CAYMAN ISLANDS

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THE MERCHANT SHIPPING (MARINE POLLUTION) LAW 2001

THE MERCHANT SHIPPING (MARINE POLLUTION) REGULATIONS, 2004

ARRANGEMENT OF REGULATIONS

SCHEDULES

THE MERCHANT SHIPPING LAW (2001 REVISION)

THE MERCHANT SHIPPING (TONNAGE) REGULATIONS, 2002

The Governor, in exercise of the powers conferred on him by section 73 of the Merchant Shipping (Marine Pollution) Law, 2001, makes the following Regulations:

PART I - General

Citation

1. These Regulations may be cited as the Merchant Shipping (Tonnage) Regulations, 2002.

Interpretation

2. In these Regulations, unless the context otherwise requires-

"amidships" means at the middle of the length ;

"area" in relation to a ship shall be calculated in all cases to moulded lines;

"breadth" or "B" means the maximum breadth of the ship, measured amidships to the moulded line of the frame in a ship with a metal shell and to the outer surface of the hull in a ship with a shell of any other material, measured in metres;

"centre tank" means any tank inboard of a longitudinal bulkhead;

"Certifying Authority" means the Director or a surveyor or organization authorised under section 43 of the Law;

"deadweight" or "DW" means the difference in metric tons between the displacement of a ship in water of a specific gravity of 1.025 at the load waterline corresponding to the assigned summer freeboard and the lightweight of the ship;

"existing ship", without prejudice to regulation 6(2), means a ship which is not a new ship;

"filtering equipment" mean filters or any combination of separators and filters which are designed to produce effluent containing not more than 15 parts per million of oil;

"flag state" means the state whose flag a ship is entitled to fly;

"forward and after perpendiculars" shall be taken at the forward and after ends of the length and the forward perpendicular shall coincide with the foreside of the stem on the waterline on which the length is measured;

"Government ship" has the meaning given in section 2(1) of the Merchant Shipping Law, (2001 Revision);

"gross tonnage" means the gross tonnage as determined under the International Convention on Tonnage Measurement, 1969, as amended, or under regulations relating to tonnage measurement made under the Merchant Shipping Law (2001 Revision), the ship has alternative tonnages, means the larger of those tonnages;

"Guidelines and Specifications for Oil Discharge Monitoring and Control Systems for Oil Tankers" means Resolution A496(XII) adopted by the Organization and contained in the 1987 Edition of Oily Water Separators and Monitoring Equipment, published by the Organization;

"Law" means the Merchant Shipping (Marine Pollution) Law, 2001;

"length" or "L" means 96 percent of the total length on a waterline at 85 percent of the least moulded depth measured from the top of the keel, or the length from the foreside of the stem to the axis of the rudder stock on that waterline, if that be greater, and in ships designed with a rake of keel the waterline on which this length is measured shall be parallel to the designed waterline; the length shall be measured in metres;

"lightweight" means the displacement of a ship in metric tons without cargo, fuel, lubricating oil, ballast water, fresh water and feed water in tanks, consumable stores, and passengers and crew and their effects;

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"major conversion" means a conversion of an existing ship-

(a) which substantially alters the dimensions or carrying capacity of the ship;
(b) which changes the type of the ship;
(c) the intent of which, in the opinion of the Director, is substantially to prolong its life; or
(d) which otherwise so alters the ship that, if it were a new ship, it would become subject to the relevant provisions of MARPOL not applicable to it as an existing ship,

but conversion of-

(e) an existing oil tanker of 20,000 tons deadweight and above to meet the requirements of regulation 7; or
(f) an existing oil tanker to meet the requirements of regulation 20, shall not be deemed to constitute a major conversion;

"new ship", except as provided in regulation 6(1), means a ship-

(a) for which the building contract was placed after 31st December 1975;
(b) in the absence of a building contract, the keel of which was laid or which was at a similar stage of construction after 30th June 1976;
(c) the delivery of which is after 31st December 1979; or
(d) which has undergone a major conversion-
  (i) for which the contract was placed after 31st December 1975;
  (ii) in the absence of a contract, the construction work of which was begun after 30th June 1976; or
  (iii) which is or was completed after 31st December 1979;

"Oil Record Book" means the Oil Record Book referred to in section 69 of the Law;

"permeability" of a space means the ratio of the volume within that space which is assumed to be occupied by water to the total volume of that space;

"product carrier" means an oil tanker engaged in the trade of carrying oil other than crude oil;

"Recommendations on International Performance and Test Specifications for Oily Water Separating Equipment and Oil Content Meters" means Resolution A393(XI) of that title adopted by the Organization as modified, by the Marine Environment Protection Committee's Resolution 60(33) contained in the 1987 Edition of Oily Water Separators and Monitoring Equipment published by the Organization;

"separating equipment" means either separators or filters, or any combination of them, which are designed to produce effluent containing not more than 100 parts per million of oil;

"Specifications for Oil Tankers with Dedicated Clean Ballast Tanks" means the Organization's Resolution Number A495 (XII) contained in the 1982 Edition of Dedicated Clean Ballast Tanks published by the Organization;

"Specifications for Oil/Water Interface Detectors" means the Organization's Resolution Number MEPC 5(XIII), contained in the 1987 Edition of Oily Water Separators and Monitoring Equipment, published by the Organization;

"Specifications for the Design, Operation and Control of Crude Oil Washing Systems", means the Organization's Resolution Number A446(XI) contained in the 1983 Edition of Crude Oil Washing Systems, published by the Organization; "tank" means an enclosed space which is formed by the permanent structure of a ship and which is designed for the carriage of liquid in bulk;

"volume" in relation to a ship shall be calculated in all cases to moulded lines; And

"wing tank" means any tank adjacent to the side shell plating.

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(2) In these Regulations references to publications of the Organization include references to amendments thereto or replacements thereof.

Applications and exemptions

3. (1) Unless expressly provided otherwise, these Regulations apply to-

(a) Cayman Islands ships;
(b) other ships while they are within the Islands or Cayman Islands protected waters; and
(c) Government ships as defined in section 2(1) of the Merchant Shipping Law, (2001 Revision).

(2) These Regulations do not apply to a warship, naval auxiliary or other ship owned or operated by a State and used, for the time being, only on government non-commercial service.

(3) The Director may exempt a ship of a new type whose constructional features are such as to render the application of the regulations relating to construction and equipment unreasonable or impracticable from those provisions, provided that the construction and equipment of that ship provide equivalent protection against pollution by oil, having regard to the service for which it is intended, and particulars of any such exemption granted by the Director shall be indicated in the IOPP Certificate.

(4) In ships, other than oil tankers, fitted with cargo spaces which are constructed and used to carry oil in bulk of an aggregate capacity of 200 cubic metres or more, the requirements of regulations 5(1), (2) and (3), 13, 15 and 17(4) for oil tankers shall also apply to the construction and operation of these spaces, except that where such aggregate capacity is less than 1,000 cubic metres it shall be sufficient to comply with the requirements of regulation 5(4) as if they applied to the ship in lieu of those of regulations 5(l), (2) and (3).

(5) The Director may grant exemptions from all or any of these Regulations, as may be specified in the exemption, for classes of ships or individual ships on such terms, if any, as he may so specify and may, subject to giving reasonable notice, alter or cancel any such exemption.

PART II - Requirements for Control of Operational Pollution

Oil filtering equipment and oil discharge monitoring and control system

4. (1) Subject to paragraph (3), every ship of 400 gross tonnage and above but less than 10,000 gross tonnage shall be fitted with oil filtering equipment complying with paragraph (5); and any such ship which carries ballast water in its bunker fuel tanks shall, in addition-

(a) (i) be provided with an alarm device and the means for automatically stopping the discharge of oily mixtures when the oil content in the effluent exceeds 15 parts per million complying with the specifications referred to in paragraph (6); and
(ii) not discharge such ballast water into the sea unless using that equipment and a record of any such discharge shall be made in the Oil Record Book; or

(b) discharge the ballast water to reception facilities.

(2) Subject to paragraph (3), every ship which is of 10,000 gross tonnage and above shall be provided with-

(a) oil filtering equipment complying with paragraph (5); and
(b) oil content measuring equipment fitted with a 15 parts per million alarm device and with arrangements for automatically stopping the discharge of oily mixtures when the oil content in the effluent exceeds 15 parts per million, both complying with paragraph (6).

(3) The Director may waive the requirements in paragraphs (1) and (2) if a ship is engaged exclusively on voyages within special areas and-

(a) it is fitted with a holding tank having a volume adequate for the retention on board of all oily bilge water;

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(b) all oily bilge water is retained on board for subsequent discharge to reception facilities;
(c) adequate reception facilities are available to receive such oily, bilge water in a sufficient number of ports or terminals that the ship calls at;
(d) the IOPP Certificate, when required, is endorsed to the effect that the ship is exclusively engaged on voyages within special areas; and
(e) the relevant entries are recorded in the Oil Record Book.

(4) Every ship which is of less than 400 gross tonnage shall, so far as reasonably practicable be constructed to ensure that oil or oily mixtures are retained on board and discharged to reception facilities or, if oil or oily mixtures are to be discharged into the sea, are so discharged in accordance with the requirements of section 55(3) of the Law.

(5) Oil filtering equipment shall be of an approved design in accordance with the specification for such equipment set out in the Recommendations on International Performance and Test Specifications for Oily Water Separating Equipment and Oil Content Meters.

(6) Oil content measuring equipment and alarm devices shall be of an approved design in accordance with the specification for such equipment set out in the Recommendations on International Performance and Test Specifications for Oily Water Separating Equipment and Oil Content Meters, and the arrangements for automatically stopping a discharge shall be of an approved design.

Retention of oil on board and control of discharge into the sea

5. (1) Subject to paragraphs (11) and (12), oil tankers of 150 gross tonnage and above shall comply with the requirements of paragraphs (2) and (3).

(2) Adequate means shall be provided for cleaning the cargo tanks and transferring the dirty ballast residues and tank washings from the cargo tanks into a slop tank and in existing oil tankers, any cargo tank may be designated as a slop tank.

(3) Arrangements shall be provided to transfer the oil waste into a slop tank or combination of slop tanks in such a way that effluent discharges into the sea will be such as to comply with section 54(1), (2) and (4) of the Law.

