
STATUTORY INSTRUMENTS

1990 No. 892

The Merchant Shipping (Passenger Ship Construction and Survey) (Amendment) Regulations 1990

PART "B"

AMENDMENTS TO 1984 REGULATIONS

4.—(1) The Merchant Shipping (Passenger Ship Construction and Survey) Regulations 1984(1) shall be amended in accordance with the following:

In regulation 1(2) the following definitions shall be inserted in the appropriate alphabetical order:

““nominated surveyor” means a surveyor nominated by the Secretary of State to undertake the surveys required by these Regulations and includes a marine surveyor of the Department of Transport;”

““Post 1990 ship” means a passenger ship the keel of which is laid, or which is at a similar stage of construction, on or after 29th April 1990 or a cargo ship which is converted to a passenger ship on or after that date;”

““proper officer” means a consular officer appointed by Her Majesty’s Government in the United Kingdom and, in relation to a port in a country outside the United Kingdom which is not a foreign country, also any officer exercising in that port functions similar to those of a superintendent;”

““Ro/ro passenger ship” means a passenger ship provided with cargo or vehicle spaces not normally subdivided in any way and extending to either a substantial length or the entire length of the ship in which vehicles or cargo can be loaded or unloaded in a horizontal direction;”

““Stability information book” means the book required to be provided in compliance with regulation 9A(8) of these Regulations;”

““United Kingdom ro/ro passenger ship” means a ro/ro passenger ship which is a United Kingdom ship;”.

(2) Regulation 1(3) shall be replaced by the following:—

“(3) These Regulations apply:—

- (i) to new United Kingdom passenger ships wherever they may be,
- (ii) subject to the exceptions mentioned below in this paragraph, to other new passenger ships while they are within the United Kingdom or the territorial waters thereof, and
- (iii) to the extent that the Secretary of State deems reasonable and practical, to any major repairs, alterations or modifications to existing United Kingdom passenger ships

except that

- (a) regulations 9B to 9L shall not apply to ships which are not United Kingdom ships,
 - (b) regulations 16, 17 and 20 shall not apply to new passenger ships which are not United Kingdom ships; but such ships shall comply instead with regulations 16, 17 and 19 of the Merchant Shipping (Passenger Ship Construction) Regulations 1980, and
 - (c) Part VIA shall only apply to ro/ro passenger ships which are not United Kingdom ships while they are within the United Kingdom or the territorial waters thereof.”.
- (3) There shall be added after regulation 1(4) the following:–
- “(5) Where a ship is managed by a person other than its owner (whether on behalf of the owner or some other person, or on his own behalf), a reference in these Regulations to the owner shall be construed as including a reference to that person.”.
- (4) Regulation 9 shall be replaced by the following regulations 9A to 9L:

“Inclining, Stability information, loading and stability assessment

Inclining and Stability information

9A.—(1) This regulation applies to every United Kingdom passenger ship to which these Regulations apply.

(2) Every ship on her completion shall be inclined and the elements of her stability determined. The master shall be supplied by the owner with reliable information relating to the stability of the ship in accordance with the following provisions of this regulation. The information relating to stability shall, before issue to the master, be submitted to the Secretary of State for approval, together with a copy thereof for his retention and shall incorporate such additions and amendments as the Secretary of State may in any particular case require.

(3) Every ship of Classes I, II and IIA and every ro/ro ship of Class IV shall undergo a lightweight survey to determine the ship’s lightship displacement and longitudinal position of its centre of gravity, before 29th April 1992 unless it has been inclined since 29th April 1987. Every such lightweight survey shall be subject to the conditions specified in paragraph (4) of this regulation.

