
STATUTORY INSTRUMENTS

1993 No. 3163

MERCHANT SHIPPING

SAFETY

**The Merchant Shipping (Fire Protection)
(Amendment) Regulations 1993**

<i>Made</i>	- - - -	<i>14th December 1993</i>
<i>Laid before Parliament</i>		<i>7th January 1994</i>
<i>Coming into force</i>	- -	<i>31st January 1994</i>

The Secretary of State for Transport, after consulting the persons referred to in section 22(2) of the Merchant Shipping Act 1979⁽¹⁾, in exercise of the powers conferred on him by sections 21(1)(a) and (b) and (3) to (6) and 22(1) of that Act⁽²⁾ and of all other powers enabling him in that behalf, hereby makes the following Regulations:—

Citation, commencement and interpretation

1.—(1) These Regulations may be cited as the Merchant Shipping (Fire Protection) (Amendment) Regulations 1993 and shall come into force on 31st January 1994.

(2) In these Regulations—

“the 1984 Regulations” means the Merchant Shipping (Fire Protection) Regulations 1984⁽³⁾;

“the 1992 Regulations” means the Merchant Shipping (Fire Protection) (Amendment) Regulations 1992⁽⁴⁾.

Amendments of Fire Protection Regulations

2.—(1) The 1984 Regulations shall have effect subject to the amendments specified in the Schedule to these Regulations.

(2) In the 1992 Regulations (which amend the 1984 Regulations), for paragraph (2) of regulation 1 there shall be substituted the following paragraph—

(1) 1979 c. 39.

(2) Subsection (6) was amended by the Criminal Justice Act 1986 (c. 48), section 49(3).

(3) S.I.1984/1218, amended by S.I. 1985/1193, 1986/1070, and 1992/2360; and applied by S.I. 1986/1248.

(4) S.I. 1992/2360.

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- (a) “(2) Except for the provisions of these Regulations specified in sub-paragraph (b) below, these Regulations do not apply to ships which are not United Kingdom ships.
- (b) The following provisions of these Regulations apply to ships which are not United Kingdom ships as well as to United Kingdom ships—
 - (i) sub-paragraph (a) of paragraph (1) of regulation 2; and
 - (ii) so far as providing for the insertion of a definition of “Similar stage of construction”, sub-paragraph (b) of the said paragraph (1).”.

Signed by authority of the Secretary of State for Transport

14th December 1993

Caithness
Minister of State,
Department of Transport

SCHEDULE

Regulation 2(1)

AMENDMENTS OF MERCHANT SHIPPING (FIRE PROTECTION) REGULATIONS 1984

Regulation 1

1.—(1) In paragraph (2) of regulation 1—

(a) the definitions of—

(i) “Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk”; and

(ii) “Certificate of Fitness for the Carriage of Liquefied Gases in Bulk”;

shall be omitted.

(b) after the definition of “Reid vapour pressure” there shall be inserted the following definition—

““relevant standard of a member State other than the United Kingdom”, in relation to a reference to an International Standard or a British Standard, means—

(a) a relevant standard or code of practice of a national standards body or equivalent body of a member State other than the United Kingdom; or

(b) a relevant international standard recognised for use in a member State other than the United Kingdom; or

(c) a relevant specification acknowledged for use as a standard by a public authority of a member State other than the United Kingdom;

being a standard, code of practice or specification which provides, in use, levels of safety, suitability and fitness for purpose equivalent to those provided by the International Standard of the British Standard;”.

(2) In paragraph (3) of regulation 1, for the words from “shall include a reference” to the end there shall be substituted the following words—

“shall include—

(A) a reference to any document amending that publication which is considered by the Secretary of State to be relevant from time to time and is specified in a Merchant Shipping Notice; and

(B) as respects a reference to a British Standard, a reference to a relevant standard of a member State other than the United Kingdom.”.

(3) After paragraph (3) of regulation 1 there shall be inserted the following paragraph—

“(3A) In these Regulations—

(a) a reference to a ship constructed on or after a specified date is a reference to a ship the keel of which is laid or which is at a similar stage of construction on or after that date; and

(b) where the reference to a ship so constructed is to be understood as being or including a reference to a passenger ship, the reference includes a reference to a ship which satisfies both the following requirements, that is to say—

(i) that the keel of the ship was laid or that the ship was at a similar stage of construction before the specified date; and

(ii) that the ship, not being a passenger ship before that date, is converted to a passenger ship, such conversion commencing on or after that date.”.

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Regulation 9A

2. After regulation 9 there shall be inserted the following regulation—

“Paint lockers etc

9A. In every ship of Class I, every paint locker and flammable liquid locker shall be protected by an approved fire-extinguishing system.”.

Regulation 10

3. After paragraph (7) of regulation 10 there shall be inserted the following paragraph—

“(8) In every ship of Class I constructed on or after 1st January 1994, where a public space spans three or more decks by means of permanent openings and contains combustibles (such as furniture) and enclosed spaces (such as shops, offices and restaurants), the entire main vertical zone containing that space shall be protected throughout with a smoke detection system complying with the requirements (other than of paragraph (1)(i) of Schedule 11 to these Regulations.”.

Regulation 29

4. For sub-paragraph (b) of paragraph (3) of regulation 29 there shall be substituted the following sub-paragraph—

“(b) In every ship of Class VII of 2,000 tons or over the emergency fire pump shall—
(i) be capable of delivering at least one jet of water simultaneously from each of any two hydrants and hoses through nozzles which shall comply with regulation 62(4)(b) of these Regulations; and
(ii) meet the requirements of regulation 60(10) of these Regulations.”.

Regulation 35A

5. After regulation 35 there shall be inserted the following regulation—

“Paint lockers etc

35A. In every ship of Class VII of 500 tons or over, every paint locker and flammable liquid locker shall be protected by an approved fire-extinguishing system.”.

Regulation 49

6.—(1) In paragraph (1) of regulation 49, for the words from “having a valid” where those words first appear to the end there shall be substituted the words “or gas carriers. For these vessels alternative arrangements shall be provided to the satisfaction of the Secretary of State.”.

(2) At the beginning of paragraph (2) of regulation 49, for “Every” there shall be substituted “Subject to paragraph (2A) below, every”.

(3) In the said paragraph (2) the words from “except that in the case of” to the end shall be omitted.

(4) After the said paragraph (2) there shall be inserted the following paragraph—

“(2A) A tanker referred to in paragraph (2) above need not be provided with an inert gas system complying with the requirements of Schedule 14 to these Regulations if—

- (a) being a chemical tanker carrying as cargo any substance mentioned in the said paragraph (2), it is provided with an inert gas system complying with the requirements of Schedule 15 to these Regulations;
- (b) being a chemical tanker constructed before 1st July 1986 and carrying crude oil or petroleum products, it is provided with an inert gas system complying with the requirements of Schedule 16 to these Regulations;
- (c) being a gas carrier carrying as cargo a substance mentioned in the said paragraph (2), it is provided with cargo tank inerting arrangements equivalent to those specified in sub-paragraph (a) or (b) above;
- (d) being a chemical tanker or gas carrier constructed before 1st July 1986, it is carrying a flammable cargo other than crude oil or petroleum products;
- (e) being a chemical tanker or gas carrier constructed on or after 1st July 1986 and carrying a flammable cargo other than crude oil or petroleum products, it complies with the following requirements, that is to say—
 - (i) that the capacity of each tank used for the carriage of that cargo does not exceed 3,000 cubic metres;
 - (ii) that the capacity of each nozzle of a tank washing machine does not exceed 17.5 cubic metres per hour; and
 - (iii) that the total combined throughput from all such machines in use in a cargo tank at any time does not exceed 110 cubic metres per hour.