(4) The slop tank or combination of slop tanks provided shall have sufficient capacity to retain the slops generated by tank washings, oil residues and dirty ballast residues, and that capacity shall be not less than 3 percent of the cargo oil carrying capacity of the ship unless-

(a) segregated ballast tanks or dedicated clean ballast tanks are provided in accordance with regulation 7, or a cargo tank cleaning system using crude oil washing in accordance with regulation 10, when the total capacity of the slop tank or tanks may be reduced to 2 percent of the oil carrying capacity of the ship; or
(b) in the case of combination carriers, the oil cargo is carried in tanks with smooth walls, when the said total capacity may be reduced to 1 percent of the oil carrying capacity of the ship, and, where the tank washing arrangements are such that, once the slop tank or tanks are charged with washing water, this water shall be sufficient for the tank washing and, where applicable, for providing the driving fluid for the pumps (including eductors) without the introduction of additional water into the system, in which case the figures of 3 percent, 2 percent and 1 percent referred to in this paragraph may be reduced to 2 percent, 1.5 percent and 0.8 percent, respectively.

(5) Slop tanks shall be so designed, particularly as regards the position of inlets, outlets, baffles or weirs (where fitted), as to avoid excessive turbulence and entrainment of oil or emulsion with water, and new oil tankers of 70,000 tons deadweight and above shall be provided with at least two slop tanks.

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(6) An oil discharge monitoring and control system of an approved design shall be fitted, which shall be-

(a) designed and installed in accordance with the Guidelines and Specifications for Oil Discharge Monitoring and Control Systems for Oil Tankers;
(b) fitted with a recording device to provide, unless otherwise required by the Guidelines and Specifications referred to in subparagraph (a), a continuous record of the discharge of oil in litres per mile and the total quantity of oil discharged or, in lieu of the total quantity of oil discharged, the oil content and rate of discharge of the effluent, and the record shall be identifiable as to the time and date and be kept for at least three years; and
(c) brought into operation when there is a discharge of effluent into the sea and shall be such as to ensure that any discharge of oily mixture is, unless otherwise permitted by the Guidelines and Specifications referred to in subparagraph (a), automatically stopped when the instantaneous rate of discharge of oil exceeds 30 litres per nautical mile.

(7) On any failure of the oil discharge monitoring and control system referred to in paragraph (6)-

(a) the discharge shall be stopped and the failure noted in the Oil Record Book.
(b) a manually operated alternative system shall be provided and may be used in the event of such a failure, but the defective unit shall be made operable as soon as possible; and
(c) where a tanker with a defective unit is within the Islands or the territorial seas thereof, the Director may allow the tanker to undertake one ballast voyage before proceeding to a repair port.

(8) Effective oil/water interface detectors, of a design approved in accordance with the Specifications for Oil/Water Interface Detectors, shall be provided for the rapid and accurate determination of the oil/water interface in slop tanks and in other tanks where the separation of oil and water is effected and from which it is intended to discharge effluent direct into the sea.

(9) Approved instruction manuals on the operation and maintenance of the various components comprising the oil discharge monitoring and control system shall be provided and the manuals shall contain information on manual as well as automatic operation and shall be so drawn up as to ensure that at no time will oil be discharged except in compliance with the conditions specified in section 54(1), (2) and (4) of the Law.

(10) Oil tankers of less than 150 gross tonnage in pursuance of section 54(1), (2) and (4) of the Law shall-

(a) retain oil and all contaminated washings on board for subsequent discharge to reception facilities;
(b) record in the Oil Record Book the total quantity of oil and water used for washing and returned to a storage or slop tank; and
(c) discharge the total quantity of oil and water referred to in subparagraph (b) to reception facilities unless adequate arrangements are made to ensure that effluent which is discharged into the sea is effectively monitored in compliance with section 54(1), (2) and (4) of the Law.

(11) (a) paragraphs (1) to (9) shall not apply to an oil tanker which is engaged exclusively on voyages of 72 hours or less in duration and within 50 nautical miles of the nearest land, provided that-

(i) the oil tanker is engaged exclusively in trade between ports or terminals within the Islands;
(ii) the oil tanker retains on board all oily-mixtures for subsequent discharge to reception facilities; and

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(iii) the Director has determined that adequate facilities are available to receive such oily mixtures; and

(b) paragraphs (6) to (9) shall not apply to an oil tanker where-

(i) the tanker is an existing oil tanker of 40,000 deadweight tons or above, engaged in specific trades, in accordance with regulation 11(1) and complying with the conditions specified in regulation 11(2); or

(ii) subject to paragraph 12, the tanker is engaged exclusively on voyages-
(A) within special areas; or
(B) within 50 nautical miles from the nearest land outside special areas and-
(AA) trading between ports and terminals within the Islands; or
(BB) on restricted voyages of 72 hours or less in duration.

(12) Tankers to which paragraph (11)(b)(ii) applies shall comply with the following requirements-

(a) all oily mixtures are retained on board for subsequent discharge to reception facilities;
(b) for voyages specified in paragraph (11)(b)(ii)(B) adequate reception facilities are available to receive such oily mixtures in those oil loading ports or terminals at which the tanker calls;
(c) the IOPP Certificate is endorsed to the effect that the ship is exclusively engaged in one or more of the categories of voyages specified in paragraph (11)(b)(ii)(A) and (B); and
(d) the relevant entries are recorded in the Oil Record Book.

(13) Paragraphs (1), (2) and (3) shall not apply to oil tankers carrying asphalt or other products subject to these Regulations which, through their physical properties, inhibit effective product/water separation and monitoring; in such cases the requirements of section 54 (1), (2) and (4) of the Law shall be satisfied by the retention of residues on board and the discharge of all contaminated washings to reception facilities.

PART III - Requirements for the Segregation of Cargo

Interpretation of Part III

6. (1) Notwithstanding regulation 2(1), for the purposes of this Part a "new oil tanker" means an oil tanker-

(a) for which the building contract was placed after 1st June 1979;
(b) in the absence of a building contract, the keel of which was laid, or which was at a similar stage of construction after 1st January 1980;
(c) the delivery of which was after 1st June 1982; or
(d) which has undergone a major conversion-
(i) for which the contract was placed after 1st June 1979;
(ii) in the absence of a contract, the construction work of which was begun after 1st January 1980; or
(iii) which was completed after 1st June 1982, except that, for oil tankers of 70,000 tons deadweight and above, the definitions in regulation 2(1) shall apply for the purposes of regulation 7(l).

(2) For the purposes of regulations 7, 10, 11, 12, 15(5) and 15(6) an "existing oil tanker" means an oil tanker which is not a new oil tanker as defined in paragraph (1).

Provision of segregated and dedicated clean ballast tanks and related requirements

7. (1) Every new crude oil tanker of 20,000 tons deadweight and above and every new product carrier of 30,000 tons deadweight and above shall be provided with segregated ballast tanks and shall comply with paragraphs (2), (3), (4) and (5), where appropriate.

(2) The capacity of the segregated ballast tanks shall be such that the ship can operate safely on ballast voyages without recourse to the use of cargo tanks for water ballast except as provided for in paragraphs (3) or (4) and the capacity of the segregated ballast tanks shall be at least such that, in any ballast condition at any part of the voyage,

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including the condition consisting of lightweight plus segregated ballast only, the ship's draughts and trim can meet each of the following requirements:

(a) the moulded draught amidships (dm) in metres (without taking into account a ship's deformation) shall not be less than 2.0 + 0.02L;
(b) the draughts at the forward and after perpendiculars shall correspond to those determined by the draught amidships (dm) as specified in subparagraph (a), in association with the trim by the stern of not greater than 0.015L; and
(c) in any case the draught at the after perpendicular shall not be less than that which is necessary to obtain full immersion of the propeller.

(3) In no case shall ballast water be carried in cargo tanks, except-

(a) on those voyages when weather conditions are so severe that, in the opinion of the master, it is necessary to carry additional ballast water in cargo tanks for the safety of the ship; or
(b) where the particular character of the operation of an oil tanker renders it necessary to carry ballast water in excess of the quantity which may be carried in segregated ballast tanks under paragraph (2), provided that the Director has approved that method of operation,

and such additional ballast water shall be processed and discharged in accordance with the requirements of sections 54(1), (2) and (4) of the Law and regulation 5 and an entry of the discharge shall be made in the Oil Record Book.

(4) In the case of new crude oil tankers, the additional ballast permitted by paragraph (3) shall be carried only in cargo tanks that have been crude oil washed in accordance with regulation 10 before departure from an oil unloading port or terminal.

(5) Notwithstanding paragraph (2), the capacity of the segregated ballast tanks for new oil tankers less than 150 metres in length shall be as determined by the Director.

(6) Every new crude oil tanker of 20,000 tons deadweight and above shall be fitted with a cargo tank cleaning system using crude oil washing which shall fully comply with the requirements of regulation 10 within one year after the tanker is first engaged in the trade of carrying crude oil or by the end of the third voyage carrying crude oil suitable for crude oil washing, whichever occurs later, and, unless an oil tanker carries crude oil which is not suitable for crude oil washing, it shall operate the system in accordance with regulation 10.

(7) Subject to paragraphs (8) and (9) and to regulations 11 and 12, every existing crude oil tanker of 40,000 tons deadweight and above shall be provided with segregated ballast tanks and shall comply with the requirements of paragraphs (2) and (3).

(8) Subject to regulations 11 and 12, existing crude oil tankers of 40,000 tons deadweight and above may, in lieu of being provided with segregated ballast tanks, operate with a cargo tank cleaning procedure using crude oil washing in accordance with regulation 10 unless the crude oil tanker is intended to carry crude oil which is not suitable for crude oil washing.

(9) Subject to regulation 11, every existing product carrier of 40,000 tons deadweight and above shall be provided with segregated ballast tanks and shall comply with the requirements of paragraphs (2) and (3) or, alternatively, operate with dedicated clean ballast tanks in accordance with regulation 9.

(10) An oil tanker which is not required to be provided with segregated ballast tanks in accordance with paragraphs (1), (7) or (9) may be described in the IOPP Certificate as a segregated ballast tanker where it complies with the requirements of paragraphs (2) and (3), or paragraph (5), where appropriate.

Protective location of segregated ballast spaces

8. In every new crude oil tanker of 20,000 tons deadweight and above and every new product carrier of 30,000 tons deadweight and above, the segregated ballast tanks required to provide the capacity to comply with regulation 7 which are located within the cargo tank

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First Schedule

length shall be arranged, in accordance with the requirements of the First Schedule to provide a measure of protection against oil outflow in the event of grounding or collision.