(4) Every ship of Classes I, II and IIA and every ro/ro ship of Class IV shall have a lightweight survey carried out within each period of five years to verify any changes in lightship displacement and longitudinal centre of gravity. Such periods shall commence on the date of issue of either a Passenger and Safety Certificate or Passenger Certificate subsequent to a previous inclining or lightweight survey, whichever date is the earliest. The ship shall be re-inclined whenever, in comparison with the ship’s approved stability information derived from the previous inclining experiment, a deviation from the lightship displacement exceeding 2% or a deviation of the longitudinal centre of gravity exceeding 1% of the ship’s length is found or anticipated. Every inclining or lightweight survey made for this purpose or for the purpose of paragraph (3) of this regulation shall be carried out in the presence of a Department of Transport Surveyor. The interval between lightweight surveys of any such ship may be extended by the Secretary of State for a period of not more than one year if he is satisfied, on the production to him of relevant information about the ship, that the lightweight survey is not necessary at the required interval.

(5) A report of each inclining or lightweight survey carried out in accordance with paragraphs (3) and (4) of this regulation and of the calculation therefrom of the lightship condition particulars shall be submitted to the Secretary of State for approval, together with a copy for his retention. The approved report shall be placed on board the ship by the owner in

the custody of the master and shall incorporate such additions and amendments as the Secretary of State may in any particular case require. The amended lightship condition particulars so obtained from time to time shall be used by the master in substitution for such previously approved particulars when calculating the ship's stability.

(6) Following any inclining or lightweight survey carried out in accordance with the requirements of paragraphs (3) and (4) of this regulation on the basis of which the elements of the ship's stability have been then determined the master shall be supplied, by the owner, with amended stability information if the Secretary of State so requires. The information so supplied shall be submitted to the Secretary of State for approval, together with a copy thereof for his retention and shall incorporate such additions and amendments as the Secretary of State may in any particular case require.

(7) Where any alterations are made to a ship so as materially to affect the stability information supplied to the master, amended stability information shall be provided. The ship shall be re-inclined if the Secretary of State so requires.

(8) Stability information provided pursuant to paragraphs (2), (5), (6) and (7) of this regulation shall be furnished in the form of a book ("the stability information book") which shall be kept on board the ship at all times in the custody of the master. The information shall include particulars appropriate to the ship in respect of the matters specified in Schedule 2 to these Regulations and shall be in the form set out in that Schedule.

(9) Every ship have a scale of draughts marked clearly at the bow and stern.

Loading and Stability Assessment

9B. Regulations 9C to 9L apply to United Kingdom ships of Classes I, II, II(A) and to United Kingdom ro/ro ships of Class IV including every ship in respect of which there is in force a Passenger and Safety Certificate or Passenger Certificate appropriate to a ship of any of those classes even when it is for the time being engaged on voyages for which a Class III, V, VI or VI(A) Passenger Certificate is appropriate.

Information on stability during loading

9C.—(1) The owner of every ship to which this regulation applies shall ensure that the master is provided with information relating to its stability during the process of loading and unloading. This information shall be included in the ship's stability information book.

(2) Where any alterations are made or changes occur to the ship so as materially to affect the information supplied to the master in accordance with paragraph (1) of this regulation, amended information shall be provided.

(3) The information provided pursuant to paragraphs (1) and (2) of this regulation shall be kept on board the ship at all times in the custody of the master.

Stability and freeboard during loading and unloading

9D. The master shall use the information provided in accordance with regulation 9C and, when necessary, make calculations or cause calculations to be made in order to ensure that the process of loading and unloading is carried out safely; in particular, he shall ensure that:—

- (a) the ship has adequate stability; and
- (b) the freeboard at any door giving access to the hull or to an enclosed superstructure is sufficient to prevent the entry of water.

Recording of draught, trim and freeboard prior to departure

9E.—(1) On completion of the loading of the ship and before it proceeds on a voyage, the master or an officer appointed for the purpose by the master shall ascertain:—

- (a) the ship's draught at the bow and at the stern;
- (b) the trim of the ship by the bow or the stern; and
- (c) the vertical distance from the waterline to the appropriate subdivision load line mark on each side of the ship.

(2) The draughts, trim and the vertical distances ascertained in accordance with paragraph (1) of this regulation shall be recorded by the master or such officer as the case may be in the official log book, or in the case of Class IV ships in a book retained on board for that purpose.