In sub-paragraphs (d) and (e) above, the references to a flammable cargo other than crude oil or petroleum products includes (without prejudice to the generality of those references) references to any of the cargoes listed in Chapters VI and VII of the Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk or Chapters 17 and 18 of the International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk.”.

Regulation 50

7. For paragraphs (2) and (3) of regulation 50 there shall be substituted the following paragraphs—

“(2) When the ship is provided with an inert gas system the cargo tanks shall first be purged—

- (a) in accordance with the provisions of paragraph (13) of Schedule 14 to these Regulations; or
- (b) if the ship does not need to be provided with an inert gas system complying with the requirements of that Schedule but is a ship mentioned in sub-paragraph (a), (b) or (c) of paragraph (2A) of regulation 49 of these Regulations, in accordance with the provisions of paragraph (12) of Schedule 15 or, as the case may be, paragraph (12) of Schedule 16 to these Regulations;

until the concentration of hydrocarbon vapours in the cargo tanks has been reduced to less than 2 per cent by volume. Thereafter, gas-freeing may take place at the cargo tank deck level.

(3) When the ship is not provided with an inert gas system, the operation shall be such that the flammable vapour is discharged—

- (a) through the vent outlets as specified in regulation 12 of the Merchant Shipping (Cargo Ship Construction and Survey) Regulations 1984⁽⁵⁾; or

(5) S.I. 1984/1217; relevant applying or amending instruments are S.I. 1985/661, 1986/1067.

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- (b) if the ship is one constructed on or after 1st February 1992, through outlets at least 2 metres above the cargo tank deck level with a vertical efflux velocity of at least 30 metres per second during the gas-freeing operation; or
- (c) through outlets at least 2 metres above the cargo tank deck level with a vertical efflux velocity of at least 20 metres per second and through devices (other than flame screens) complying with Schedule 1 to the Merchant Shipping (Cargo Ship Construction and Survey) Regulations 1984 so as to prevent the passage of flame into the cargo tanks;

until the flammable vapour concentration in the outlet has been reduced to 30 per cent of the lower flammable limit. Thereafter, gas-freeing may be continued at the cargo tank deck level.”.

Regulation 51

8. There shall be omitted from paragraph (2) of regulation 51 the words “having a valid Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk”.

Regulation 60

9.—(1) In sub-paragraph (a) of paragraph (10) of regulation 60, the words from “whilst” to the end shall be omitted.

(2) After the said sub-paragraph (a) there shall be inserted the following sub-paragraph—

“(aa) When the emergency fire pump is delivering the quantity of water required by sub-paragraph (a) of this paragraph, the pressure at any hydrant shall not be less than the pressure specified in paragraph (i) or (ii), as the case may be, of regulation 61(2)(b) of these Regulations.”.

(3) In sub-paragraph (d) of the said paragraph (10)—

(a) for the word “The” at the beginning there shall be substituted the words “If the ship was constructed before 1st February 1992, the”; and

(b) at the end there shall be added the following sentence—

“If the ship is one constructed on or after 1st February 1992, the total suction head and the net positive suction head of the emergency fire pump shall be such that the requirements of regulation 29(3)(a) and (b) of these Regulations and of sub-paragraph (a) of this paragraph shall be obtained under all conditions of list, trim, roll and pitch likely to be encountered in service.”.

Regulation 62

10. In regulation 62(1), for the sentence beginning “Such hoses” there shall be substituted the following sentence—

“In the case of—

(a) a ship constructed before 1st February 1992—

(i) every such hose forming part of the ship’s equipment before that date shall be made of closely woven flax, canvas or other suitable material; and

(ii) every other such hose shall be made of non-perishable material;

(b) a ship constructed on or after 1st February 1992, every such hose shall be made of non-perishable material;

and every such hose shall be provided with couplings, branch pipes, other necessary fittings and nozzles, as required by these Regulations.”.

Regulation 72A

11. After regulation 72 there shall be inserted the following regulation—

“Helicopter deck operations manual

72A. If a ship mentioned in regulation 72 (1) or (2) of these Regulations—

- (a) is a ship constructed on or after 1st February 1992; and
- (b) has a helicopter deck;

the ship shall carry an operations manual, which shall include a description and a checklist of safety precautions, procedures, and equipment requirements.”.

Regulation 75A

12. After regulation 75 there shall be inserted the following regulation—

“Helicopter decks

75A.—(1) This regulation applies to a ship constructed on or after 1st February 1992 and having a helicopter deck.

(2) Subject to paragraph (4) below, the helicopter deck shall be of steel or steel equivalent fire-resistant construction.

(3) If the space below the helicopter deck is of a high fire risk, the insulation standard shall be to the satisfaction of the Secretary of State.

(4) If the Secretary of State so permits, the helicopter deck may be constructed of aluminium or other low melting metal construction that is not made equivalent to steel, except that—

- (a) if the platform is cantilevered over the side of the ship, then, after the occurrence of a fire on the ship or on the platform, the platform shall undergo a structural analysis to determine its suitability for further use;
- (b) if the platform is located above the ship’s deckhouse or similar structure—
 - (i) the deckhouse top and bulkheads under the platform shall have no openings;
 - (ii) all windows under the platform shall be provided with steel shutters;
 - (iii) after a fire on or in close proximity to the platform, the platform shall undergo a structural analysis to determine its suitability for further use.”.

Regulation 78

13. In Category (7) of the categories of spaces shown in regulation 78(3)(b), before the words “lockers and store rooms” there shall be inserted the word “isolated”.

Regulation 82

14. After paragraph (11) of regulation 82 there shall be added the following paragraph—

“(12) In a ship constructed on or after 1st January 1994, where a public space spans three or more decks by means of permanent openings and contains combustibles (such as

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furniture) and enclosed spaces (such as shops, offices and restaurants), the space shall be equipped with a smoke extraction system; and—

- (a) the smoke extraction system shall—
 - (i) be activated by operation of the smoke detection system required by regulation 10(8) of these Regulations; and
 - (ii) be capable of being manually controlled; and
- (b) the size of the fan or fans shall be such that the entire volume within the space can be exhausted in not more than 10 minutes.”.

Regulation 84

15. In regulation 84(2)(b), for the words “or with any International or British Standard replacing the same” to the end there shall be substituted the words—

“or with—

- (i) any International Standard replacing the same or any British Standard which (in either case) the Secretary of State considers relevant from time to time and specifies in a Merchant Shipping Notice; or
- (ii) with any relevant standard of a member State other than the United Kingdom;”.

Regulation 86

16.—(1) In paragraph (2) of regulation 86, after the words “the requirements of” there shall be inserted the words “paragraph (1) of”.