Requirements for oil tankers with dedicated clean ballast tanks

9. (1) An oil tanker operating with dedicated clean ballast tanks in accordance with regulation 7(9) shall have adequate tank capacity, dedicated solely to the carriage of clean ballast to meet the requirements of regulations 7(2) and (3) as those provisions apply to segregated ballast tanks.

(2) The arrangements and operational procedures for dedicated clean ballast tanks shall comply with the requirements of Specifications for Oil Tankers with Dedicated Clean Ballast Tanks.

(3) An oil tanker operating with dedicated clean ballast tanks shall be equipped with an oil content meter approved in accordance with the specification for such equipment set out in the Recommendations on International Performance and Test Specifications for Oily Water Separating Equipment and Oil Content Meters so as to permit supervision of the oil content in the ballast water being discharged.

(4) Every oil tanker operating with dedicated clean ballast tanks shall be provided with a dedicated Clean Ballast Tank Operation Manual detailing the system and specifying operational procedures, which shall be approved by the Director and shall contain all the information set out in the Specifications referred to in paragraph (2).

(5) Where an alteration affecting the dedicated clean ballast tank system is made, the Operation Manual shall be revised, and the revision approved by the Director.

Requirements for crude oil washing

10. (1) Every crude oil washing system required to be provided in accordance with regulation 7(6) and (8) shall comply with the requirements of this regulation.

(2) The crude oil washing installation and associated equipment and arrangements (including qualification of personnel) shall comply with the requirements and specifications set out in Specifications for the Design, Operation and Control of Crude Oil Washing Systems.

(3) With respect to the ballasting of cargo tanks, sufficient cargo tanks shall be crude oil washed prior to each ballast voyage to ensure that, taking into account the tanker's trading pattern and expected weather conditions, ballast water will be put only into cargo tanks which have been crude oil washed.

(4) Every oil tanker operating with a crude oil washing system shall be provided with an Operations and Equipment Manual describing the system and equipment in detail and specifying the operational procedures to be followed and the Manual shall be approved by the Director and shall contain all the information set out in the Specifications referred to in paragraph (2).

(5) Where any alteration is made affecting the crude oil washing system the Operations and Equipment Manual shall be revised, and the revision approved by the Director.

Existing oil tankers engaged in specific trades

11. (1) Subject to paragraph (2), regulation 7(7), (8) and (9) shall not apply to an existing oil tanker engaged solely in specific trades between-

(a) ports or terminals within a MARPOL member State; or
(b) ports or terminals located in two or more MARPOL member States, where-
  (i) the voyage is entirely within a special area; or
  (ii) the voyage is entirely within other limits designated by the Director.

(2) Paragraph (1) shall apply only when the ports or terminals where the cargo is loaded on such voyages are provided with reception facilities adequate for the reception and treatment of all the ballast and tank washing water from oil tankers using them and all the following conditions are complied with:

(a) subject to the exceptions provided for in section 64 of the Law, all ballast water, including clean ballast water, and tank washing residues shall be retained on board

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until they are transferred to the said reception facilities, and the entry relating to the transfer in the Oil Record Book shall be endorsed by a competent authority appointed by the MARPOL member State;
(b) agreement has been reached between the Director and the Governments of the MARPOL member State or States referred to in subparagraph (a) or (b) of paragraph (1) on the use of an existing oil tanker for such a trade;
(c) the adequacy of reception facilities (in accordance with Regulations relating to reception facilities) at the ports or terminals referred to in this regulation, shall be approved by the governments of the MARPOL member States within which those ports or terminals are situated; and
(d) the IOPP Certificate has been endorsed to the effect that the oil tanker is solely engaged in such specific trade.

Existing oil tankers having special ballast arrangements

12. (1) Where an existing oil tanker of 40,000 deadweight tons and above is so constructed or operates in such a manner that it complies at all times with the draught and trim requirements set out in regulation 7(2) without recourse to the use of ballast water, it shall be deemed to comply with the segregated ballast tank requirements referred to in regulation 7(7), provided that all the following conditions are complied with:

(a) the operational procedures and ballast arrangements have been approved;
(b) when the draught and trim requirements are achieved through an operational procedure, agreement as to the use of that procedure has been reached between the Director and the Governments of the MARPOL member States concerned; and
(c) the IOPP Certificate has been endorsed to the effect that the oil tanker is operating with special ballast arrangements.

(2) In no case shall ballast be carried in cargo oil tanks except on those voyages when weather conditions are so severe that, in the opinion of the master, it is necessary to carry additional ballast water in cargo tanks for the safety of the ship.

(3) The additional ballast water referred to in paragraph (2) shall be discharged in compliance with section 54(1), (2) and (4) of the Law and regulation 5 and the discharge of such water shall be entered in the Oil Record Book.

Segregation of oil and water ballast and prohibition on carriage of oil in forepeak tanks

13. (1) Except as provided in paragraph (2), in new ships of 4,000 gross tonnage and above other than oil tankers, and in new oil tankers of 150 gross tonnage and above, no ballast water shall be carried in an oil fuel tank.

(2) Where abnormal conditions or the need to carry large quantities of oil fuel render it necessary for ships referred to in paragraph (1) to carry ballast water which is not clean ballast water in an oil fuel tank, such ballast water shall be discharged to reception facilities or into the sea in compliance with section 54(3) of the Law using the equipment specified in regulation 4(2), and the discharge shall be entered in the Oil Record Book.

(3) All other ships shall comply with the requirements of paragraph (1) so far as it is reasonable and practicable to do so.

(4) In a ship of 400 gross tonnage and above for which the building contract is placed after 1st January 1982 or, in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction after 1st July 1982, oil shall not be carried in a forepeak tank or a tank forward of the collision bulkhead.

(5) Ships which are not subject to paragraph (4) shall comply with that paragraph, so far as it is reasonable and practicable to do so.

Tanks for oil residue (sludge)

14. Every ship to which section 63 of the Law applies shall be provided with piping to enable residues from machinery spaces and machinery space bilges to be pumped to a reception facility and such piping shall be led to the open deck and there fitted with a flange in accordance with dimensions given in the Second Schedule.

Second Schedule

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Pumping, piping and discharge arrangemen for dirty ballast water oil tankers

15. (1) In every oil tanker, a discharge manifold for the discharge of dirty ballast water or oil contaminated water to reception facilities shall be located on the open deck on both sides of the ship.

(2) In every oil tanker, pipe lines for the discharge into the sea of ballast or oil contaminated water from cargo tank areas which may be permitted under sections 54 and 57 to 62 inclusive of the Law shall be led to the open deck or to the ship's side above the waterline in the deepest ballast condition, or, subject to the approval of the Director, below the waterline-

(a) to enable such discharges below the waterline as are permitted by paragraph (6) to be made; and
(b) where the discharge outlet is located above the departure ballast waterline but not above the waterline in the deepest ballast condition, if so located before 1st January 1981.

(3) In new oil tankers, means shall be provided for stopping the discharge into the sea of ballast water or oil contaminated water from cargo tank areas, other than those discharges below the waterline permitted under paragraph (6), from a position on the upper deck or above, and so located that the manifold referred to in paragraph (1) and the discharge into the sea from the pipe lines referred to in paragraph (2) may be visually observed, provided that the means for stopping the discharge may be situated elsewhere than at the observation position where an effective communication system, such as a telephone or radio system, is provided between the observation position and the discharge control position.

(4) Every new oil tanker required to be provided with segregated ballast tanks or fitted with a crude oil washing system shall comply with the following requirements-

(a) it shall be equipped with oil piping so designed and installed that oil retention in the lines is minimised; and
(b) means shall be provided to drain all cargo pumps and all oil lines at the completion of cargo discharge where necessary by connection to a stripping device, so designed that the line and pump drainings shall be capable of being discharged both ashore and to a cargo tank or a slop tank; and for discharge ashore a special small diameter line shall be provided and connected outboard of the deck manifold valves, both port and starboard.

(5) Every existing crude oil tanker required to be provided with segregated ballast tanks, or to be fitted with a crude oil washing system, or to operate with dedicated clean ballast tanks shall comply with paragraph (4)(b).

(6) Ballast water or oil contaminated water from the cargo tank areas of an oil tanker shall be discharged only above the waterline, except that-

(a) segregated ballast and clean ballast may be discharged below the waterline-
  (i) in ports or at offshore terminals; or
  (ii) at sea by gravity,

provided that the surface of the ballast water has been examined immediately before the discharge to ensure that no contamination with oil has taken place;

(b) existing oil tankers which, without modification, are not capable of discharging segregated ballast above the waterline may discharge segregated ballast below the waterline at sea, provided that the surface of the ballast water has been examined immediately before the discharge to ensure that no contamination with oil has taken place;
(c) existing oil tankers operating with dedicated clean ballast tanks which without modification are not capable of discharging ballast water from the dedicated clean ballast tanks above the waterline, may discharge this ballast below the waterline provided that the discharge of the ballast water is supervised with the aid of an oil content meter as provided for in regulation 9(3);

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(d) dirty ballast water or oil contaminated water from tanks in the cargo area of an oil tanker at sea, other than slop tanks, may be discharged by gravity below the waterline, provided that sufficient time has elapsed in order to allow oil/water separation to have taken place and the ballast water has been examined immediately before the discharge with an oil/water interface detector of the kind referred to in regulation 5(8), in order to ensure that the height of the interface is such that the discharge does not involve any increased harm to the marine environment; and

(e) dirty ballast water or oil contaminated water from cargo tank areas of an existing oil tanker may be discharged below the waterline, subsequent to or in lieu of discharge by the method referred to in subparagraph (d), provided that-

(i) a part of the flow of such water is led through permanent piping to a readily accessible location on the upper deck or above where it may be visually observed during the discharge operation; and

Third Schedule

(ii) such part flow arrangements comply with the requirements set out in the Third Schedule.

PART IV - Requirements for Minimising Oil Pollution from Oil Tankers due to Side and Bottom Damage

Interpretation

Fourth Schedule

16. For the purposes of determining the permissible size and arrangements of cargo tanks and for assessing the standard of subdivision of oil tankers the meaning of "side and bottom damage" and "hypothetical outflow of oil" are set out in the Fourth Schedule.

Limitation of size and arrangement of cargo tanks

17. (1) Every new oil tanker shall comply with this regulation and every existing oil tanker shall comply with this regulation where-

(a) it was delivered to its first owner after 1st January 1977; or

(b) it was delivered to its first owner on or before-

(i) 1st January 1977; and

(ii) the building contract for the tanker was placed after 1st January 1974, or in cases where there was no building contract the keel was laid or the tanker was at a similar stage of construction after 30th June 1974.