Calculation of stability prior to departure

9F.—(1) On completion of the loading of a ship of Class I, II or II(A) and before the ship proceeds on a voyage the master shall cause the vertical position of the ship's centre of gravity relative to its keel (KG), or its transverse metacentric height (GM), whichever is appropriate for the ship, to be calculated.

(2) In the case of ships of Class II or II(A) the actual weights of goods vehicles and other items of cargo required to be provided shall be in accordance with the Merchant Shipping (Weighing of Goods Vehicles and other Cargo) Regulations 1988(2). In the case of ships of Class I the actual weights of goods vehicles and other items of cargo shall be used and shall be determined in accordance with those Regulations as if that ship was a ship of Class II. For items not required to be so weighed, the declared weights or weights estimated as accurately as possible shall be used.

(3) The calculation shall be made using an on-board loading and stability computer, or an approved shore-based loading and stability computer system, or by such other means as will enable accurate results to be obtained. The method by which the calculation is made shall be in accordance with Merchant Shipping Notice No M 1413.

(4) The master shall record the result of the calculation in the official log book.

(5) Where the calculation is made by means of a shore-based loading and stability computer system, a print-out of the calculation shall be presented to the master before the ship proceeds on its voyage. It shall be the duty of the person responsible for that system to ensure that the calculations are substantially correct.

(6) A full record of the calculation, or a copy thereof, shall be retained on the ship for at least one calendar month after the calculation is made and shall be made available for inspection at any time during that period. In the case of a ship of Class II or II(A) a copy of the record, or the record itself, shall be forwarded as soon as is practicable to the person designated by the owner under regulation 6 of the Merchant Shipping (Operations Book) Regulations 1988(3) and retained by him for a period of at least one calendar month. In the case of a ship of Class I a copy of the record, or the record itself, shall be forwarded to a person nominated by the owner and retained by him for a period of at least one calendar month.

Permissible standard of stability to be recorded

9G. Before a ship of Class I, II or II(A), or a ro/ro ship of Class IV to which regulation 9L applies, proceeds on a voyage the master shall cause the maximum permissible KG, or the

(2) S.I. 1988/1275.

(3) S.I. 1988/1716.

minimum permissible GM, whichever is appropriate to the ship, to be determined and recorded in the official log book, or in the case of Class IV ships in a book retained on board for that purpose.

Condition of loading prior to departure to be satisfactory

9H. Before a ship of Class I, II or II(A) or a ro/ro ship of Class IV to which regulation 9L applies, proceeds on a voyage the master shall ensure that the condition of loading of the ship as recorded in accordance with regulations 9E(2) and 9F(4) is within the permissible standard of stability determined in accordance with regulation 9G and satisfies all the relevant requirements prescribed in the stability information book.

Draught marks and automatic draught gauge system

9I.—(1) Every ship of Class II shall be provided with a reliable automatic draught gauge system, complying with the requirements of Merchant Shipping Notice No M 1413.

- (a) (2) Every ship of Class I or II(A) engaged on services which afford only short periods in port or where insufficient lighting is available during periods of darkness, or which include the use of berths exposed to adverse weather, shall be provided with a reliable automatic draught gauge system as prescribed in paragraph (1) of this regulation.
- (b) Every other ship of Class I or II(A) shall be provided with such an automatic draught gauge system, except where the draught marks are located where they can be easily read.

Approval of loading conditions for Class IV ships

9J.—(1) Where a ro/ro ship of Class IV plies regularly to and from the same place, in conditions of loading which correspond closely to conditions of loading which are clearly specified in the stability information book, the owner may apply to the Secretary of State for approval of the adoption of the conditions so specified for the purposes of loading in accordance with this regulation.

(2) The Secretary of State may, subject to such conditions as he thinks fit, approve the conditions of loading so specified for the purposes of this regulation if he is satisfied that each such specified condition of loading allows a sufficient margin of stability beyond the minimum required for safety purposes, to allow for small variations which might occur between a specified condition of loading and the actual loading of the ship.