(2) After paragraph (2) of regulation 86 there shall be inserted the following paragraph—

“(3) In a ship constructed on or after 1st January 1994, where a public space spans three or more decks by means of permanent openings and contains combustibles (such as furniture) and enclosed spaces (such as shops, offices and restaurants), the entire main vertical zone containing the space shall be protected throughout with an automatic sprinkler, fire detection and fire alarm system complying with the requirements specified in Schedule 7 to these Regulations.”.

Regulation 91A

17. After regulation 91 there shall be inserted the following regulation—

“Helicopter decks

91A.—(1) This regulation applies to a ship constructed on or after 1st February 1992 and having a helicopter deck.

(2) Subject to paragraph (4) below, the helicopter deck shall be of steel or steel equivalent fire-resistant construction.

(3) If the space below the helicopter deck is of a high fire risk, the insulation standard shall be to the satisfaction of the Secretary of State.

(4) If the Secretary of State so permits, the helicopter deck may be constructed of aluminium or other low melting metal construction that is not made equivalent to steel, except that—

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- (a) if the platform is cantilevered over the side of the ship, then, after the occurrence of a fire on the ship or on the platform, the platform shall undergo a structural analysis to determine its suitability for further use;
- (b) if the platform is located above the ship's deckhouse or similar structure—
 - (i) the deckhouse top and bulkheads under the platform shall have no openings;
 - (ii) all windows under the platform shall be provided with steel shutters;
 - (iii) after a fire on or in close proximity to the platform, the platform shall undergo a structural analysis to determine its suitability for further use.”.

Regulation 94

18. In the categories of spaces shown in regulation 94(3)(b)—

(a) for Category (5A) there shall be substituted the following Category—

“(5A) *service spaces of low risk*—

- (i) in a ship constructed before 1st February 1992, lockers and storerooms having areas of less than 2 square metres, drying rooms and laundries;
- (ii) in a ship constructed on or after 1st February 1992, lockers and storerooms not having provision for the storage of flammable liquids and having areas of less than 4 square metres, and drying rooms and laundries:”;

(b) for Category (9A) there shall be substituted the following Category—

“(9A) *service spaces of high risk*—

- (i) in a ship constructed before 1st February 1992, galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and storerooms having areas of 2 square metres or more, and workshops other than those forming part of the machinery spaces;
- (ii) in a ship constructed on or after 1st February 1992, galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and storerooms having areas of 4 square metres or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces:”.

Regulation 102

19.—(1) In paragraph (2) of regulation 102, after the words “the requirements of” there shall be inserted the words “paragraph (1) of”.

(2) After paragraph (2) of regulation 102 there shall be inserted the following paragraph—

“(3) In a ship constructed on or after 1st January 1994, where a public space spans three or more decks by means of permanent openings and contains combustibles (such as furniture) and enclosed spaces (such as shops, offices and restaurants), the entire main vertical zone containing the space shall be protected throughout with an automatic sprinkler, fire detection and fire alarm system complying with the requirements specified in Schedule 7 to these Regulations.”.

Regulation 110

20. After paragraph (2) of regulation 110 there shall be inserted the following paragraph—

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“(2A) Where a ship of Class I, II or IIA constructed on or after 1st January 1994 has a public space spanning three or more decks by means of permanent openings and containing combustibles (such as furniture) and enclosed spaces (such as shops, offices and restaurants)

- (a) each level within the space shall have two means of escape; and
- (b) one of those means of escape shall give direct access to an enclosed vertical means of escape meeting the requirements of paragraph (2)(c) of this regulation for a readily accessible enclosed stairway.”.

Regulation 112A

21. After regulation 112 there shall be inserted the following regulation—

“Helicopter decks

112A.—(1) This regulation applies to a ship constructed on or after 1st February 1992 and having a helicopter deck.

(2) Subject to paragraph (4) below, the helicopter deck shall be of steel or steel equivalent fire-resistant construction.

(3) If the space below the helicopter deck is of a high fire risk, the insulation standard shall be to the satisfaction of the Secretary of State.

(4) If the Secretary of State so permits, the helicopter deck may be constructed of aluminium or other low melting metal construction that is not made equivalent to steel, except that—

- (a) if the platform is cantilevered over the side of the ship, then, after the occurrence of a fire on the ship or on the platform, the platform shall undergo a structural analysis to determine its suitability for further use;
- (b) if the platform is located above the ship’s deckhouse or similar structure—
 - (i) the deckhouse top and bulkheads under the platform shall have no openings;
 - (ii) all windows under the platform shall be provided with steel shutters;
 - (iii) after a fire on or in close proximity to the platform, the platform shall undergo a structural analysis to determine its suitability for further use.”.

Regulation 115

22. In the categories of spaces shown in regulation 115(2)(b)—

(a) for category (5) there shall be substituted the following category—

“(5) *service spaces of low risk* are:

- (i) in a ship constructed before 1st February 1992, lockers and storerooms having areas of less than 2 square metres, drying rooms and laundries;
- (ii) in a ship constructed on or after 1st February 1992, lockers and storerooms not having provision for the storage of flammable liquids and having areas of less than 4 square metres, and drying rooms and laundries.”;

(b) for category (9) there shall be substituted the following category—

“(9) *service spaces of high risk* are:

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- (i) in a ship constructed before 1st February 1992, galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and storerooms having areas of 2 square metres or more, and workshops other than those forming part of the machinery spaces;
- (ii) in a ship constructed on or after 1st February 1992, galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and storerooms having areas of 4 square metres or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces.”.

Regulation 121

23. In paragraph (4) of regulation 121, for sub-paragraph (b) there shall be substituted the following sub-paragraphs—

- “(b) In a ship constructed before 1st February 1992, a non-combustible bulkhead, lining or ceiling fitted in an accommodation or service space may have a combustible veneer which—
 - (i) in corridors, stairway enclosures and control stations, does not exceed 1.5 millimetres in thickness;
 - (ii) in any other accommodation or service space, does not exceed 2.0 millimetres in thickness.
- (c) In a ship constructed on or after 1st February 1992—
 - (i) the total volume of combustible facings, mouldings, decorations and veneers in any accommodation or service space bounded by non-combustible bulkheads, ceilings and linings shall not exceed a volume equivalent to a 2.5 millimetre veneer on the combined area of the walls and ceilings;
 - (ii) a non-combustible bulkhead, lining or ceiling fitted in an accommodation or service space may have a combustible veneer with a gross calorific potential not exceeding 45 megajoules per square metre of surface area for the thickness used (as measured in accordance with the method specified in International Standard ISO 1716—1973(E) or with—
 - (A) any International Standard replacing the same or any British Standard which (in either case) the Secretary of State considers relevant from time to time and specifies in a Merchant Shipping Notice; or
 - (B) with any relevant standard of a member State other than the United Kingdom).”.

Regulation 128A

24. After regulation 128 there shall be inserted the following regulation—

“Helicopter decks

128A.—(1) This regulation applies to a ship constructed on or after 1st February 1992 and having a helicopter deck.

(2) Subject to paragraph (4) below, the helicopter deck shall be of steel or steel equivalent fire-resistant construction.