Fourth Schedule

(2) Cargo tanks of oil tankers shall be of such size and arrangement that the hypothetical outflow O_c, or O_s, calculated in accordance with the Fourth Schedule, anywhere in the length of the ship does not exceed 30,000 cubic metres or 400 $\sqrt[3]{DW}$, whichever is the greater, but subject to a maximum of 40,000 cubic metres.

(3) The volume of a one wing cargo oil tank of an oil tanker shall not exceed 75 percent of the limits of the hypothetical outflow O_c , or O_s referred to in paragraph (2) and the volume of any one centre cargo oil tank shall not exceed 50,000 cubic metres, provided that in segregated ballast oil tankers as defined in regulation 7, the permitted volume of a wing cargo oil tank situated between two segregated ballast tanks, each exceeding l_c in length may be increased to the maximum limit of hypothetical oil outflow provided that the width of the wing tanks exceeds t_c where t_c is as defined in the Fourth Schedule.

(4) The length of each cargo tank shall not exceed 10 metres or one of the following values, whichever is the greater-

(a) where no longitudinal bulkhead is provided inside the cargo tanks, the lesser of-

(i) $\left(0.5\frac{b_i}{B} \pm 0.1\right)L$; and

(ii) 0.2 L;

(b) where a centreline longitudinal bulkhead is provided inside the cargo tanks-

$\left(0.25\frac{b_i}{B} \pm 0.15\right)L$; or

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(c) where two or more longitudinal bulkheads are provided inside the cargo tanks-
(i) for wing cargo tanks, 0.2*L*; or
(ii) for centre cargo tanks-

(A) if $\frac{b_i}{B}$ is equal to or greater than one fifth- 0.2*L*; or

(B) if $\frac{b_i}{B}$ is less than one fifth –

(AA) where no centreline longitudinal bulkhead is provided –

$\left(0.5\frac{b_i}{B} \pm 0.1\right)L$; or

(BB) where a centreline longitudinal bulkhead is provided –

$\left(0.25\frac{b_i}{B} \pm 0.15\right)L$

and in this paragraph "b_i" is the minimum distance from the ship's side to the outer longitudinal bulkhead of the tank in question measured inboard at right angles to the centreline at the level corresponding to the assigned summer freeboard.

(5) In order not to exceed the volume limits established by paragraphs (2), (3) and (4) and irrespective of the type of cargo transfer system installed, when such a system inter-connects two or more cargo tanks, valves or other similar closing devices shall be provided for separating the tanks from each other and these valves or devices shall be closed when the tanker is at sea.

(6) Lines of piping which run through cargo tanks in a position less than t_c from the ship's side or less than v_s from the ships bottom, where v_s is as defined in the Fourth Schedule, shall be fitted with valves or similar closing devices at the point at which they open into a cargo tank and these valves shall be kept closed at sea at any time when the tanks contain cargo oil, except that they may be opened for cargo transfer needed for the purpose of trimming of the ship.

Subdivision and stability
Fifth Schedule

18. (1) Every new oil tanker shall comply with the subdivision and damage stability criteria specified in the Fifth Schedule.

(2) The master of every new oil tanker and the person in charge of a new non-self propelled oil tanker to which these Regulations apply shall be supplied by the owner with-

(a) information relating to loading and distribution of cargo necessary to ensure compliance with this regulation; and
(b)data on the ability of the ship to comply with the damage stability criteria prescribed by this regulation, including the effect of any lesser requirements that may have been imposed by the Director,

and such information and data shall be supplied in an approved form.

(3) Every oil tanker of 5,000 tons deadweight and above-

(a) for which the building contract was placed on or after 1st February 1999;
(b) in the absence of a building contract, the keel of which was laid, or which was at a similar stage of construction, on or after 1st August 1999;
(c) the delivery of which was on or after 1st February 2002; or
(d) which has undergone a major conversion:
(i) for which the contract was placed after 1st February, 1999;
(ii) in the absence of a contract, the construction work of which was begun after 1st August 1999; or
(iii) which was completed after 1st February 2002,

shall comply with the intact stability criteria specified in Part B of the Fifth Schedule.

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PART V - Improved Requirements for the Design and Construction of Oil Tankers Against Oil Pollution in the Event of Collision or Stranding

New oil tankers (building contracts on after 6th July 1993)

19. (1) This regulation applies to oil tankers of 600 tons deadweight and above-

(a) for which the building contract is placed on or after 6th July 1993;
(b) in the absence of a building contract, the keel of which was laid or which is at a similar stage of construction on or after 6th January 1994;
(c) the delivery of which was on or after 6th July 1996; or
(d) which has undergone a major conversion-
(i) for which the contract was placed after 6th July 1993;
(ii) in the absence of a contract, the construction work of which was begun after 6th January 1994; or
(iii) which was completed after 6th July 1996.

(2) Subject to paragraphs (4) and (5), every oil tanker of 5,000 tons deadweight and above shall comply with the requirements of paragraph (3), and an oil tanker in respect of which regulation 8 makes provision shall comply with the requirements of paragraph (3) instead of the requirements of that regulation.

Sixth Schedule

(3) The entire cargo tank length shall be protected by ballast tanks or spaces other than cargo and fuel oil tanks, in accordance with the requirements set out in the Sixth Schedule.

Seventh Schedule

(4) Double bottom tanks or spaces as required by paragraph (3) may be dispensed with, where the design of the tanker meets the conditions set out in the Seventh Schedule.

(5) Instead of complying with the requirements of paragraphs (3) or (4), an oil tanker referred to in paragraph (2) may conform to other methods of design and construction, provided that such methods-

(a) ensure at least the same level of protection against oil pollution in the event of collision or stranding; and
(b) have the approval of the Director based on guidelines developed by the Organization.

(6) In an oil tanker to which this regulation applies, oil shall not be carried in a space extending forward of a collision bulkhead and an oil tanker which is not required to have a collision bulkhead shall not carry oil in a space extending forward of the transverse plane perpendicular to the centreline that is located as if it were a collision bulkhead.

(7) In approving the design and construction of an oil tanker to which this regulation applies, the Certifying Authority shall have due regard to general safety considerations, including the need for the maintenance and inspections of wing and double bottom tanks or spaces.

Existing oil tankers (building contracts before 6th July 1993)

20. (1) Subject to paragraphs (2) and (3), this regulation applies to every crude oil tanker of 20,000 tons deadweight and above and to every product carrier of 30,000 tons deadweight and above-

(a) for which the building contract was placed before 6th July 1993;
(b) in the absence of a building contract, the keel of which was laid or which was at a similar stage of construction before 6th January 1994; or
(c) the delivery of which was before 6th July 1996.

(2) This regulation does not apply, or, having applied, shall cease to apply, .to a crude oil tanker or product carrier which has undergone a major conversion-

(a) for which the contract was placed after 6th July 1993;
(b) in the absence of a contract, the keel of which was laid or which was at a similar stage of construction before 6th January 1994; or
(c) which was completed after 6th July 1996.

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(3) This regulation does not apply, or, having applied, shall cease to apply, to an oil tanker which, although not required to comply with or conform to regulation 19, does in fact comply with or conform to-

Sixth Schedule
Seventh Schedule

(a) the requirements of the Sixth Schedule; or
(b) those requirements as modified in accordance with the Seventh Schedule; or
(c) other methods of design and construction which satisfy the requirements of regulation 19(5),

(4) For the purposes of this regulation, an oil tanker which does not meet in all respects the requirements mentioned in paragraph (3) as regards minimum distances between the cargo tank boundaries and the ship side and bottom plating shall be treated as meeting those requirements where-

(a) the side protection distance is not less than that which the IBC Code specifies for Type 2 cargo tank location (that is to say, the said distance is nowhere less than 760 mm from the shell plating); and
(b) the bottom protection distance is not less than the lesser of B/15 and 2 metres.

(5) (a) An oil tanker to which this regulation applies-

(i) where it is a Cayman Islands ship, shall be subject to an enhanced programme of inspections during renewal, annual, and intermediate surveys conducted pursuant to sections 41 and 42 of the Law; or
(ii) where it is not a Cayman Islands ship, shall have undergone periodical, intermediate and annual surveys as provided for by MARPOL,

and the scope of such surveys shall at least comply (where the tanker is a Cayman Islands ship) or have complied (where the tanker is not a Cayman Islands ship) with guidelines developed by the Organization pursuant to regulation 13G(3)(a) of Annex I to MARPOL;

(b) An oil tanker to which this regulation applies and which is over five years of age shall carry on board a complete file containing the reports or copies of the reports on surveys of the ship carried out pursuant to-

(i) the requirements of these Regulations (where the tanker is a Cayman Islands ship); or
(ii) the requirements of MARPOL (where the tanker is not a Cayman Islands ship),

and the file shall contain the results of all scantling measurement required and a statement of all structural work carried out and shall be available for inspection-

(A) where the tanker is a Cayman Islands ship, by the Certifying Authority, or by the competent authority of the Government of a MARPOL member State (other than the Cayman Islands); or
(B) where the tanker is not a Cayman Islands ship, by a Certifying Authority;

(c) The file shall be accompanied by a condition evaluation report containing conclusions on the structural condition of the ship and its residual scantlings, and endorsed to indicate that it is considered satisfactory-

(i) where the tanker is a Cayman Islands ship, by the Certifying Authority; or
(ii) where the tanker is not a Cayman Islands ship, by or on behalf of the Government of the State whose flag the ship is entitled to fly; and

(d) The file and condition evaluation reports shall be prepared in a standard format in accordance with guidelines developed by the Organization pursuant to the said regulation 13G(3)(a) of Annex I to MARPOL.

(6) (a) Subject to subparagraph (b), an oil tanker which is not a new oil tanker as defined in regulation 6(l); and to which this regulation still applies immediately before the expiration of 25 years from the date on which it was delivered, shall on the expiration of that period become subject to regulation 19(5), (6) and (7), and to the Sixth and Seventh Schedules, and this regulation shall cease to apply to it.

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(b) A tanker referred to in subparagraph (a) shall not become subject to the provisions referred to in that subparagraph (and this regulation shall not cease to apply to it) until the expiration of 30 years from the date on which it is delivered if on the expiration of 25 years from that date wing tanks or double bottom spaces, not used for the carriage of oil and meeting the width and height requirements of paragraph 3 of the First Schedule, cover-

(i) at least 30% of L_t, for the full depth of the ship on each side; or

(ii) at least 30% of the projected bottom shell area within the length L_t; where L_t, is as defined in paragraph 1 of the First Schedule.