Loading of Class IV ships in accordance with approved conditions

9K.—(1) The master of a ro/ro ship of Class IV in respect of which the Secretary of State has approved conditions of loading in accordance with regulation 9J(2) shall, before the ship proceeds on a voyage:—

- (a) ensure that the actual condition of loading of the ship corresponds closely to one of the specified conditions of loading so approved; and
- (b) record the specified condition of loading so approved to which the actual condition of loading corresponds, in a book specially retained on board for that purpose.

(2) A copy of the information required by paragraph (1)(b) of this regulation shall be forwarded, as soon as is practicable, to a person nominated by the owner as being responsible and retained in his custody for a period of at least one calendar month.

(3) As an alternative to complying with paragraph (1) of this regulation the master of such a ship may comply with the requirements of regulation 9L.

Class IV ships which are not loaded in accordance with approved loading conditions

9L. Where ro/ro ships of Class IV are not loaded in a manner corresponding to specified conditions of loading which have been approved in accordance with regulation 9J, the requirements of regulations 9F, 9G and 9H shall apply as they apply in the case of ships of Classes I, II and II(A), except that a copy of the record of the stability calculation shall be retained ashore, by a person nominated by the owner as being responsible, for a period of not less than one calendar month.”.

(5) Regulation 11 shall be replaced by the following regulations 11A and 11B:–

“Stability in damaged condition

11A.—(1) This regulation applies to all passenger ships to which these Regulations apply except post 1990 ships.

- (a) (2) In addition to the requirements of regulation 10 of these Regulations, every ship shall be so constructed as to provide sufficient intact stability in all service conditions to enable the ship to withstand the flooding of any one of the main compartments into which the ship is sub-divided in accordance with the provision of regulation 6 of these Regulations. The sufficiency of intact stability required shall be calculated in accordance with Parts 1 and 2 of Schedule 3 to these Regulations. If two of the main compartments, being adjacent to each other, are separated by a bulkhead which is stepped under the conditions of paragraph 6(3)(a) of Schedule 1 to these Regulations, the intact stability shall be adequate to withstand the flooding of those two adjacent main compartments.
- (b) Where in any such ship the factor of subdivision required under paragraph 4 or paragraph 9 of Schedule 1 to these Regulations is .50 or less but more than .33, the intact stability shall be adequate to withstand the flooding of any two adjacent main compartments.
- (c) Where in any such ship the factor of subdivision required under paragraph 4 of Schedule 1 to these Regulations is .33 or less, the intact stability shall be adequate to withstand the flooding of any three adjacent main compartments.
- (a) (3) For the purposes of this regulation the sufficiency of the intact stability of every such ship shall be determined in accordance with the provisions of Parts 1 and 2 of Schedule 3 to these Regulations.
- (b) The intact stability of every United Kingdom ro/ro passenger ship shall be re-examined in accordance with the provisions of Part 2 of Schedule 3 to these Regulations in order to establish the sufficiency of positive stability provided as required by regulation 11A(2)(a) and 11A(3)(a) whenever considered necessary by the Secretary of State in connection with amended stability information prepared in accordance with regulation 9A(6) and (7). Such re-examinations shall demonstrate to the satisfaction of the Secretary of State that at all stages of flooding there is sufficient positive residual stability after the assumed damage prescribed in Part 1 of Schedule 3.
- (a) (4) Every ship shall be so constructed as to keep asymmetrical flooding, when the ship is in a damaged condition, at the minimum consistent with efficient arrangements. If cross-flooding fittings are provided in any such ship the fittings shall, where practicable, be self-acting but in any case where controls to cross-flooding fittings are provided, they shall be capable of being operated from above

the bulkhead deck. Such fittings together with their controls as well as the maximum heel before equalisation shall be such as will not endanger the safety of the ship. The cross-flooding fittings shall be capable of reducing the heel within 15 minutes, sufficiently to meet the requirements of sub-paragraph (2)(c) of paragraph 2 of Part 2 of Schedule 3 to these Regulations.