(3) If the space below the helicopter deck is of a high fire risk, the insulation standard shall be to the satisfaction of the Secretary of State.

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(4) If the Secretary of State so permits, the helicopter deck may be constructed of aluminium or other low melting construction that is not made equivalent to steel, except that—

- (a) if the platform is cantilevered over the side of the ship, then, after the occurrence of a fire on the ship or on the platform, the platform shall undergo a structural analysis to determine its suitability for further use;
- (b) if the platform is located above the ship's deckhouse or similar structure—
 - (i) the deckhouse top and bulkheads under the platform shall have no openings;
 - (ii) all windows under the platform shall be provided with steel shutters;
 - (iii) after a fire on or in close proximity to the platform, the platform shall undergo a structural analysis to determine its suitability for further use.”.

Regulation 132

25. In the categories of spaces shown in regulation 132(2)(b)—

(a) for category (5) there shall be substituted the following category—

“(5) *service spaces of low risk* are:

- (i) in a ship constructed before 1st February 1992, lockers and storerooms having areas of less than 2 square metres, drying rooms and laundries;
- (ii) in a ship constructed on or after 1st February 1992, lockers and storerooms not having provision for the storage of flammable liquids and having areas of less than 4 square metres, and drying rooms and laundries.”;

(b) for category (9) there shall be substituted the following category—

“(9) *service spaces of high risk* are:

- (i) in a ship constructed before 1st February 1992, galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and storerooms having areas of 2 square metres or more, and workshops other than those forming part of the machinery spaces;
- (ii) in a ship constructed on or after 1st February 1992, galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and storerooms having areas of 4 square metres or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces.”.

Regulation 138

26. In paragraph (4) of regulation 138 of the 1984 Regulations, for sub-paragraph (b) there shall be substituted the following sub-paragraphs—

“(b) In a ship constructed before 1st February 1992, a non-combustible bulkhead, lining or ceiling fitted in an accommodation or service space may have a combustible veneer which—

- (i) in corridors, stairway enclosures and control stations, does not exceed 1.5 millimetres in thickness;
- (ii) in any other accommodation or service space, does not exceed 2.0 millimetres in thickness.

(c) In a ship constructed on or after 1st February 1992—

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- (i) the total volume of combustible facings, mouldings, decorations and veneers in any accommodation or service space bounded by non-combustible bulkheads, ceilings and linings shall not exceed a volume equivalent to a 2.5 millimetre veneer on the combined area of the walls and ceilings;
- (ii) a non-combustible bulkhead, lining or ceiling fitted in an accommodation or service space may have a combustible veneer with a gross calorific potential not exceeding 45 megajoules per square metre of surface area for the thickness used (as measured in accordance with the method specified in International Standard ISO 1716—1973(E) or with—
 - (A) any International Standard replacing the same or any British Standard which (in either case) the Secretary of State considers relevant from time to time and specifies in a Merchant Shipping Notice; or
 - (B) with any relevant standard of a member State other than the United Kingdom).’.

Regulation 143

27.—(1) For paragraph (1) of regulation 143 there shall be substituted the following paragraphs—

“(1) Subject to paragraphs (1A) and (2) of this regulation, ships of the following descriptions, that is to say—

- (a) passenger ships;
- (b) cargo ships of 500 tons or over; and
- (c) cargo ships of less than 500 tons constructed on or after 1st February 1992;

which are intended, or which contain cargo spaces which are intended, for the carriage of dangerous goods on international voyages, shall comply with the protective requirements prescribed in paragraphs (4) to (12) of this regulation and the tables at the end of this regulation.

(1A) For a cargo ship of less than 500 tons, the Secretary of State may (if the ship is a United Kingdom ship) reduce the said protective requirements; and, if—

- (a) a cargo ship of less than 500 tons being a United Kingdom ship, the Secretary of State has reduced the said protective requirements; or
- (b) a cargo ship of less than 500 tons not being a United Kingdom ship, the Government of the State whose flag the ship is entitled to fly has reduced the said protective requirements pursuant to paragraph 1.1 of regulation 54 of Chapter II—2 of the International Convention for the Safety of Life at Sea 1974;

the ship may comply with the reduced requirements instead of the full protective requirements.’.

(2) At the end of sub-paragraph (f) of paragraph (6) of regulation 143, a full stop shall be substituted for the semi-colon and there shall be added—

“If a sample extraction smoke detection system is fitted, particular attention shall be paid to paragraph (1)(k) of Schedule 12 in order to prevent the leakage of toxic fumes into occupied areas;’.

Regulation 144

28.—(1) At the beginning of regulation 144, immediately before the words “Where these Regulations require” there shall be inserted the number “(1)”.

(2) In the paragraph so numbered paragraph (1)—

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- (a) for the words “the Secretary of State may permit” there shall be substituted the words “the Secretary of State shall permit”; and
 - (b) for the words “may approve any other fitting” there shall be substituted the words “shall approve any other fitting”.
- (3) After the paragraph so numbered (1) there shall be added the following paragraph—
- “(2) For the purposes of these Regulations, the results of a verification or test shall be accepted if the verification or test is carried out—
 - (a) in accordance with these Regulations or with a standard, code of practice, specification or technical description of a member State other than the United Kingdom offering equivalent levels of safety, suitability and fitness for purpose; and
 - (b) by a body or laboratory of a member State other than the United Kingdom offering suitable and satisfactory guarantees of technical and professional competence and independence.”.

Schedule 14

29.—(1) For the reference note at the head of Schedule 14 there shall be substituted the following reference note—

“Regulations 49(2) and (5)(a) and 50(2)(a)”.

(2) For the heading to Schedule 14 there shall be substituted the following heading—

“Inert Gas Systems: Standard Requirements”.

(3) In paragraph (1) of Schedule 14, after the words “in accordance with” there shall be inserted the words “regulation 49(2) or (5)(a) of”.

(4) In paragraph (19) of Schedule 14—

(a) at the beginning of sub-paragraph (a), for the words “Audible and visual alarms shall be provided to indicate:” there shall be substituted the following words—

“For an inert gas system of the flue gas type (whatever the date of construction of the ship) and for an inert gas system of the inert gas generator type in a ship constructed on or after 1st February 1992, audible and visual alarms shall be provided to indicate:”;

(b) after the said sub-paragraph (a) there shall be inserted the following sub-paragraph—

“(aa) For an inert gas system of the inert gas generator type in a ship constructed before 1st February 1992, audible and visual alarms shall be provided to indicate as stated in paragraphs (i), (iii) and (v) to (ix) of sub-paragraph (a) of this paragraph.”;

(c) at the beginning of sub-paragraph (b), for the words from “In the system” to “to indicate:” there shall be substituted the following words—

“For an inert gas system of the inert gas generator type (whatever the date of construction of the ship) additional alarms (which, in the case of a ship constructed on or after 1st February 1992, must be audible and visual) shall be provided to indicate:”.