First Schedule

(7) An oil tanker which is a new oil tanker as defined in regulation 6(1); and to which this regulation applies immediately before the expiration of 30 years from the date on which it was delivered, shall, on the expiration of that period, become subject to regulation 19(5), (6) and (7), and to the Sixth and Seventh Schedules and this regulation shall cease to apply to it.

(8) New ballast and load conditions resulting from the application of paragraph (5) shall, where the oil tanker is a Cayman Islands ship, be subject to the approval of the Certifying Authority, and the Certifying Authority shall have particular regard to the longitudinal and local strength, intact stability and, where applicable, damage stability.

(9) Other structural or operational arrangements may be accepted as alternatives to the requirements of paragraph (5) where the alternative arrangements ensure at least the same level of protection against oil pollution in the event of collision or stranding and have the approval of the Director (in the case of a Cayman Islands ship) or of the Government of the State whose flag the ship is entitled to fly (in the case of a ship other than a Cayman Islands ship) based on guidelines developed by the Organization pursuant to regulation 13G(7) of Annex I to MARPOL.

PART VI – Prevention of Pollution Arising from an Oil Pollution Incident

Shipboard oil pollution emergency plan

21. The shipboard oil pollution emergency plan referred to in section 71 of the Law shall be in accordance with the guidelines for the development of shipboard oil pollution emergency plans adopted by the Marine Environment Protection Committee of the Organization on 6th March 1992 by Resolution MEPC 54 (32) and includes any document amending it which is considered by the Member of Cabinet to be relevant from time to time; and the plan shall include at least-

(a) the procedure to be followed by the master or other persons having charge of the ship to report an oil pollution incident as required by the Merchant Shipping (Marine Pollution) (Reporting of Incidents Involving Harmful Substances) Regulations 2004;
(b) the list of persons, including local authorities, to be contacted in the event of an oil pollution incident;
(c) a detailed description of the action to be taken immediately by persons on board to reduce or control the discharge of oil following an incident; and
(d) the procedures and point of contact on the ship for co-ordinating shipboard action with local authorities in combating the pollution.

PART VII – Intact Stability of Oil Tankers of 5,000 Tons Deadweight and above

Intact stability for oil tankers of 5,000 tons deadweight and above

22. (1) This regulation shall apply to every oil tanker of 5,000 tons deadweight and above:

(a) for which the building contract was placed on or after 1st February 1999; (b) in the absence of a building contract, the keel of which was laid, or which was at a similar stage of construction, on or after 1st August 1999;
(c) the delivery of which was on or after 1st February 2002; or
(d) which has undergone a major conversion:

(i) for which the contract was placed after 1st February, 1999;

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(ii) in the absence of a contract, the construction work of which was begun after 1st August 1999; or

(iii) which was completed after 1st February 2002.

Ninth Schedule

(2) Every oil tanker to which this regulation applies shall comply with the intact stability criteria specified in the Ninth Schedule.

PART VIII-Repeal

Repeal

23. The Merchant Shipping (Prevention of Oil Pollution) (Cayman Islands) Regulations, 1988 are repealed.

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FIRST SCHEDULE

Regulations 8 & 20

PROTECTIVE LOCATION OF BALLAST SPACES

1. In every new crude oil tanker of 20,000 tons deadweight and above, and every new product carrier of 30,000 tons deadweight and above the segregated ballast tanks and spaces other than oil tanks within the cargo tank length (Lt) shall be so arranged as to comply with the following requirement-

$$\sum PA_c + \sum PA_s \geq J[L_t(B + 2D)]$$

where -

PA_c = the side shell area in square metres for each segregated ballast tank or space other than oil tank based on projected moulded dimensions;

PA_s = the bottom shell area in square metres for each such tank or space based on projected moulded dimensions;

L_t = the length in metres between the forward and after extremities of the cargo tanks;

B = the maximum breadth of the ship in metres as defined;

D = the maximum moulded depth in metres measured vertically from the top of the keel to the top of the freeboard deck beam at the side at amidships and in ships having rounded gunwales, the moulded depth shall be measured to the point of intersection of the moulded lines of the deck and side shell plating, the lines extending as though the gunwale were of angular design; and

J = 0.45 for oil tankers of 20,000 tons deadweight and 0.30 for oil tankers of 20,000 tons deadweight and above, subject to paragraph (2). For intermediate values of the deadweight the value of *"J"* shall be determined by linear interpolation.

2. For tankers of 200,000 tons deadweight and above the value of "J" may be reduced as follows-

$$J_{reduced} = \left[J - \left(a - \frac{O_c + O_s}{4 \times O_A} \right) \right]$$

or 0. 2 whichever is greater, where -

a = 0.25 for oil tankers of 200,000 tons deadweight;

a = 0.40 for oil tankers of 300,000 tons deadweight; and

a = 0.50 for oil tankers of 420,000 tons deadweight and above;

(For intermediate values of deadweight the value of "a" shall be determined by linear interpolation.)

O_c = has the same meaning as in the Fourth Schedule;

O_s = has the same meaning as in the Fourth Schedule; and

O_A = the allowable oil outflow as required by regulation 17.

3. In calculating the value of "PA_c" and "PA_s" for segregated ballast tanks and spaces other than oil tanks -

(a) where the width of a wing tank or space which extends for the full depth of the ship's side or from the deck to the top of the double bottom is less than 2 metres measured inboard from the ship's side at right angles to the centre line, that wing tank or space shall not be taken into account when calculating the protecting area " PA_c "; and

(b) where the depth of a double bottom tank or space is less than $\frac{B}{15}$ or 2 metres, that double bottom tank or space shall not be taken into account when calculating the protecting area " Pa_s".

4. The width and depth of wing tanks and double bottom tanks shall be measured clear of the bilge area and, in the case of width, shall be measured clear of any rounded gunwale area.

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SECOND SCHEDULE

Regulation 14

OIL RESIDUES

STANDARD DIMENSIONS OF FLANGES FOR DISCHARGE CONNECTIONS

Every ship shall be provided with piping to enable residues from machinery spaces and machinery space bilges to be pumped to a reception facility. This piping is to be led to the open deck and fitted there with a flange of the following dimensions –

Description	**Dimension**
Outside diameter	215 mm
Inner diameter	According to pipe outside diameter
Bolt circle diameter	183 mm
Slots in flange	6 holes, 22 mm in diameter, equidistantly placed on a bolt circle of 183 mm diameter, slotted to the flange periphery, the slot width to be 22 mm
Flange thickness	20 mm
Bolts and nuts quantity, diameter	6 each of 20 mm in diameter and of suitable length

The flange shall be designed to accept pipes up to a maximum diameter of 125 mm and shall be of steel or other equivalent material having a flat face. This flange, together with a gasket of oil proof material, shall be suitable for a service pressure of 6 kg/cm2.

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THIRD SCHEDULE

Regulation 15

SPECIFICATIONS FOR THE DESIGN, INSTALLATION AND OPERATION OF A PART-FLOW SYSTEM FOR CONTROL OF OVERBOARD DISCHARGES

Purpose

1. The purpose of these Specifications is to provide specific design criteria and installation and operational requirements for the part-flow system referred to in regulation 15(6)(e).

Application

2. (1) Existing oil tankers may discharge dirty ballast water and oil contaminated water from cargo tank areas below the waterline, provided that part of the flow is led through permanent piping to a readily accessible location on the upper deck or above where it may be visually observed during the discharge operation and provided that the arrangements comply with the requirements of this Schedule.

(2) The part-flow concept is based on the principle that the observation of a representative part of the overboard effluent is equivalent to observing the entire effluent stream and these specifications provide the details of the design installation, and operation of a part-flow system.

General Provisions

3. (1) The part-flow system shall be so fitted that it can effectively provide a representative sample of the overboard effluent for visual display under all normal operating conditions.

(2) The part-flow system is in many respects similar to the sampling system for an oil discharge monitoring and control system but shall have pumping and piping arrangements separate from such a system, provided that other combined equivalent arrangements may be acceptable.

(3) The display of the part-flow shall be arranged in a sheltered and readily accessible location on the upper deck or above, (e.g. the entrance to the pump room) and shall be effective communication between the location of the part-flow display and the discharge control position.

(4) Samples shall be taken from relevant sections of the overboard discharge piping and be passed to the display arrangement through a permanent piping system.

(5) The part-flow system shall include the following components -

(a) sampling probes;
(b) sample water piping system;
(c) sample feed pump(s);
(d) display arrangement;
(e) sample discharge arrangement; and, subject to the diameter of the sample piping-
(f) flushing arrangement.

(6) The part-flow system shall comply with the appropriate safety requirements.

System Arrangement

4. (1) Sampling points location

(a) sampling points shall be so located that relevant samples can be obtained from the effluent being discharged through outlets below the waterline which are used for operational discharges;
(b) sampling points shall, as far as practicable, be located in pipe sections where a turbulent flow is not normally encountered; and
(c) sampling points shall, as far as practicable, be arranged in accessible locations in vertical sections of the discharge piping.

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(2) Sampling probes

(a) sampling probes shall be arranged to protrude into the pipe a distance of about one forth of the pipe diameter;
(b) sampling probes shall be arranged for easy withdrawal for cleaning;
(c) a stop valve shall be fitted adjacent to each probe, except that where the probe is mounted in a cargo line, two stop valves shall be fitted in series, in the sample line;
(d) sampling probes shall be of corrosion-resistant and oil-resistant material, of adequate strength, properly jointed and supported;
(e) sampling probes shall have a shape, such as shown in Figure 1, that is not prone to becoming clogged by particle contaminants and shall not generate high hydrodynamic pressures at the sampling probe tip; and
(f) sampling probes shall have the same nominal bore as the sample piping.

(3) Sample piping

(a) the sample piping shall be arranged as straight as possible between the sampling points and the display arrangement and bends and pockets where settled oil or sediment may accumulate shall be avoided;
(b) the sample piping shall be so arranged that sample water is conveyed to the display arrangement within 20 seconds and flow velocity in the piping shall not be less than 2 metres per second;
(c) the diameter of the piping shall not be less than 40 millimetres where no fixed flushing arrangement is provided and shall not be less than 25 millimetres where a pressurised flushing arrangement as detailed in subparagraph (4) is installed;
(d) the sample piping shall be of corrosion-resistant and oil-resistant material, of adequate strength, properly jointed and supported; and
(e) where several sampling points are installed the piping shall be connected to a valve chest at the suction side of the sample feed pump.

