should cease to be valid:
  - (i) if the surveys are not carried out within the period specified by 1.6;
  - (ii) upon transfer of the ship to the flag of another Government. A new certificate should only be issued when the Government issuing the new certificate is fully satisfied that the ship is in compliance with the requirements of 1.6.2(a) and 1.6.2(b). Where a transfer occurs to the flag of another Government, the Government of the State whose flag the ship was formerly entitled to fly may, if requested within twelve months after the transfer has taken place, as soon as possible transmit to the Administration copies of the certificates carried by the ship before the transfer and, if available, copies of the relevant survey reports."

CHAPTER XVII

17.9.3 - Add the following to this paragraph:

"To minimize the risk of stress corrosion cracking occurring when ammonia is carried at a temperature above  $-20^{\circ}\text{C}$  (vapour pressure  $1.9 \text{ kg/cm}^2$ ), the oxygen content of the vapour space in pressure vessels and in pipelines made of carbon-manganese steel (and other steels which require special consideration) should be reduced to the minimum practicable before liquid ammonia is introduced. The condensate system of tanks operating at  $-33^{\circ}\text{C}$  may be affected unless it has been thermally stress relieved".

Replace entire paragraph 17.9.6 as given in the second set of amendments by the following:

"17.9.6 Propylene oxide and mixtures of ethylene oxide/propylene oxide with ethylene oxide content not more than 30 per cent by weight

- (a) Products transported under the provisions of this section should be acetylene free.
- (b) For the purposes of this section the term "independent" means that a piping system or venting system, for example, is in no way connected to another system and that there are no means available for the potential connexion to other systems.
- (c) (i) Unless cargo tanks are properly cleaned, these products should not be carried in tanks which have contained as one of the three previous cargoes any product known to catalyse polymerization, such as:
- ammonia, anhydrous and ammonia solutions;
  - amines and amine solutions;
  - oxidizing substances (e.g. chlorine).
- (ii) Before loading tanks should be thoroughly and effectively cleaned to remove all traces of previous cargoes from tanks and associated pipework, except where the immediate prior cargo has been propylene oxide or ethylene oxide/propylene oxide mixtures. Particular care should be taken in the case of ammonia in tanks made of steel other than stainless steel.
- (iii) In all cases, the effectiveness of cleaning procedures for tanks and associated pipework should be checked by suitable testing or inspection to ascertain that no traces of acidic or alkaline materials remain that might create a hazardous situation in the presence of these products.

- (iv) Tanks should be entered and inspected prior to each initial loading of these products to ensure freedom from contamination, including heavy rust deposits and visual structural defects. When cargo tanks are in continuous service for these products, such inspections should be performed at intervals of not more than two years.
  - (v) Tanks for the carriage of these products should be of steel or stainless steel construction.
  - (vi) Tanks which have contained these products may be used for other cargoes after thorough cleaning of tanks and associated pipework systems by washing or purging.
- (d) (i) All valves, flanges, fittings and accessory equipment should be of a type suitable for use with these products and should be constructed of steel or stainless steel or other material acceptable to the Administration. The chemical composition of all material used should be submitted to the Administration for approval prior to fabrication. Discs or disc faces, seats and other wearing parts of valves should be made of stainless steel containing not less than 11 per cent chromium.
- (ii) Gaskets should be constructed of materials which do not react with, dissolve in, or lower the auto-ignition temperature of these products and which are fire resistant and possess adequate mechanical behaviour. The surface presented to the cargo should be polytetrafluoroethylene (PTFE) or materials giving a similar degree of safety by their inertness. Spirally-wound stainless steel with a filler of PTFE or similar fluorinated polymer may be accepted by the Administration.
- (iii) Insulation and packing if used should be of a material which does not react with, dissolve in, or lower the auto-ignition temperature of these products.
- (iv) The following materials are generally found unsatisfactory for gaskets, packing and similar uses in containment systems for these products and would require testing before being approved by the Administration:
- Neoprene or natural rubber if it contacts the products;
  - Asbestos or binders used with asbestos;
  - Materials containing oxides of magnesium, such as mineral wools.