- (b) If the margin line may become submerged during the flooding assumed for the purposes of the calculation referred to in Schedule 3 to these Regulations, the construction of the ship shall be such as will enable the master of the ship to ensure:
 - (i) that the maximum angle of heel during any stage of such flooding will not be such as will endanger the safety of the ship; and
 - (ii) that the margin line shall not be submerged in the final stage of flooding.
- (a) (5) There shall be provided by the owner in every ship, which is required by Part IIA of these Regulations to be subdivided, a document for the use of the master of the ship containing:—
 - (i) information as to the use of any cross-flooding fittings provided in the ship;
 - (ii) information necessary for the maintenance of sufficient intact stability under service conditions to enable the ship to withstand damage to the extent referred to in Part 1 of Schedule 3 to these Regulations; and
 - (iii) information as to the conditions of stability on which the calculations of heel have been based, together with a warning that excessive heeling might result should the ship sustain damage when in a less favourable condition.

This additional information shall be included in the stability information book.

11B.—(1) This regulation only applies to post 1990 ships.

- (a) (2) In addition to the requirements of regulation 10 of these Regulations, every ship shall be so constructed as to provide sufficient intact stability in all service conditions to enable the ship to withstand the flooding of any one of the main compartments into which the ship is subdivided in accordance with the provision of regulation 6 of these Regulations. The sufficiency of intact stability required shall be calculated in accordance with Parts 1 and 3 to Schedule 3 of these Regulations. If two of the main compartments, being adjacent to each other, are separated by a bulkhead which is stepped under the conditions of paragraph 6(3)(a) of Schedule 1 to these Regulations, the intact stability shall be adequate to withstand the flooding of those two adjacent main compartments.
 - (b) Where in any such ship the factor of subdivision required under and subject to the provisions of paragraph 4 or paragraph 9 of Schedule 1 to these Regulations is .50 or less but more than .33, the intact stability shall be adequate to withstand the flooding of any two adjacent main compartments.
 - (c) Where in any such ship the factor of subdivision required under paragraph 4 of Schedule 1 to these Regulations is .33 or less, the intact stability shall be adequate to withstand the flooding of any three adjacent main compartments.
- (3) For the purposes of this regulation the sufficiency of the intact stability of every such ship shall be determined in accordance with the provisions of Parts 1 and 3 of Schedule 3 to these Regulations.
- (a) (4) Every ship shall be so constructed as to keep asymmetrical flooding when the ship is in a damaged condition at the minimum consistent with efficient arrangements. If cross-flooding fittings are provided in any such ship the fittings shall, where practicable, be self-acting but in any case where controls to cross-

flooding fittings are provided, they shall be capable of being operated from above the bulkhead deck. Such fittings together with their controls shall be such as will not endanger the safety of the ship. The maximum angle of heel after flooding but before equalisation shall not exceed 15 degrees. The cross-flooding fittings shall be capable of reducing the heel within 15 minutes, sufficiently to meet the requirements of paragraph 3(2)(ii) of Part 3 of Schedule 3 to these Regulations.

- (b) If the margin line may become submerged during the flooding assumed for the purposes of the calculation referred to in Schedule 3 to these Regulations, the construction of the ship shall be such as will enable the master of the ship to ensure:
- (i) that the maximum angle of heel during any stage of such flooding will not be such as will endanger the safety of the ship but shall not exceed the maximum heel defined in paragraph 3(2)(ii) of Part 3 of Schedule 3;
 - (ii) that the margin line shall not be submerged in the final stage of flooding.
- (a) (5) There shall be provided by the owner in every ship, which is required by Part IIA of these Regulations to be subdivided, a document for the use of the master of the ship containing:—
- (i) information as to the use of any cross-flooding fittings provided in the ship;
 - (ii) information necessary for the maintenance of sufficient intact stability under service conditions to enable the ship to withstand damage to the extent referred to in Schedule 3 to these Regulations; and
 - (iii) information as to the conditions of stability on which the calculations of heel have been based, together with a warning that excessive heeling might result should the ship sustain damage when in a less favourable condition.

This additional information shall be included in the stability information book.”.

