



# RUSSIAN MARITIME REGISTER OF SHIPPING

**CIRCULAR LETTER**

**No. 312-10-1887c**

dated 24.01.2023

Re:

amendments to the Rules for the Classification and Construction of Sea-Going Ships, 2023, ND No. 2-020101-174-E

Item(s) of supervision:

yachts

Entry-into-force date:

**01.03.2023**

Cancels / amends / adds Circular Letter No.

dated

Number of pages: 1 + 13

Appendices:

Appendix 1: information on amendments introduced by the Circular Letter

Appendix 2: text of amendments to Part XX "Additional Requirements for Yachts"

Acting Director General

Sergey A. Kulikov

Text of CL:

We hereby inform that the Rules for the Classification and Construction of Sea-Going Ships shall be amended as specified in the Appendices to the Circular Letter.

It is necessary to do the following:

1. Bring the content of the Circular Letter to the notice of the RS surveyors, interested organizations and persons in the area of the RS Branch Offices' activity.
2. Apply the provisions of the Circular Letter during review and approval of the technical documentation on yachts (or equipment installed on board the yachts, or products/machinery installed on board the yachts) contracted for construction or conversion on or after 01.03.2023.
3. Allow the application of the provisions of the Circular Letter before the dates specified in para 2 above, if necessary.

List of the amended and/or introduced paras/chapters/sections:

Part XX: Section 1, paras 2.1, 2.5 — 2.8, 3.1, 5.1.3 — 5.1.7, 5.3.3 — 5.3.8, 5.10.1.1, 5.10.9.1.1, 5.10.10.1, 5.10.10.4, 5.10.10.7, 5.10.17.1, 5.14.1, 5.14.2, 5.15.1 and 5.15.2

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**Information on amendments introduced by the Circular Letter  
(for inclusion in the Revision History to the RS Publication)**

Nos.	Amended paras/chapters/ sections	Information on amendments	Number and date of the Circular Letter	Entry-into-force date
1	Section 1	New definitions "Margin line" and "Passenger spaces" have been introduced	312-10-1887c of 24.01.2023	01.03.2023
2	Para 2.1	Scope of application of Part XX has been specified	312-10-1887c of 24.01.2023	01.03.2023
3	Para 2.5	Requirements have been specified for yachts subject to the requirements of international conventions and codes	312-10-1887c of 24.01.2023	01.03.2023
4	Para 2.6	Procedure for application of Flag State MA requirements to yachts has been specified	312-10-1887c of 24.01.2023	01.03.2023
5	Para 2.7	Requirements for commercial yachts carrying more than 12 passengers have been specified	312-10-1887c of 24.01.2023	01.03.2023
6	Para 2.8	New para specifying the conditions for assigning class notation to yachts has been introduced	312-10-1887c of 24.01.2023	01.03.2023
7	Para 3.1	Conditions for assigning class notation to yachts have been specified	312-10-1887c of 24.01.2023	01.03.2023
8	Paras 5.1.3 — 5.1.7	New paras have been introduced setting requirements for ship structure and for tightness tests	312-10-1887c of 24.01.2023	01.03.2023
9	Paras 5.3.3 and 5.3.4	Requirements have been specified for subdivision of yachts carrying less than 12 passengers	312-10-1887c of 24.01.2023	01.03.2023
10	Paras 5.3.5 — 5.3.8	New paras 5.3.5 and 5.3.6 have been introduced, containing requirements for subdivision of passenger yachts; existing paras 5.3.5 — 5.3.6.10 and references thereto have been renumbered 5.3.7 — 5.3.8.10 accordingly	312-10-1887c of 24.01.2023	01.03.2023
11	Para 5.10.1.1	Scope of Chapter 5.10 "Electrical Equipment" has been specified	312-10-1887c of 24.01.2023	01.03.2023
12	Para 5.10.9.1.1	Scope of requirement for availability of sources of electrical power on yachts has been specified	312-10-1887c of 24.01.2023	01.03.2023
13	Para 5.10.10.1	Requirement has been specified for emergency source of electrical power for yachts, carrying from 13 to 36 passengers	312-10-1887c of 24.01.2023	01.03.2023