Schedules 15 and 16

30. After Schedule 14 there shall be inserted the following Schedules—

“SCHEDULE 15

Regulation 49(2A)(a) and 50(2)(b)

Inert Gas Systems: Alternative Requirements for Chemical Tankers

- (a) (1) Every inert gas system provided in accordance with regulation 49(2A)(a) of these Regulations shall be designed, constructed and tested to the satisfaction of the Secretary of State.
- (b) In this Schedule a reference to a cargo tank includes a reference to a slop tank containing cargo residues.
- (2) The system shall be capable of:
 - (a) inerting empty cargo tanks by reducing the oxygen content of the atmosphere in each tank to a level at which combustion cannot be supported;
 - (b) maintaining the atmosphere, in all parts of each cargo tank designated to carry flammable products requiring protection by an inert gas system, with an oxygen content not exceeding 8 per cent by volume and at a positive pressure at all times in port and at sea except when it is necessary for such a tank to be gas-free;
 - (c) eliminating the need for air to enter a tank during normal operations except when it is necessary for such a tank to be gas-free;
 - (d) purging empty cargo tanks of flammable vapour, so that subsequent gas-freeing operations will at no time create a flammable atmosphere within the tanks.
- (a) (3) The system shall be capable of delivering inert gas to the cargo tanks at a rate of at least 125 per cent of the maximum rate of discharge capacity of the ship expressed as a volume. The Secretary of State may accept an inert gas system having a lower delivery capacity provided that the maximum rate of discharge of cargoes from cargo tanks being protected by the system is restricted to 80 per cent of the inert gas capacity.
- (b) The system shall be capable of delivering inert gas with an oxygen content of not more than 5 per cent by volume in the inert gas supply main to the cargo tanks at any required rate of flow.
- (a) (4) Suitable fuel in sufficient quantity shall be provided for the inert gas generators.
- (b) The inert gas generators shall be located outside the cargo tank area as defined in the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk and the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk. Spaces containing inert gas generators shall have no direct access to accommodation, service or control station spaces, but may be located in machinery spaces. If they are not located in machinery spaces, they shall be located in a compartment reserved solely for their use. Such a compartment shall be separated by a gastight steel bulkhead or deck from accommodation, service and control station spaces. Adequate positive-pressure-type mechanical ventilation shall be provided for such a compartment. Access to such compartments located aft shall be only from an open deck outside the cargo tank area. Access shall be located on the end bulkhead not facing the cargo area or on the outboard side of the superstructure or deckhouse at a distance of at least 25 per cent of the length of the ship but not less than 5 metres from the end of the superstructure or deckhouse facing the cargo area. In the case of such a compartment being located in the forecastle, access shall be through the deckhead forward of the cargo area.
- (c) Inert gas piping systems shall not pass through accommodation, service and control station spaces.
- (a) (5) Means shall be provided which will effectively cool the volume of gas specified by paragraph (3) of this Schedule and remove solids and sulphur combustion

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products. The cooling water arrangements shall be such that an adequate supply of water will always be available without interfering with any essential services on the ship. Provision shall also be made for an alternative supply of cooling water.

- (b) Filters or equivalent devices shall be fitted to minimise the amount of water carried over to the inert gas main.
- (a) (6) Two air blowers shall be fitted to each inert gas generator, which together shall be capable of delivering to the cargo tanks required to be protected by the system at least the volume of gas required by paragraph (3) of this Schedule. The Secretary of State may permit only one blower if it is capable of delivering to the protected cargo tanks the total volume of gas required by paragraph (3) of this Schedule, provided that sufficient spares for the air blower and its prime mover are carried on board to enable any failure of the air blower and its prime mover to be rectified.
- (b) The inert gas system shall be so designed that the maximum pressure which it can exert on any cargo tank will not exceed the test pressure of that tank.
- (c) Where more than one inert gas generator is provided, suitable shut-off arrangements shall be provided on the discharge outlet of each generator plant.
- (d) Arrangements shall be made to vent the inert gas to the atmosphere in case the inert gas produced is sub-standard, eg during starting-up or in case of equipment failure.
- (e) Where inert gas generators are served by positive displacement blowers, a pressure relief device shall be provided to prevent excess pressure being developed on the discharge side of the blower.

(7) Two fuel oil pumps shall be fitted to each inert gas generator. The Secretary of State may permit only one fuel oil pump on condition that sufficient spares for the fuel oil pump and its prime mover are carried on board to enable any failure of the fuel oil pump and its prime mover to be rectified by the ship's crew.

(8) A gas-regulating valve shall be fitted in the inert gas supply main. This valve shall be automatically controlled to close as required by paragraph (17)(b) and (c) of this Schedule. It shall also be capable of automatically regulating the flow of inert gas to the cargo tanks unless other means are provided to control automatically the inert gas flow rate.

- (a) (9) At least two non-return devices, one of which shall be a water seal, shall be fitted in the inert gas supply main in order to prevent the return of flammable vapour to the inert gas generator and to any gas-safe space under all normal conditions of trim, list and motion of the ship. They shall be located between the automatic valve required by paragraph (8) of this Schedule and the first connection to any cargo tank or cargo pipeline. The Secretary of State may permit an alternative arrangement or device providing a measure of safety equivalent to that of a water seal.
- (b) The devices referred to in sub-paragraph (a) of this paragraph shall be located in the cargo tank area on deck.
- (c) The water seal referred to in sub-paragraph (a) of this paragraph shall be capable of being supplied by two separate pumps, each of which shall be capable of maintaining an adequate supply at all times.
- (d) The arrangement of the water seal and its associated provisions shall be such that it will prevent backflow of flammable vapours and will ensure the proper functioning of the water seal under operating conditions.
- (e) Provision shall be made to ensure that any water seal is protected against freezing, in such a way that the integrity of the water seal is not impaired by overheating.
- (f) A water loop or other approved arrangement shall also be fitted to all associated water supply and drain piping and to all venting or pressure-sensing piping leading to gas-

safe places. Means shall be provided to prevent such loops from being emptied by vacuum.

- (g) Any water seal or equivalent device and all loop arrangements shall be capable of preventing the return of flammable vapours to an inert gas generator at a pressure equal to the test pressure of the cargo tanks.
- (h) The second device shall be a non–return valve or equivalent capable of preventing the return of vapours or liquids or both and fitted between the water seal or the equivalent device required by sub–paragraph (a) of this paragraph and the first connection from the inert gas main to a cargo tank. It shall be provided with positive means of closure. As an alternative to positive means of closure, an additional valve having such means of closure may be provided between the non– return valve and the first connection to the cargo tanks to isolate the water seal or equivalent device.
- (i) As an additional safeguard against the possible leakage of flammable liquids or vapours back from the deck main, means shall be provided to permit the section of the line between the valve having positive means of closure referred to in sub– paragraph (h) of this paragraph and the valve referred to in paragraph (8) of this Schedule to be vented in a safe manner when the first of these valves is closed.
- (a) (10) The inert gas main may be divided into two or more branches between the non– return devices required by paragraph (9) of this Schedule and the cargo tanks.
- (b) Inert gas supply mains shall be fitted with branch piping leading to each cargo tank designated for the carriage of flammable products required to be inerted by this Schedule. Each cargo tank containing or loading products not required to be inerted shall be separated from the inert gas main by:
 - (i) removing spool pieces, valves or other pipe sections, and blanking the pipe ends;
or
 - (ii) an arrangement of two spectacle flanges in series with provision for detecting leakage into the pipe between the two spectacle flanges.
- (c) Means shall be provided to protect cargo tanks against the effect of overpressure or vacuum caused by thermal variations when the tanks are isolated from the inert gas mains.
- (d) Piping systems shall be so designed as to prevent the accumulation of cargo or water in the pipelines under all normal conditions.
- (e) Suitable arrangements shall be provided to enable the inert gas main to be connected to an external supply of inert gas.