- (6) In regulation 80B for the reference to “1(3)(b)” there shall be substituted “1(3)(c)”.
- (7) Regulation 82 shall be replaced by the following:—

“Responsibilities of owner and master

82.—(1) The owner or master of every ship to which these Regulations apply shall ensure that:

- (a) the condition of the ship and its equipment is maintained so as to comply with the relevant provisions of these Regulations;
- (b) after every survey required by these Regulations has been completed, no material change shall be made in the structural arrangement, machinery, equipment and other items subject to such survey, without the approval of the Secretary of State; and
- (c) whenever an accident occurs to a ship or a defect is discovered either of which affects the safety of the ship or the efficiency or completeness of its equipment, it shall be reported at the earliest opportunity to the Secretary of State or a proper officer, either of whom shall cause investigations to be initiated to determine whether a survey by a nominated surveyor is necessary and shall in that event require such a survey to be carried out. If the ship is in a port outside the United Kingdom the master or owner shall, in addition, make such a report immediately to the appropriate authorities of the country in which the port is situated.

(2) The nominated surveyor shall ascertain from the appropriate authorities of the country in which the port is situated that the report referred to in paragraph 1(c) of this regulation has been made.”.

(8) Regulation 86 shall be renumbered regulation 86(1), and the words “other than the requirements of regulations 9C to 9L” added after “Regulations”.

(9) After regulation 86(1) the following new paragraphs shall be inserted:–

“(2) Any contravention of regulation 9C(1), 9C(2) or 9I shall be an offence on the part of the owner, and any contravention of regulations 9D, 9E, 9F(1), (2), (3) and (4), 9G, 9H, 9K(1) or 9L shall be an offence on the part of the master. Any such offence shall be punishable on summary conviction by a fine not exceeding the statutory maximum or on conviction on indictment by imprisonment for a term not exceeding two years, or a fine or both.

(3) Any contravention of regulation 9F(5) shall be an offence by the person responsible for the approved shore-based system. Any such offence shall be punishable on summary conviction by a fine not exceeding the statutory maximum or on conviction on indictment by a fine.

(4) Any contravention of regulation 9E(1) by an officer appointed in accordance with that regulation shall be guilty of an offence punishable on summary conviction by a fine not exceeding level 3 on the standard scale or on conviction on indictment by a fine.

(5) If the master or any person designated by the owner as being responsible in accordance with the Regulations referred to in regulation 9F(6) or 9K(2) fails to carry out the requirements of that regulation he shall be guilty of an offence. Any such offence shall be punishable on summary conviction by a fine not exceeding level 3 on the standard scale or on conviction on indictment by a fine.

(6) It shall be a defence for a person charged with committing an offence under these Regulations to show that he took all reasonable steps to avoid committing the offence.”.

(10) Regulation 88(4) shall be replaced by the following:–

“**88.**—(1) After any survey required by these Regulations of any new or existing United Kingdom passenger ship to which Part IIA of these Regulations applies has been completed and a Passenger and Safety Certificate or a Passenger Certificate, as appropriate, has been issued, the Secretary of State may cancel such certificate if the ship has not carried out a lightweight survey or been inclined before 29th April 1992, or inclined or had a lightweight survey thereafter periodically as specified in regulation 9A(4).

(2) If any time the stability information supplied to the master is found to be invalid the Secretary of State may withdraw the certificate until new and valid stability information is supplied.”.

(11) In Schedule 2 paragraph 10(2) “Schedule III” shall read “Schedule 3”.

(12) Schedule 2, paragraph 12 shall be replaced by the following:–

“**12.** Such information, as is necessary to enable the master by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service, shall be provided in order that regulations 10, 11A and 11B of these Regulations will be complied with. This information shall be presented in the form of required metacentric height (GM) values or permissible vertical centre of gravity (KG) values and shall be presented in either graphical or tabular form. This information shall be provided on the basis of the ship being at level keel and at trims of 0.4%L and 0.8%L by the bow and by the stern over the range of displacements or mean draughts which are likely to occur in service: provided that for any such ships which are intended to operate at greater trims than are specified in this paragraph additional information shall be included. The Secretary of State may permit the substitution of lesser trims by the bow and stern as specified in this

paragraph if he is satisfied that such a lesser range of trims are sufficient for the purpose intended because of the characteristics of the particular ship.”.