- (e) Filling and discharge piping should extend to within 100 mm of the bottom of the tank or any sump pit.
- (f) (i) The products should be loaded and discharged in such a manner that venting of the tanks to atmosphere does not occur. If vapour return to shore is used during tank loading, the vapour return system connected to a containment system for the product should be independent from all other containment systems.
- (ii) During discharging operations, the pressure in the cargo tank should be maintained above  $0.07 \text{ kg/cm}^2$  gauge.
- (iii) The cargo may be discharged only by deepwell pumps, hydraulically operated submerged pumps, or inert gas displacement. Each cargo pump should be arranged to ensure that the product does not heat significantly if the discharge line from the pump is shut off or otherwise blocked.
- (g) Tanks carrying these products should be vented independently of tanks carrying other products. Facilities should be provided for sampling the tank contents without opening the tank to atmosphere.
- (h) Cargo hoses used for transfer of these products should be marked "FOR ALKYLENE OXIDE TRANSFER ONLY".
- (i) Hold spaces should be monitored for these products. Hold spaces surrounding independent tanks type A and B should also be inerted and monitored for oxygen. The oxygen content of these spaces should be maintained below 2 per cent. Portable sampling equipment is satisfactory.
- (j) Prior to disconnecting shore-lines, the pressure in liquid and vapour lines should be relieved through suitable valves installed at the loading header. Liquid and vapour from these lines should not be discharged to atmosphere.
- (k) Tanks should be designed for the maximum pressure expected to be encountered during loading, carriage or unloading of cargo.
- (l) Tanks for the carriage of propylene oxide with a design vapour pressure of less than  $0.6 \text{ kg/cm}^2$  gauge and tanks for the carriage of ethylene oxide/propylene oxide mixtures with a design vapour pressure of less than 1.2 bar gauge should have a cooling system to maintain the cargo below the reference temperature. For reference temperature see 15.1.4(a).

- (m) Pressure relief valve settings should not be less than  $0.2 \text{ kg/cm}^2$  gauge and for type C independent cargo tanks not greater than  $7.0 \text{ kg/cm}^2$  gauge for the carriage of propylene and oxide and not greater than  $5.3 \text{ kg/cm}^2$  gauge for the carriage of ethylene oxide/propylene oxide mixtures.
- (n) (i) The piping system for tanks to be loaded with these products should be completely separate from piping systems for all other tanks, including empty tanks, and from all cargo compressors. If the piping system for the tanks to be loaded with the product is not independent as defined in sub-paragraph (b) the required piping separation must be accomplished by the removal of spool pieces, valves, or other pipe sections and the installation of blank flanges at these locations. The required separation applies to all liquid and vapour piping, liquid and vapour vent lines and any other possible connexions such as common inert gas supply lines.
- (ii) The product may be transported only in accordance with cargo handling plans that have been approved by the Administration. Each intended loading arrangement should be shown on a separate cargo handling plan. Cargo handling plans should show the entire cargo piping system and the locations for installation of blank flanges needed to meet the above piping separation requirements. A copy of each approved cargo handling plan should be kept on board the ship. The Certificate of Fitness should be endorsed to include reference to the approved cargo handling plans.
- (iii) Before loading the product, certification verifying that the required piping separation has been achieved should be obtained from a responsible person acceptable to the Port Administration and carried on board the ship. Each connection between a blank flange and pipeline flange should be fitted with a wire and seal by the responsible person to ensure that inadvertent removal of the blank flange is impossible.
- (o) The maximum allowable tank filling limits for each cargo tank should be indicated for each loading temperature which may be applied and for the applicable maximum reference temperature, on a list to be approved by the Administration. A copy of the list should be permanently kept on board by the master.



(p) The cargo should be carried under a suitable protective padding of nitrogen gas. An automatic nitrogen make-up system should be installed to prevent the tank pressure falling below  $0.07 \text{ kg/cm}^2$  gauge in the event of product temperature fall due to ambient conditions or maloperation of refrigeration systems. Sufficient nitrogen should be available on board to satisfy the demand of the automatic pressure control. Nitrogen of commercially pure quality (99.9 per cent v/v) should be used for padding. A battery of nitrogen bottles connected to the cargo tanks through a pressure reduction valve satisfies the intention of the expression "automatic" in this context.

(q) The cargo tank vapour space should be tested prior to and after loading to ensure that the oxygen content is 2 per cent (v/v) or less.