(4) Sample feed pump

the sample feed pump capacity shall be suitable to allow the flow rate of the sample water to comply with subparagraph (2)(b).

(5) Flushing arrangement

where the diameter of sample piping is less than 40 millimetres, a fixed connection from pressurised sea or fresh water piping system shall be installed to enable flushing of the sample piping system.

(6) Display arrangement

(a) the display arrangement shall consist of a display chamber provided with a sight glass and the chamber shall be of a size that will allow a free fall stream of the sample water to be clearly visible over a length of at least 200 millimetres or such equivalent arrangement as may be approved;
(b) the display arrangement shall incorporate valves and piping in order to allow part of the sample water to bypass the display chamber to obtain a laminar flow for display in the chamber; (c) the display arrangement shall be designed to be easily opened and cleaned;
(d) the internal surfaces of the display chamber shall be white except for the background wall which shall be so coloured as to facilitate the observation of a change in the quality of the sample water;
(e) the lower part of the display chamber shall be shaped as a funnel for collection of the sample water;
(f) a test cock for taking a grab sample shall be provided in order that a sample of the water can be examined independently of that in the display chamber; and
(g) the display arrangement shall be adequately lighted to facilitate visual observation of the sample water.

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(7) With respect to the sample arrangement, the sample water leaving the display chamber shall be routed into the sea or to a slop tank through fixed piping of adequate diameter.

Operation

5. (1) When a discharge of dirty ballast water or other oil contaminated water from the cargo tank area is taking place through an outlet below the waterline, the part-flow system shall provide sample water from the relevant discharge outlet at all times.

(2) The sample water shall be observed particularly during those phases of the discharge operation when the greatest possibility of oil contamination occurs and the discharge shall be stopped whenever traces of oil are visible in the flow and when the oil content meter reading indicates that the oil content exceeds permissible limits.

(3) On those systems that are fitted with flushing arrangements, the sample piping shall be flushed after contamination has been observed and the sample piping shall be flushed after each period of usage.

(4) The ship's cargo and ballast handling manuals and, where applicable, those manuals required for crude oil washing systems or dedicated clean ballast tanks operation shall clearly describe the use of the part-flow system in conjunction with the ballast discharge and the slop tank decanting procedures.

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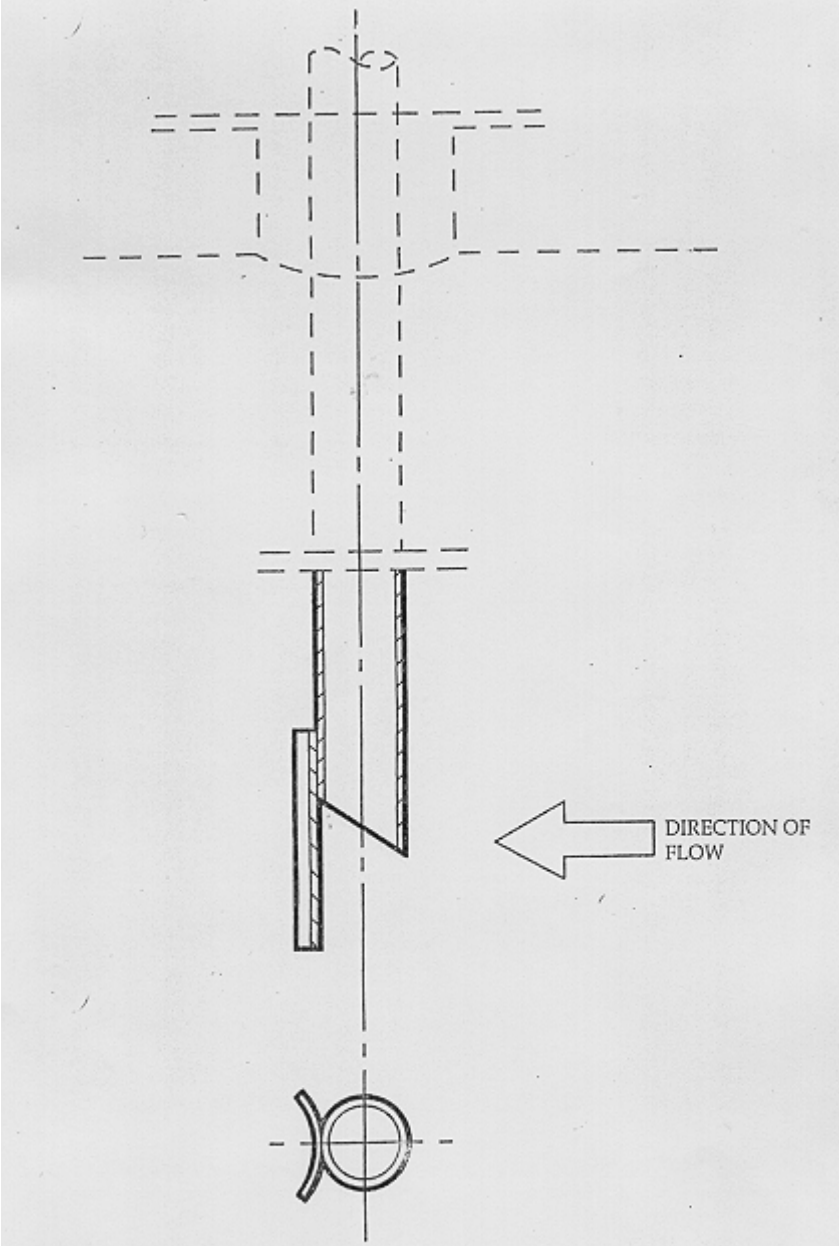

FIGURE 1

SAMPLING PROBE FOR PART-FLOW DISPLAY SYSTEM

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FOURTH SCHEDULE

Regulation 16 & 17

"SIDE AND BOTTOM DAMAGE" AND "HYPOTHETICAL OUTFLOW OF OIL"

The definitions below are necessary to determine the permissible size and arrangements of cargo tanks and for assessing the standard of subdivision of oil tankers.

Side and Bottom Damage

1. Side and bottom damage shall be assumed to be damage having the dimensions described in this Schedule caused to the side or bottom of the ship and in the case of bottom damage the dimensions to be assumed are those which relate to the position of damage, as described in this Schedule.

(1) SIDE DAMAGE		
(i) Longitudinal extent (l_c):	$\frac{1}{3}L^{\frac{2}{3}}$ or 14.5 metres, whichever is less	
(ii) Transverse extent (*tc*) (inboard from the ship's side at right angles to the centreline at the level corresponding to the assigned summer freeboard)	$\frac{B}{5}$ or 11.5 metres, whichever is less	
(iii) Vertical (*vc*)	from the base line upwards without limit	
(2) BOTTOM DAMAGE		
	FOR 0.3L FROM THE FORWARD PERPENDICULAR OF SHIP	**ANY OTHER PART OF THE SHIP**
Longitudinal extent (*ls*)	$\frac{L}{10}$	$\frac{L}{10}$ or 5 Metres whichever is less
Transverse extent (*ts*)	$\frac{B}{6}$ or 10 metres, whichever is less, but not less than 5 metres	5 metres
Vertical extent from the base-line (*vs*)	$\frac{B}{15}$ or 6 metres, whichever is less	

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Hypothetical Oil Outflow

2. The hypothetical outflow of oil in the case of side damage (O_c) and bottom damage (O_s) shall be calculated by the following formulae with respect to compartments breached by damage at all conceivable locations along the length of the ship to the extent as described in paragraph 1.

(1) For side damage

$$O_c = \sum W_i + \sum K_i C_i \qquad \textbf{(I)}$$

(2) For bottom damage

$$O_s = \frac{1}{3}\left(\sum Z_i W_i + \sum Z_i C_i\right) \qquad \textbf{(II)}$$

where:

W_i = volume in cubic metres of a wing tank assumed to be breached by the damage as described in paragraph 1; W_i for a segregated ballast tank may be taken as equal to zero.

C_i = volume in cubic metres of a centre tank assumed to be breached by the damage as described in paragraph 1; C_i for a segregated ballast tank may be taken as equal to zero.

$K_i = 1 - \frac{b_i}{t_c}$ and when b_i is equal or greater than t_c, K_i shall be taken as equal to zero.

$Z_i = 1 - \frac{h_i}{v_s}$ and when h_i is equal to or greater than v_s, Z_i shall be taken as equal to zero.

b_i = minimum width is metres of the wing tank under consideration, measured inboard from the ship's side at right angles to the centreline at the level corresponding to the assigned summer freeboard.

hi = minimum depth in metres of the double bottom under consideration; where no double bottom is fitted *hi* shall be taken as equal to zero.

3. Where a void space or segregated ballast tank of a length less than l_c as defined in paragraph 1 is located between wing oil tanks, O_c in formula (I) set out in paragraph 2(1) may be calculated on the basis of volume W_i being the actual volume of one such tank (where they are of equal capacity) or the smaller of the two tanks (where they differ in capacity), adjacent to such space, multiplied by S_i as defined below and taking for all other wing tanks involved in such a collision the value of the actual full volume of those tanks.

$$s_i = 1 - \frac{l_i}{l_c}$$

where -

l_i = length in metres of void space or segregated ballast tank under consideration.

4. (1) For the purpose of paragraph 2(1) credit shall only be given in respect of double bottom tanks which are either empty or carrying clean water only when cargo is carried in the tanks above.

(2) Where the double bottom does not extend for the full length and width of the tank involved, the double bottom shall be considered non existent and the volume of the tanks above the area of the bottom damage shall be included in formula (II) set out in paragraph 2(2) even if the tank is not considered breached because of the installation of such a partial double bottom.

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(3) Suction wells may be neglected in the determination of the value of hi provided such wells are not excessive in area and extend below the tank in no case more than half the height of the double bottom; where the depth of such a well exceeds half the height of the double bottom, h_i shall be taken to be equal to the double bottom height minus the well height.

(4) Where suction wells are installed within the double bottom, the following requirements shall be complied with:

(a) the piping serving such wells shall be fitted with valves or other closing arrangements located at the point of connection to the tank so as to prevent oil outflow in the event of damage to the piping;
(b) such piping shall be installed as high from the bottom shell as possible; and
(c) the valves shall be kept closed at sea whenever the tank contains oil cargo, except that they may be opened only to transfer cargo for trimming the ship.