(13) Schedule 3 shall be replaced by the following:–

“SCHEDULE 3

Regulations 11A and 11B

STABILITY IN DAMAGED CONDITION

PART 1

Assumptions on which calculations are to be based

1. The sufficiency of intact stability of every ship to which Part IIA of these Regulations applies shall be determined by calculation which has regard to the design and construction of the ship, and the damaged compartments, and which is in accordance with the following assumptions:

(1) the ship shall be assumed to be in the worst service conditions as regards stability which is likely to be experienced having regard to the intended service of the ship, or damage calculations shall be made over the operational draught range as a basis for curves of required metacentric height (GM) values or permissible vertical centre of gravity (KG) values.

(2) the volume permeabilities and surface permeabilities shall be assumed to be as follows:

Space ^(a)	Permeability
Occupied by cargo or stores	60
(in ships carrying goods vehicles and accompanying personnel the permeability of the cargo spaces shall be assumed in accordance with paragraph (2) of regulation 19)	
Appropriated for cargo or stores but not occupied by substantial quantities thereof	95
Appropriated as accommodation for passengers and crew	95
Appropriated for machinery	85
Appropriated for liquids	0 or 95, whichever results in the more onerous requirements.

(b) Higher surface permeabilities shall be assumed in respect of spaces which, in the vicinity of the damaged water plane, contain no substantial quantity of accommodation or machinery and spaces which are not generally occupied by any substantial quantity of cargo or stores.

(3) The extent of damage shall be assumed to be as follows:

(a) longitudinal extent: 3.00 metres plus 3 per cent of the length of the ship, or 11.00 metres or 10 per cent of the length of the ship, whichever is the least. Provided that where the required factor of subdivision is .33 or less, the assumed longitudinal extent of damage shall be increased as necessary so as to include any two consecutive main transverse watertight bulkheads;

- (b) transverse extent: 20 per cent of the breadth of the ship, measured inboard from the ship's side at right angles to the centre line at the level of the deepest subdivision load waterline taken parallel to the keel;
 - (c) vertical extent: from the base line upwards without limit;
 - (d) if any damage of lesser extent than that indicated in the foregoing sub-paragraphs (a), (b) and (c) would result in a more severe condition regarding heel or loss of metacentric height, such damage shall be assumed for the purposes of the calculation.
- (4) Where the ship is fitted with decks, inner skins or longitudinal bulkheads of sufficient tightness to restrict the flow of water, regard shall be had to such restrictions in the calculation.

PART 2

Sufficiency of the stability in the damaged condition as applicable to all passenger ships to which Part IIA of these Regulations apply, except post 1990 ships

2. The intact stability of the ship shall be deemed to be sufficient if the calculation specified in paragraph 1 of this Schedule shows that, after the assumed damage, the condition of the ship is as follows:

- (1) in the event of symmetrical flooding:
 - (a) at all stages of flooding there shall be sufficient positive residual stability to the satisfaction of the Secretary of State;
 - (b) at intermediate stages of flooding the margin line is not to be submerged unless partial subdivision above the margin line in accordance with regulation 24 limits sufficiently the spread of water along the bulkhead deck and results in an angle of heel not exceeding 20 degrees. In the case of ships carrying vehicles on the bulkhead deck, the angle of heel at intermediate stages of flooding shall not be greater than that which will submerge the margin line;
 - (c) at the final stage of flooding the margin line shall not be submerged and there shall be a positive residual metacentric height of at least 50 millimetres as calculated by the constant displacement method.
- (2) In the event of asymmetrical flooding:
 - (a) the provisions of sub-paragraph (1)(a) shall apply;
 - (b) the provisions of sub-paragraph (1)(b) shall apply;
 - (c) at the final stage of flooding, and after equalization measures, if any, have been taken, the angle of heel is not to exceed 7 degrees and the margin line is not to be submerged.
- (3) The range of stability in the damaged condition shall be to the satisfaction of the Secretary of State.