(r) A water spray system of sufficient capacity should be provided to blanket effectively the area surrounding the loading manifold, the exposed deck piping associated with product handling and the tank domes. The arrangement of piping and nozzles should be such as to give a uniform distribution rate of  $10 \text{ l/m}^2 \text{ min}$ . The water spray system should be capable of both local and remote manual operation and the arrangement should ensure that any spilled cargo is washed away. Additionally, a water hose with pressure to the nozzle, when atmospheric temperatures permit, should be connected ready for immediate use during loading and unloading operations."

Insert new 17.16 as follows:

"17.16 Submerged electric cargo pumps

The vapour space of cargo tanks equipped with submerged electric motor pumps should be inerted to a positive pressure prior to loading, during carriage and during unloading of flammable liquids."

CHAPTER XIX

Amend column (f) for the following products:

|                     |     |                |
|---------------------|-----|----------------|
| Isoprene            | - ) |                |
| Isopropylamine      | - ) | add 17.16      |
| Monoethylamine      | - ) |                |
| Vinylidene Chloride | -   | insert 17.6(a) |

Add to Chapter XIX - Summary of Minimum Requirements - the following:

| (a)<br>Product name  | (b)  | (c)   | (d)   | (e) | (f)  |
|--|------|-------|-------|-----|--|
| Ethylene oxide/<br>Propylene oxide<br>mixtures<br>(max. 30% w/w<br>Ethylene oxide) | 2983 | Inert | I + T | C   | 17.2.2, 17.4.1, 17.5,<br>17.6(a), 17.9.6, 17.10,<br>17.11, 17.12, 17.13,<br>17.14, 17.15 |

APPENDIX - Model Form of Certificate of Fitness for the Carriage of Liquefied Gases in Bulk.

1 Replace the section "Surveys" with the following:

"ENDORSEMENT FOR ANNUAL AND INTERMEDIATE SURVEYS

THIS IS TO CERTIFY that at an annual survey required by 1.6.1(d) of the Code, the ship was found to comply with the relevant provisions of the Gas Carrier Code.

Annual Survey  
Signed: .....  
(Signature of authorized official)  
Place: .....  
Date: .....  
(Seal or stamp of the Authority, as appropriate)

Annual/Intermediate\* Survey  
Signed: .....  
(Signature of authorized official)  
Place: .....  
Date: .....  
(Seal or stamp of the Authority, as appropriate)

Annual/Intermediate\* Survey  
Signed: .....  
(Signature of authorized official)  
Place: .....  
Date: .....  
(Seal or stamp of the Authority, as appropriate)

Annual Survey  
Signed: .....  
(Signature of authorized official)  
Place: .....  
Date: .....  
(Seal or stamp of the Authority, as appropriate)

NOTE: An intermediate survey may take the place of an annual survey where the relevant provisions of 1.6.1(c) and 1.6.1(d) are complied with.

\* Delete as appropriate'

2 Delete the section on "Extension of Certificate".

ATTACHMENT - Model Form of Certificate of Fitness for the Carriage of Liquefied Gases in Bulk (Resolution A.328(IX)) modified to include endorsements related to Resolution A.329(IX)

Replace the section "Surveys" except the last two lines with the following:

"ENDORSEMENT FOR ANNUAL AND INTERMEDIATE SURVEYS

THIS IS TO CERTIFY that at an annual survey required by 1.6.1(d) of the Code, the ship was found to comply with the relevant provisions of the Gas Carrier Code.

Annual Survey  
Signed: .....  
(Signature of authorized official)  
Place: .....  
Date: .....

(Seal or stamp of the Authority, as appropriate)

Annual/Intermediate\* Survey  
Signed: .....  
(Signature of authorized official)  
Place: .....  
Date: .....

(Seal or stamp of the Authority, as appropriate)

Annual/Intermediate\* Survey  
Signed: .....  
(Signature of authorized official)  
Place: .....  
Date: .....

(Seal or stamp of the Authority, as appropriate)

Annual Survey  
Signed: .....  
(Signature of authorized official)  
Place: .....  
Date: .....

(Seal or stamp of the Authority, as appropriate)

NOTE: An intermediate survey may take the place of an annual survey where the relevant provisions of 1.6.1(c) and 1.6.1(d) are complied with.

\* Delete as appropriate"