(11) Unless the arrangements for venting of all vapours displaced from the cargo tanks during loading and ballasting comply with the requirements of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk or the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk for controlled venting, such arrangements shall comply with regulation 12 of the Merchant Shipping (Cargo Ship Construction and Survey) Regulations 1984 and shall consist either of one or more mast risers or of a number of high velocity vents.

(12) The arrangements for inerting, purging or gas–freeing of empty tanks as required by paragraph (2) of this Schedule shall be to the satisfaction of the Secretary of State and shall be such that the accumulation of hydrocarbon vapours in pockets formed by the internal structural members in a tank is minimised and that:

- (a) on individual cargo tanks the gas outlet pipe, if fitted, shall be positioned as far as practicable from the inert gas/air inlet and in accordance with regulation 12(5)(c) of the Merchant Shipping (Cargo Ship Construction and Survey) Regulations 1984, or

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paragraph 8.2.2.3 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk. The inlet of such outlet pipes may be located either at deck level or not more than 1 metre above the bottom of the tank;

- (b) the cross-sectional area of such gas outlet pipe referred to in sub-paragraph (a) of this paragraph shall be such that an exit velocity of at least 20 metres per second can be maintained when any three tanks are being simultaneously supplied with inert gas. Their outlets shall extend not less than 2 metres above deck level. When in accordance with paragraph (3) of this Schedule the Secretary of State permits a system designed to supply only one tank or two tanks simultaneously, the outlet pipes shall be sized such that an exit velocity in the outlet pipes of 20 metres per second can be maintained;
 - (c) each gas outlet referred to in sub-paragraph (b) of this paragraph shall be fitted with suitable blanking arrangements.
- (13) Means shall be provided for continuously indicating the temperature and pressure of the inert gas at the discharge side of the system, whenever it is operating.
- (a) (14) Instrumentation shall be fitted for continuously indicating and permanently recording, when the inert gas is being supplied:
 - (i) the pressure of the inert gas supply mains between the non-return devices required by paragraph (9)(a) of this Schedule and the cargo tanks; and
 - (ii) the oxygen content of the inert gas in the inert gas supply main.
 - (b) The devices referred to in sub-paragraph (a) of this paragraph shall be placed in the cargo control room where provided. Where no cargo control room is provided, they shall be placed in a position easily accessible to the officer in charge of cargo operations.
 - (c) In addition, meters shall be fitted:
 - (i) in the navigating bridge to indicate at all times the pressure referred to in sub-paragraph (a)(i) of this paragraph; and
 - (ii) in the machinery control room or in the machinery space to indicate the oxygen content referred to in sub-paragraph (a)(ii) of this paragraph.
- (15) Portable instruments for measuring oxygen and flammable vapour concentration shall be provided. In addition, suitable arrangements shall be made on each cargo tank such that the condition of the tank atmosphere can be determined using these portable instruments.
- (16) Suitable means shall be provided for the zero and span calibration of both fixed and portable gas concentration measurement instruments, referred to in paragraphs (14) and (15) of this Schedule.
- (a) (17) Audible and visual alarms shall be provided to indicate:
 - (i) low water pressure or low water flow rate to the cooling and scrubbing arrangements referred to in paragraph (5)(a) of this Schedule;
 - (ii) low fuel supply;
 - (iii) high gas temperature referred to in paragraph (13) of this Schedule;
 - (iv) failure of the power supply to the inert gas generators;
 - (v) oxygen content in excess of 8 per cent by volume referred to in paragraph (14)(a)(ii) of this Schedule;
 - (vi) failure of the power supply to the indicating devices referred to in paragraph 14(a) and to the automatic control systems for the gas-regulating valve referred to in paragraph (8) of this Schedule and the inert gas generator;
 - (vii) low water level in the water seal referred to in paragraph (9) of this Schedule;

- (viii) gas pressure less than 100 millimetres water gauge referred to in paragraph (14)(a) of this Schedule;
 - (ix) high gas pressure referred to in paragraph (14)(a)(i) of this Schedule.
 - (b) Automatic shutdown of the gas-regulating valve and of the fuel oil supply to the inert gas generator shall be arranged on predetermined limits being reached in respect of sub-paragraph (a)(i) and (iii) of this paragraph.
 - (c) Automatic shutdown of the gas-regulating valve shall be arranged in respect of sub-paragraph (a)(iv) of this paragraph.
 - (d) In respect of sub-paragraph (a)(v) of this paragraph, when the oxygen content of the inert gas exceeds 8 per cent by volume, immediate action shall be taken to improve the gas quality. Unless the quality of the inert gas improves, all operations in those tanks to which inert gas is being supplied shall be suspended so as to avoid air being drawn into the tanks. The deck isolation valve referred to in paragraph (9)(h) of this Schedule shall be closed, and the sub-standard gas shall be vented to atmosphere.
 - (e) The alarms required by sub-paragraph (a)(v), (vi) and (viii) of this paragraph shall be fitted in the machinery space and cargo control room, where provided, but in each case in such a position that they are immediately received by responsible members of the crew. All other alarms required by this paragraph shall be audible to responsible members of the crew either as individual alarms or as a group alarm.
 - (f) In respect of sub-paragraph (a)(vii) of this paragraph, the Secretary of State shall be satisfied as to the maintenance of an adequate reserve of water at all times and the integrity of the arrangements to permit the automatic formation of the water seal when the gas flow ceases. The audible and visual alarm on the low level of water in the water seal shall operate when the inert gas is not being supplied.
 - (g) An audible alarm system, independent of that required by sub-paragraph (a)(viii) of this paragraph, or automatic shutdown of cargo pumps shall be provided to operate on pre-determined limits of low pressure in the inert gas mains being reached.
- (18) Detailed instruction manuals shall be provided on board, covering the operations, safety and maintenance requirements and occupational health hazards relevant to the inert gas system and its application to the cargo tank system. The manuals shall include guidance on procedures to be followed in the event of a fault or failure of the inert gas system.