PART 3

Sufficiency of stability in the damaged condition as applicable to all passenger ships to which Part IIA of these Regulations apply and which are post 1990 passenger ships

3. The intact stability of the ship shall be deemed to be sufficient if the calculation specified in paragraph 1 of this Schedule shows that, after the assumed damage, the condition of the ship is as follows:

- (1) In the final stage after damage, and after equalisation where provided:
- (a) the positive residual righting lever curve shall have a minimum range of 15 degrees beyond the angle of equilibrium;
 - (b) the area under the righting lever curve shall be at least 0.015 metre radians, measured from the angle of equilibrium to the lesser of:
 - (i) The angle at which progressive flooding occurs;
 - (ii) 22 degrees (measured from the upright) in the case of one compartment flooding, or 27 degrees (measured from the upright) in the case of the simultaneous flooding of two or more adjacent compartments;
 - (c) a residual righting lever is to be obtained within the range specified in 2(a), taking into account the greatest of the following heeling moments:
 - (i) the crowding of all passengers towards one side;
 - (ii) the launching of all fully loaded davit-launched survival craft on one side;
 - (iii) due to wind pressure as calculated by the formula;

$$GZ \text{ (in metres)} = \frac{\text{heeling moment}}{\text{displacement}} + 0.04$$

However, in no case is this righting lever to be less than 0.10 m;

- (d) for the purpose of calculating the heeling moments in paragraph 3(c), the following assumptions shall be made:
 - (i) moments due to crowding of passengers;
 - (aa) 4 persons per square metre;
 - (bb) a mass of 75 kg for each passenger;
 - (cc) passengers shall be distributed on available deck areas towards one side of the ship on the decks where muster stations are located and in such a way that they produce the most adverse heeling moment.
 - (ii) moments due to launching of all fully loaded davit-launched survival craft on one side:
 - (aa) all lifeboats and rescue boats fitted on the side to which the ship has heeled after having sustained damage shall be assumed to be swung out fully loaded and ready for lowering;
 - (bb) for lifeboats which are arranged to be launched fully loaded from the stowed position, the maximum heeling moment during launching shall be taken;
 - (cc) a fully loaded davit-launched liferaft attached to each davit on the side to which the ship has heeled after having sustained damage shall be assumed to be swung out ready for lowering;
 - (dd) persons not in the life-saving appliances which are swung out shall not provide either additional heeling or righting moment;
 - (ee) life-saving appliances on the side of the ship opposite to the side to which the ship has heeled shall be assumed to be in a stowed position.
 - (iii) moments due to wind pressure:
 - (aa) a wind pressure of 120N/m² to be applied;
 - (bb) the area applicable shall be the projected lateral area of the ship above the waterline corresponding to the intact condition;

- (cc) the moment arm shall be the vertical distance from a point at one half of the mean draught corresponding to the intact condition to the centre of gravity of the lateral area;
 - (e) In intermediate stages of flooding the maximum righting lever shall be at least 0.05 m and the range of positive righting levers shall be at least 7 degrees. In all cases only one breach in the hull and only one free surface need to be assumed.
- (2) The final condition of the ship after damage and, in the case of asymmetrical flooding, after equalisation measures have been taken shall be as follows:
- (i) In the case of symmetrical flooding there shall be a positive residual metacentric height of at least 50 mm as calculated by the constant displacement method;
 - (ii) In the case of asymmetrical flooding the angle of heel for one-compartment flooding shall not exceed 7 degrees. For the simultaneous flooding of two or more adjacent compartments a heel of 12 degrees shall not be exceeded;
 - (iii) In no case shall the margin line be submerged in the final stage of flooding. At intermediate stages of flooding the margin line is not to be submerged unless partial subdivision above the margin line in accordance with regulation 24 limits sufficiently the spread of water along the bulkhead deck and results in an angle of heel not exceeding 20 degrees. In the case of ships carrying vehicles on the bulkhead deck, the angle of heel at intermediate stages of flooding shall not be greater than that which will submerge the margin line.”.