5. In the case where the bottom damage simultaneously involves four centre tanks, the valve of O_s may be calculated according to the formula -

$$O_s = (\sum Z_i W_i + \sum Z_i C_I) \qquad \textbf{(III)}$$

6. In the case of bottom damage, a reduced amount of oil outflow may be assumed where a cargo transfer system is installed which has an emergency high suction in each cargo tank capable of transferring from a breached tank or tanks to segregated ballast tanks or to cargo tanks, where such tanks have sufficient ullage, and where the cargo transfer system complies with the following requirements -

(a) in two hours of operation it is capable of transferring oil equal to one half of the largest of the breached tanks involved;
(b) the ballast or cargo tanks are available and capable or receiving such quantity; and
(c) the pipes for suction are installed at a height of not less than the vertical extent of the bottom damage.

7. Where those requirements are satisfied, the calculation of *Os* shall be in accordance with formula (III) set out in paragraph 5.

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Regulation 18

FIFTH SCHEDULE

SUBDIVISION AND STABILITY CRITERIA

Damage Stability

1. (1) Every new oil tanker shall comply with the subdivision and damage criteria as specified in this Schedule, assuming side or bottom damage specified in paragraph 2, for any operating draught reflecting actual, partial or full load conditions consistent with the trim and strength of the ship as well as the specific gravities of the cargo; such damage shall be assumed to have occurred at all conceivable locations along the length of the ship as follows:

(a) in tankers of more than 225 metres in length, anywhere in the ship's length;
(b) in tankers of more than 150 metres, but not exceeding 225 metres in length, anywhere in the ship's length except locations involving either after or forward bulkheads bounding the machinery space located aft, which space shall be treated as a single floodable compartment;
(c) in tankers not exceeding 150 metres in length, anywhere in the ship's length between adjacent transverse bulkheads with the exception of the machinery space provided that a tanker of 100 metres or less in length which cannot fulfill all the requirements of paragraph 3 without materially impairing the operational qualities of the ship shall comply with such lesser requirements as the Director may impose.

(2) For the purposes of this paragraph, ballast conditions, where the tanker is not carrying oil in cargo tanks excluding oil residues, shall not be taken into account.

2. The following provisions regarding the extent and the character of the assumed damage shall apply:

(1) SIDE DAMAGE		
(i) Longitudinal extent (l_c):	$\frac{1}{3}L^{\frac{2}{3}}$ or 14.5 metres, whichever is less	
(ii) Transverse extent (*tc*) (inboard from the ship's side at right angles to the centreline at the level corresponding to the assigned summer freeboard)	$\frac{B}{5}$ or 11.5 metres, whichever is less	
(iii) Vertical (*vc*)	from the base line upwards without limit	
(2) BOTTOM DAMAGE		
	FOR 0.3L FROM THE FORWARD PERPENDICULAR OF THE SHIP	**ANY OTHER PART OF THE SHIP**
Longitudinal extent (*ls*)	$\frac{1}{3}L^{\frac{2}{3}}$ or 14.5 metres, whichever is less	$\frac{1}{3}L^{\frac{2}{3}}$ or 5 Metres whichever is less
Transverse extent (*ts*)	$\frac{B}{6}$ or 10 metres, whichever is less	$\frac{B}{6}$ or 10 metres, whichever is less
Vertical extent (*vs*)	$\frac{B}{15}$ or 6 metres, whichever is less measured from moulded line of the bottom shell plating at centre line	

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(3) Where damage of a lesser extent than the maximum extent of damage specified in subparagraph (2) would result in a more severe condition in relation to the ship's stability, such damage shall be assumed.

(4) Where the damage envisaged in paragraph 1(1)(a) or 1(1)(b) would involve transverse watertight bulkheads, such bulkheads shall not be considered effective unless they are spaced at a distance at least equal to the longitudinal extent of the assumed damage specified in subparagraph (2); where such bulkheads are spaced at a lesser distance, one or more of these bulkheads within such extent of damage shall be assumed to be non-existent for the purpose of determining which compartments are flooded.

(5) Where the damage envisaged in paragraph 1(1)(c) occurs between adjacent transverse watertight bulkheads no main transverse bulkhead or transverse bulkhead bounding side tanks or double bottom tanks shall be assumed damaged unless -

(a) the spacing between the adjacent bulkheads is less than the longitudinal extent of the assumed damage specified in subparagraph (2); or
(b) there is a step or recess in the transverse bulkhead of more than 3.05 metres in length, located within the extent of penetration of the assumed damage so however that the step formed by the after peak bulkhead and after peak tank top shall not be regarded as a step.

(6) Where pipes, ducts or tunnels are situated within the assumed extent of damage, arrangements shall be made so that progressive flooding cannot thereby extend to compartments other than those assumed to be floodable for each case of damage.

3. Oil tankers shall be regarded as complying with the damage stability criteria where the following requirements are met:

(a) the final waterline, taking into account sinkage, heel and trim, shall be below the lower edge of any opening through which progressive flooding may take place, and such openings shall include air pipes and those openings which are closed by means of weathertight doors or hatch covers, but may exclude those openings which are closed by means of watertight manhole covers and flush scuttles, small watertight cargo tank hatch covers which maintain the high integrity of the deck, remote operated watertight sliding doors, and side scuttles of the non-opening type;
(b) in the final stage of flooding, the angle of heel due to unsymmetrical flooding shall not exceed 25 degrees, provided that this angle may be increased by up to 3 degrees where no deck edge immersion occurs as a result of such increase;
(c) the stability in the final stage of flooding shall be investigated and may be regarded as sufficient where

(i) the righting lever curve has a range of at least 20 degrees beyond the condition of equilibrium in association with a maximum residual righting lever of at least 0.1 metre within the 20 degree range; and
(ii) the area under the curve within this range shall not be less than 0.0175 metre radian; and unprotected openings shall not be immersed within this range unless the space concerned is assumed to be flooded; however within this range, the immersion of any of the openings listed in subsubparagraph (a) and other openings capable of being closed weathertight may be permitted;

(d) equalisation arrangements requiring mechanical aids such as valves or cross-levelling pipes, where fitted, shall not be taken into account for the purpose of reducing an angle of heel or attaining the minimum range of residual stability to meet the requirements of subsubparagraphs (a) to (c) and sufficient residual stability shall be maintained during all stages where equalisation is used; spaces which are linked by ducts of large cross-sectional area may be considered to be as one; and
(e) the stability of the ship shall be sufficient during intermediate stages of flooding.

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4. (1) The requirements of paragraph 1 shall be deemed not to have been complied with unless compliance is confirmed by calculations which take into consideration the design characteristics of the ship, the arrangements, configuration and contents of the damaged compartments, and the distribution, specific gravities and free surface effect of liquids and the calculations shall be based on the criteria contained in subparagraphs (2) to (8).

(2) Account shall be taken of an empty or partially filled tank, the specific gravity of the cargo carried, and the outflow of liquids from the damaged compartments.

(3) The permeabilities assumed for spaces flooded as a result of damage shall be as follows:

Spaces	**Permeability**
Appropriate to stores	0.60
Occupied as crew accommodation	0.95
Occupied by machinery	0.85
Voids	0.95
Intended for consumable liquids	0 to 0.95*
Intended for other liquids	0 to 0.95*

(The permeability of partially filled compartments shall be consistent with the amount of liquid carried in the compartment. Whenever damage penetrates a tank containing liquid, it shall be assumed that the contents are completely lost from that compartment and replaced by salt water up to the level of the final plane of equilibrium.)*

(4) The buoyancy of a superstructure directly above the side damage shall not be taken into account.

(5) The unflooded parts of a superstructure beyond the extent of damage may be taken into account provided that they are separated from the damaged space by watertight bulkheads and that the requirements of paragraph 3(1) in respect of these intact spaces are complied with.

(6) Hinged watertight doors may be fitted in watertight bulkheads in the superstructure.

(7) The free surface effect shall be calculated at an angle of heel of 5 degrees for each individual compartment; however the Authority may require, or allow, the free surface corrections to be calculated at an angle of heel greater than 5 degrees for partially filled tanks.

(8) In calculating the effect of free surfaces of consumable liquids it shall be assumed that, for each type of liquid at least one transverse pair of tanks or a centreline tank has a free surface and the tank, or combination of tanks, to be taken into account shall be those where the effect of the free surface is the greatest.

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Regulation 19 & 20

SIXTH SCHEDULE

PROTECTION OF CARGO SPACES BY BALLAST TANKS OR SPACES OTHER THAN CARGO AND FUEL OIL

Oil Tankers Built after 5th July 1993

1. In the event of collision or grounding the entire cargo length shall be protected by ballast tanks, or spaces other than cargo and fuel oil tanks, as provided for in this Schedule.

2. Wing tanks or spaces shall extend either for the full depth of the ship's side or from the top of the double bottom to the uppermost deck, disregarding a rounded gunwale where fitted and they shall be arranged in such a way that the cargo tanks are located inboard of the moulded line of the side shell plating, nowhere less than the distance which, as shown in the figure at the end of this Schedule is measured at any cross-section at right angles to the side shell, as specified below -

$$w = 0.5 + \frac{DW}{20{,}000} \ (m);$$

or $w = 2.0$m;

whichever is the lesser, but with a minimum value of 1.0m.

3. The depth of each double bottom tank or space at any cross-section shall be such that the distance *h* between the bottom of the cargo tanks and the moulded line of the bottom shell plating measured at right angles to the bottom shell plating as shown in the said figure 1 is not less than specified below

h= B/15(m);

or $h = 2.0$m;

whichever is the lesser, but with a minimum value of 1.0m

4. At the turn of the bilge area or at locations without a clearly defined turn of the bilge, when the distances *h* and *w* are different, the distance *w* shall have preference at levels exceeding 1.5 *h* above the baseline as shown in the figure at the end of this Schedule.

5. (1) The aggregate capacity of wing tanks, double bottom tanks, forepeak tanks and afterpeak tanks used for ballast on crude oil tankers of 20,000 tons deadweight and above and product carriers of 30,000 tons deadweight and above, shall not be less than the capacity of segregated ballast tanks necessary to meet the requirements of regulation 7.

(2) Wing tanks or spaces and double bottom tanks used to meet the requirements of this paragraph shall be located as uniformly as practicable along the cargo tank length; additional segregated ballast capacity provided for reducing longitudinal hull girder bending stress, trim, etc., may be located anywhere within the ship.