SCHEDULE 16

Regulation 49(2A)(b) and 50(2)(b)

Inert Gas Systems: Alternative Requirements for Chemical Tankers Constructed before 1st July 1986 and carrying Crude Oil or Petroleum Products

- (a) (1) Every inert gas system provided in accordance with regulation 49(2A)(b) of these Regulations shall be designed, constructed and tested to the satisfaction of the Secretary of State.
 - (b) In this Schedule a reference to a cargo tank includes a reference to a slop tank containing oil residues.
- (2) The system shall be capable of:
- (a) inerting empty cargo tanks by reducing the oxygen content of the atmosphere in each tank to a level at which combustion cannot be supported;
 - (b) maintaining the atmosphere in all parts of each cargo tank designated to carry flammable products requiring protection by an inert gas system with an oxygen content

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not exceeding 8 per cent by volume and at a positive pressure at all times in port and at sea except when it is necessary for such a tank to be gas-free;

- (c) eliminating the need for air to enter a tank during normal operations except when it is necessary for such a tank to be gas-free;
 - (d) purging empty cargo tanks of flammable vapour, so that subsequent gas-freeing operations will at no time create a flammable atmosphere within the tanks.
- (a) (3) The system shall be capable of delivering inert gas to the cargo tanks at a rate of at least 125 per cent of the maximum rate of discharge capacity of the ship expressed as a volume. The Secretary of State may accept an inert gas system having a lower delivery capacity provided that the maximum rate of discharge of cargoes from cargo tanks being protected by the system is restricted to 80 per cent of the inert gas capacity.
- (b) The system shall be capable of delivering inert gas with an oxygen content of not more than 5 per cent by volume in the inert gas supply main to the cargo tanks at any required rate of flow.
- (a) (4) Suitable fuel in sufficient quantity shall be provided for the inert gas generators.
- (b) The inert gas generators shall be located outside the cargo tank area as defined in the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk. Spaces containing inert gas generators shall have no direct access to accommodation, service or control station spaces, but may be located in machinery spaces. If they are not located in machinery spaces, they shall be located in a compartment reserved solely for their use. Such a compartment shall be separated by a gastight steel bulkhead or deck from accommodation, service and control station spaces. Adequate positive-pressure-type mechanical ventilation shall be provided for such a compartment. Access to such compartments located aft shall be only from an open deck outside the cargo tank area. Access shall be located on the end bulkhead not facing the cargo area or on the outboard side of the superstructure or deckhouse at a distance of at least 25 per cent of the length of the ship but not less than 5 metres from the end of the superstructure or deckhouse facing the cargo area. In the case of such a compartment being located in the forecastle, access shall be through the deckhead forward of the cargo area.
- (c) Inert gas piping systems shall not pass through accommodation, service and control station spaces.
- (a) (5) Means shall be provided which will effectively cool the volume of gas specified by paragraph (3) of this Schedule and remove solids and sulphur combustion products. The cooling water arrangements shall be such that an adequate supply of water will always be available without interfering with any essential services on the ship. Provision shall also be made for an alternative supply of cooling water.
- (b) Filters or equivalent devices shall be fitted to minimise the amount of water carried over to the inert gas main.
- (a) (6) Two air blowers shall be fitted to each inert gas generator, which together shall be capable of delivering to the cargo tanks required to be protected by the system at least the volume of gas required by paragraph (3) of this Schedule. The Secretary of State may permit only one blower if it is capable of delivering to the protected cargo tanks the total volume of gas required by paragraph (3) of this Schedule, provided that sufficient spares for the air blower and its prime mover are carried on board to enable any failure of the air blower and its prime mover to be rectified.
- (b) The inert gas system shall be so designed that the maximum pressure which it can exert on any cargo tank will not exceed the test pressure of that tank.

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- (c) Where more than one inert gas generator is provided, suitable shut-off arrangements shall be provided on the discharge outlet of each generator plant.
- (d) Arrangements shall be made to vent the inert gas to the atmosphere in case the inert gas produced is sub-standard, eg during starting-up or in case of equipment failure.
- (e) Where inert gas generators are served by positive displacement blowers, a pressure relief device shall be provided to prevent excess pressure being developed on the discharge side of the blower.

(7) Two fuel oil pumps shall be fitted to each inert gas generator. The Secretary of State may permit only one fuel oil pump on condition that sufficient spares for the fuel oil pump and its prime mover are carried on board to enable any failure of the fuel oil pump and its prime mover to be rectified by the ship's crew.

(8) A gas-regulating valve shall be fitted in the inert gas supply main. This valve shall be automatically controlled to close as required by paragraph (17)(b) and (c) of this Schedule. It shall also be capable of automatically regulating the flow of inert gas to the cargo tanks unless other means are provided to control automatically the inert gas flow rate.

- (a) (9) At least two non-return devices, one of which shall be a water seal, shall be fitted in the inert gas supply main in order to prevent the return of flammable vapour to the inert gas generator and to any gas-safe space under all normal conditions of trim, list and motion of the ship. They shall be located between the automatic valve required by paragraph (8) of this Schedule and the first connection to any cargo tank or cargo pipeline. The Secretary of State may permit an alternative arrangement or device providing a measure of safety equivalent to that of a water seal.
- (b) The devices referred to in sub-paragraph (a) of this paragraph shall be located in the cargo tank area on deck.
- (c) The water seal referred to in sub-paragraph (a) of this paragraph shall be capable of being supplied by two separate pumps, each of which shall be capable of maintaining an adequate supply at all times.
- (d) The arrangement of the water seal and its associated provisions shall be such that it will prevent backflow of flammable vapours and will ensure the proper functioning of the water seal under operating conditions.
- (e) Provision shall be made to ensure that any water seal is protected against freezing, in such a way that the integrity of the water seal is not impaired by overheating.
- (f) A water loop or other approved arrangement shall also be fitted to all associated water supply and drain piping and to all venting or pressure-sensing piping leading to gas-safe spaces. Means shall be provided to prevent such loops from being emptied by vacuum.
- (g) Any water seal or equivalent device and all loop arrangements shall be capable of preventing the return of flammable vapours to an inert gas generator at a pressure equal to the test pressure of the cargo tanks.
- (h) The second device shall be a non-return valve or equivalent capable of preventing the return of vapours or liquids or both and fitted between the water seal or the equivalent device required by sub-paragraph (a) of this paragraph and the first connection from the inert gas main to a cargo tank. It shall be provided with positive means of closure. As an alternative to positive means of closure, an additional valve having such means of closure may be provided between the non-return valve and the first connection to the cargo tanks to isolate the water seal or equivalent device.
- (i) As an additional safeguard against the possible leakage of flammable liquids or vapours back from the deck main, means shall be provided to permit the section of the line

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between the valve having positive means of closure referred to in sub-paragraph (h) of this paragraph and the valve referred to in paragraph (8) of this Schedule to be vented in a safe manner when the first of these valves is closed.