6. Suction wells in cargo tanks may protrude into the double bottom below the boundary line defined by the distance *h* provided that such wells are as small as practicable and the distance between the well bottom and bottom shell plating is not less than 0.5 *h*.

7. Ballast and cargo piping and other piping such as sounding and vent piping to ballast tanks shall not pass through cargo tanks, and cargo piping and similar piping to cargo tanks shall not pass through ballast tanks; the Director may grant exemption from these requirements for short lengths of piping, provided that they are completely welded or equivalent.

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8. In the case of an oil tanker of 20,000 tons deadweight and above, the provisions regarding the extent and the character of the assumed damage shall be supplemented by the following assumed bottom raking damage -

(a) longitudinal extent
  (i) where the oil tanker is of 75,000 tons deadweight and above, 0.6*L* measured from the forward perpendicular; or
  (ii) where the oil tanker is less than 75,000 tons deadweight, 0.4*L* measured from the forward perpendicular;

(b) transverse extent
  B/3 anywhere in the bottom; and

(c) vertical extent
  breach of the outer hull.

9. Every oil tanker of less than 5,000 tons deadweight shall-

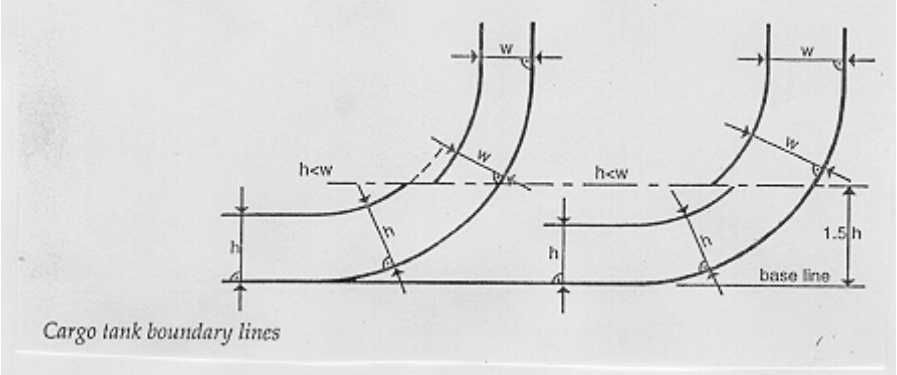
(a) be fitted with double bottom tanks or spaces having such a depth, that the distance *h* specified in paragraph 3 of this Schedule complies with the following:
  h= B/15,
    with a minimum value of 0.76m;

(b) have, in the turn of the bilge area and at locations without a clearly defined turn of the bilge, the cargo tank boundary line running parallel to the line of the mid-ship flat bottom as shown in the Eighth Schedule; and

(c) be provided with cargo tanks so arranged that the capacity of each cargo tank does not exceed 700m3 unless wing tanks or spaces are arranged in accordance with subparagraph 1(1), but with the distance *w* computed as follows-

$$w = 0.4 + \frac{2.4DW}{20,000}$$

with a minimum value of *w* = 0.76m.



(Figure referred to in paragraph 2)

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Regulation 19 & 20

SEVENTH SCHEDULE

CALCULATION OF HYDROSTATIC PRESSURE

All tankers built after 5th July 1993

1. Double bottom or spaces may be dispensed with, provided that the design of the tanker is such that the cargo and vapour pressure exerted on the bottom shell plating forming a single boundary between the cargo and the sea does not exceed the hydrostatic water pressure as expressed by the following formula

$$f\ h_c\ p_c\ g + 100\Delta p \leq d_n\ p_s\ g$$

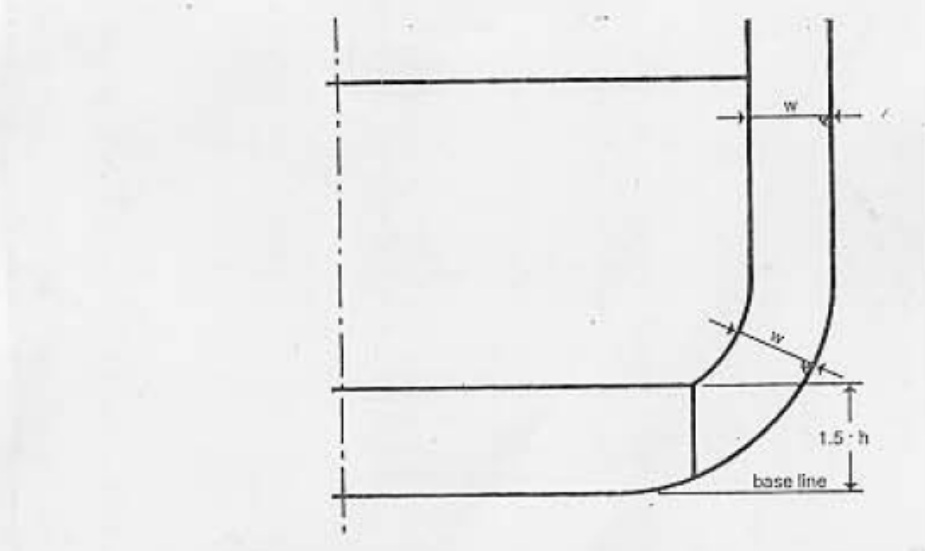
where:

h_c = height of cargo in contact with the bottom shell plating in metres;
p_c = maximum cargo density in t/m3;
d_n = minimum operating draught under an expected loading condition in metres;
p_s = density of sea water in t/m3;

Δp = maximum set pressure of pressure/vacuum valve provided for the cargo tank in bars;
f = safety factor = 1.1;
g = standard acceleration of gravity (9.81m/s2).

2. A horizontal partition necessary to fulfil the requirements of paragraph 1 shall be located at a height of not less than B/6 or 6 metres, whichever is the lesser, but not more than 0.6*D*, above the baseline (where *D* is the moulded depth amidships).

3. Where the double bottom tanks or spaces are dispensed with pursuant to paragraph 1, the location of wing tanks or spaces shall be in accordance with paragraph 2 of the Sixth Schedule except that, below a level 1.5*h* above the baseline (where *h* is as defined in paragraph 3 of that Schedule), the cargo tank boundary line may be vertical down to the bottom plating as shown in the following figure:



Cargo tank boundary lines

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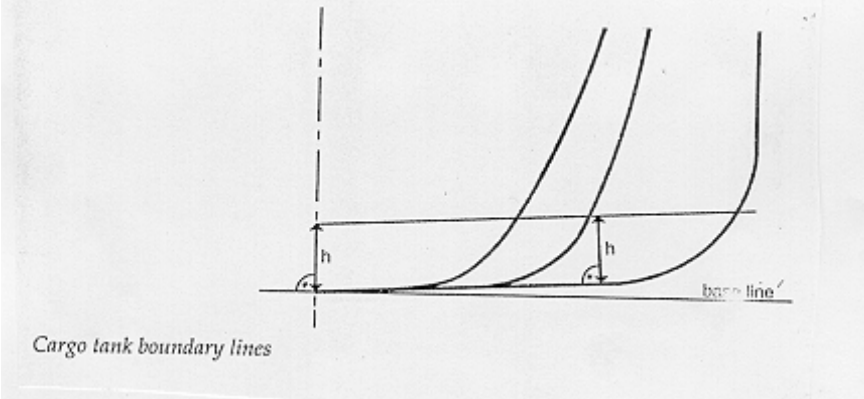
EIGHTH SCHEDULE

Paragraph 9 of the Sixth Schedule

HEIGHT OF DOUBLE BOTTOMS IN TANKERS OF LESS THAN 5,000 TONS DEADWEIGHT

The height of the double bottom tanks or spaces in oil tankers of less than 5, 000 tons deadweight shall be measured so that in the turn of the bilge area and at locations without a clearly defined turn of the bilge, the cargo tank boundary line shall run parallel to the mid-ship flat bottom as shown in the following figure.



NINTH SCHEDULE

Regulation 22

INTACT STABILITY FOR OIL TANKERS OF 5,000 TONS DEADWEIGHT OR MORE

This Schedule gives effect to Regulation 25A of Annex 1 to MARPOL introduced by IMO Resolution MEPC.75(40).

1. The intact stability criteria for oil tankers to which this Part of this Schedule applies are specified in subsubparagraphs (a) and (b), as appropriate, for an operating draught under the worst possible conditions of cargo and ballast loading, consistent with good operational practice, including intermediate stages of liquid transfer operations; and under all conditions the ballast tanks shall be assumed slack.

(a) in port, the initial metacentric height GMo, corrected for free surface measured at 0º heel, shall not be less than 0.15m;

(b) at sea, the following criteria shall be applicable-

(i) the area under the righting lever curve (GZ curve) shall be not less than 0.055 m.rad up to $\theta = 30º$ angle of heel and not less than 0.09 m.rad up to $\theta = 40º$ or other angle of flooding θ_f * where this angle is less than 40º. Additionally, the area under the righting lever curve (GZ curve) between the angles of heel of 30º and 40º or between 30º and θ_f, where this angle is less than 40º, shall be not less than 0.03 m.rad;

(ii) the righting lever GZ shall be at least 0.20m at an angle of heel equal to or greater than 30º;

(iii) the maximum righting arm shall occur at an angle of heel preferably exceeding 30º but not less than 25º; and

(iv) the initial metacentric height GMo, corrected for free surface measured at 0º heel, shall be not less than 0.15m.

2. The requirements of paragraph 1 shall be met through design measures. For combination carriers simple supplementary operational procedures may be allowed.

3. "Simple supplementary operational procedures" for liquid transfer operations referred to in paragraph 2 means written procedures made available to the master which-

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(a) are approved by the Director;
(b) indicate those cargo and ballast tanks which may, under any specific condition of liquid transfer and possible range of cargo densities, be slack and still allow the stability criteria to be met. The slack tanks may vary during the liquid transfer operations and may be of any combination provided they satisfy the criteria;
(c) will be readily understandable to the officer-in-charge of liquid transfer operations;
(d) provide for planned sequences of cargo/ballast transfer operations;
(e) allow comparisons of attained and required stability using stability performance criteria in graphical or tabular form;
(f) require no extensive mathematical calculations by the officer-in charge;
(g) provide for corrective actions to be taken by the officer-in-charge in case of departure from recommended values and in case of emergency situations; and
(h) are prominently displayed in the approved trim and stability booklet and at the cargo/ballast transfer control station and in any computer software by which stability calculations are performed.

Made in Cabinet the 6th day of January 2004

Merideth Hew

Acting Clerk of the Cabinet

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