- (a) (10) The inert gas main may be divided into two or more branches between the non-return devices required by paragraph (9) of this Schedule and the cargo tanks.
 - (b) Inert gas supply mains shall be fitted with branch piping leading to each cargo tank designated for the carriage of flammable products required to be inerted by this Schedule. Each cargo tank containing or loading products not required to be inerted shall be separated from the inert gas main by:
 - (i) removing spool pieces, valves or other pipe sections, and blanking the pipe ends; or
 - (ii) an arrangement of two spectacle flanges in series with provision for detecting leakage into the pipe between the two spectacle flanges.
 - (c) Means shall be provided to protect cargo tanks against the effect of overpressure or vacuum caused by thermal variations when the cargo tanks are isolated from the inert gas mains.
 - (d) Piping systems shall be so designed as to prevent the accumulation of cargo or water in the pipelines under all normal conditions.
 - (e) Suitable arrangements shall be provided to enable the inert gas main to be connected to an external supply of inert gas.
- (11) Unless the arrangements for venting of all vapours displaced from the cargo tanks during loading and ballasting comply with the requirements of the Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk for controlled venting, such arrangements shall comply with regulation 12 of the Merchant Shipping (Cargo Ship Construction and Survey) Regulations 1984 and shall consist either of one or more mast risers or a number of high velocity vents. The inert gas supply mains shall not be used for such venting.
- (a) (12) The arrangements for inerting, purging or gas-freeing of empty tanks as required by paragraph (2) of this Schedule shall be to the satisfaction of the Secretary of State and shall be such that the accumulation of flammable vapours in pockets formed by the internal structural members in a tank is minimised.
 - (b) When in accordance with paragraph (3) of this Schedule the Secretary of State permits a system designed to supply only one tank or two tanks simultaneously, the outlet pipes shall be sized such that an exit velocity in the outlet pipes of 20 metres per second can be maintained.
- (13) Means shall be provided for continuously indicating the temperature and pressure of the inert gas at the discharge side of the system, whenever it is operating.
- (a) (14) Instrumentation shall be fitted for continuously indicating and permanently recording, when the inert gas is being supplied:
 - (i) the pressure of the inert gas supply mains between the non-return devices required by paragraph (9)(a) of this Schedule and the cargo tanks; and
 - (ii) the oxygen content of the inert gas in the inert gas supply main.
 - (b) The devices referred to in sub-paragraph (a) of this paragraph shall be placed in the cargo control room where provided. Where no cargo control room is provided, they shall be placed in a position easily accessible to the officer in charge of cargo operations.
 - (c) In addition, meters shall be fitted:
 - (i) in the navigating bridge to indicate at all times the pressure referred to in sub-paragraph (a)(i) of this paragraph; and

(ii) in the machinery control room or in the machinery space to indicate the oxygen content referred to in sub-paragraph (a)(ii) of this paragraph.

(15) Portable instruments for measuring oxygen and flammable vapour concentration shall be provided. In addition, suitable arrangements shall be made on each cargo tank such that the condition of the tank atmosphere can be determined using these portable instruments.

(16) Suitable means shall be provided for the zero and span calibration of both fixed and portable gas concentration measurement instruments, referred to in paragraphs (14) and (15) of this Schedule.

- (a) (17) Audible and visual alarms shall be provided to indicate:
- (i) low water pressure or low water flow rate to the cooling and scrubbing arrangement referred to in paragraph (5)(a) of this Schedule;
 - (ii) low fuel supply;
 - (iii) high gas temperature referred to in paragraph (13) of this Schedule;
 - (iv) failure of the power supply to the inert gas generators;
 - (v) oxygen content in excess of 8 per cent by volume referred to in paragraph (14)(a)(ii) of this Schedule;
 - (vi) failure of the power supply to the indicating devices referred to in paragraph (14)(a) of this Schedule and to the automatic control systems for the gas-regulating valve referred to in paragraph (8) of this Schedule and the inert gas generator;
 - (vii) low water level in the water seal referred to in sub-paragraph (9)(a) of this Schedule;
 - (viii) gas pressure less than 100 millimetres water gauge referred to in paragraph (14)(a) of this Schedule;
 - (ix) high gas pressure referred to in paragraph (14)(a)(i) of this Schedule.
- (b) Automatic shutdown of the gas-regulating valve and of the fuel oil supply to the inert gas generator shall be arranged on pre-determined limits being reached in respect of sub-paragraph (a)(i) and (iii) of this paragraph.
- (c) Automatic shutdown of the gas-regulating valve shall be arranged in respect of sub-paragraph (a)(iv) of this paragraph.
- (d) In respect of sub-paragraph (a)(v) of this paragraph, when the oxygen content of the inert gas exceeds 8 per cent by volume, immediate action shall be taken to improve the gas quality. Unless the quality of the inert gas improves, all operations in those tanks to which inert gas is being supplied shall be suspended so as to avoid air being drawn into the tanks. The deck isolation valve referred to in paragraph (9)(h) of this Schedule shall be closed, and the sub-standard gas shall be vented to atmosphere.
- (e) The alarms required by sub-paragraph (a)(v), (vi) and (viii) of this paragraph shall be fitted in the machinery space and cargo control room, where provided, but in each case in such a position that they are immediately received by responsible members of the crew. All other alarms required by this paragraph shall be audible to responsible members of the crew either as individual alarms or as a group alarm.
- (f) In respect of sub-paragraph (a)(vii) of this paragraph, the Secretary of State shall be satisfied as to the maintenance of an adequate reserve of water at all times and the integrity of the arrangements to permit the automatic formation of the water seal when the gas flow ceases. The audible and visual alarm on the low level of water in the water seal shall operate when the inert gas is not being supplied.

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- (g) An audible alarm system, independent of that required by sub-paragraph (a)(viii) of this paragraph, or automatic shutdown of cargo pumps shall be provided to operate on predetermined limits of low pressure in the inert gas mains being reached.

(18) Detailed instruction manuals shall be provided on board, covering the operations, safety and maintenance requirements and occupational health hazards relevant to the inert gas system and its application to the cargo tank system. The manuals shall include guidance on procedures to be followed in the event of a fault or failure of the inert gas system.”

EXPLANATORY NOTE

(This note is not part of the Regulations)

These Regulations further amend the Merchant Shipping (Fire Protection) Regulations 1984. They also make an amendment to the Merchant Shipping (Fire Protection) (Amendment) Regulations 1992.

The Regulations give effect to amendments to Chapter II—2 of the Annex to the International Convention for the Safety of Life at Sea 1974 (as amended). The amendments, which were adopted by the Maritime Safety Committee (“MSC”) of the International Maritime Organization (“IMO”) at its 57th and 59th Sessions, are contained in Annexes to the following Resolutions of the MSC—

- (a) Resolution MSC 13(57), adopted on 11th April 1989; and
- (b) Resolution MSC 22(59), adopted on 23rd May 1991.

The Regulations include provisions alternative to the existing requirements for inert gas systems on chemical tankers and gas carriers, and provision for fire-extinguishing systems for paint lockers and flammable liquid lockers. For ships constructed on or after 1st February 1992, the Regulations include provision—

- (i) in respect of helicopter decks;
- (ii) amending the restrictions as to the use of combustible materials in the structure of a ship;
- (iii) amending the definitions of low risk and high risk service areas;
- (iv) providing for fire hoses to be of non-perishable material;
- (v) extending to United Kingdom cargo ships of less than 500 gross tons the requirements for ships carrying dangerous goods.

The Regulations make additional requirements for passenger ships constructed on or after 1st January 1994 with public spaces spanning three or more decks (atriums). They also make minor and drafting amendments.

A compliance cost assessment has been prepared, and copies may be obtained from the Department of Transport, Room 2/27B, Spring Place, 105 Commercial Road, Southampton SO1 0ZD. A copy has been placed in the library of each House of Parliament.

Copies of the ISO standard referred to in the Regulations may be obtained from the British Standards Institution, Linford Wood, Milton Keynes, MK14 6L. Copies of the IMO Resolutions and Annexes, and of the Codes mentioned in the Regulations, may be obtained from IMO, 4 Albert Embankment, London, SE1 7SR.

Document Generated: 2023-06-03

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