Nos.	Amended paras/chapters/ sections	Information on amendments	Number and date of the Circular Letter	Entry-into-force date
14	Para 5.10.10.4	Requirement has been specified for emergency transitional source of electrical power for yachts, carrying from 13 to 36 passengers	312-10-1887c of 24.01.2023	01.03.2023
15	Para 5.10.10.7	Requirement has been specified for emergency transitional source of electrical power for yachts, carrying from 13 to 36 passengers	312-10-1887c of 24.01.2023	01.03.2023
16	Para 5.10.17.1	Scope of requirement for general alarm system and fixed fire detection and fire alarm system has been specified	312-10-1887c of 24.01.2023	01.03.2023
17	Para 5.14.1	Scope of radio equipment requirements for yachts has been specified	312-10-1887c of 24.01.2023	01.03.2023
18	Para 5.14.2	Scope of radio equipment requirements for yachts has been specified	312-10-1887c of 24.01.2023	01.03.2023
19	Para 5.15.1	Scope of navigational equipment requirements for yachts has been specified	312-10-1887c of 24.01.2023	01.03.2023
20	Para 5.15.2	Scope of navigational equipment requirements for yachts has been specified	312-10-1887c of 24.01.2023	01.03.2023

## **RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF SEA-GOING SHIPS, 2023,**

**ND No. 2-020101-174-E**

### **PART XX. ADDITIONAL REQUIREMENTS FOR YACHTS**

#### **1 DEFINITIONS AND EXPLANATIONS**

1 After the definition "Commercial vessel" the new definitions "Margin line" and "Passenger spaces" are introduced reading as follows:

"Margin line is a line drawn at least 76 mm below the upper surface of the bulkhead deck at side.

Passenger spaces means those spaces which are provided for the accommodation and use of passengers, excluding baggage store, provision and mail rooms; spaces provided below the margin line for the accommodation and use of the crew shall be regarded as passenger spaces."

#### **2 APPLICATION**

2 **Para 2.1** is replaced by the following text:

**"2.1** Subject to 2.2 — 2.8, the requirements of this Part apply to the following motor, sailing and sailing-motor yachts, not carrying cargoes and made of steel or aluminium alloys, fiber-reinforced plastic materials, of length  $L_{LL}$  (as defined in Part II "Hull") 24 m and above:

for commercial use, not carrying more than 12 passengers and not engaged on international voyages;

regardless of the nature of use, carrying from 13 to 36 passengers inclusive, the total number of persons on which does not exceed 200 (passenger yachts in case of commercial use; passenger pleasure yachts in case of non-commercial use (recreation in water bodies)).

In accordance with 1.9 of "General Regulations" of the Rules for the Classification and Construction of Pleasure Craft, the requirements of this Part may be applied to pleasure yachts of 24 m and more in length as defined in the Rules for the Classification and Construction of Pleasure Craft, not carrying cargoes and more than 12 passengers.

For yachts made of wood, the Rules for the Classification and Construction of Wooden Ships apply."

3 **Para 2.5** is replaced by the following text:

**"2.5** For yachts subject to the requirements of international conventions and codes, the relevant requirements of those international documents shall apply, with account of 2.6."

4 **Para 2.6** is replaced by the following text:

**"2.6** Requirements (standards)<sup>1</sup> of the Flag State MA for yachts, if any, shall be met as a matter of priority. Where the requirements of the applicable standards for yachts prescribed by the Flag State MA differ from the provisions of the applicable conventions and codes, an official confirmation by the Flag State MA that the standards applied are equivalent

to the provisions of the applicable conventions and codes shall be required, in the manner established by the relevant conventions/codes.

<sup>1</sup> List of standards applied by the Register that provide an equivalent level of safety in relation to certain provisions of SOLAS 74 and LL-66/88, as decided by the Flag State MA:

Red Ensign Group – Yacht Code (Part A (Large Yacht Code) and Part B (Passenger Yacht Code (PYC)), Malta Commercial Yacht Code, Malta Passenger Yacht Code, Republic of the Marshall Islands Yacht Code (RMI Yacht Code), Bahamas Yacht Codes (BLYC – Bahamas Large Yacht Code; BSYC – Bahamas Small Charter Yacht Code; BPYC – Bahamas Passenger Yacht Code); other standards and codes in agreement with the Register Head Office."

5 **Para 2.7** is replaced by the following text:

**"2.7** Unless otherwise stated in this Part, commercial yachts carrying more than 12 passengers shall fully comply with all requirements of the Rules for the Classification and Construction of Sea-Going Ships that apply to passenger ships and, if applicable, the requirements of international conventions (SOLAS 74, LL-66/88, TM-69, MARPOL 73/78, etc.) and codes. Such commercial yachts carrying more than 12 passengers are passenger ships.

Commercial yachts carrying more than 12 but less than 36 passengers but not more than 200 persons on board, not carrying cargoes and engaged on international voyages, may be subject to the requirements of this Part, provided that the provisions of this Part do not conflict with the requirements of the Flag State MA taking into consideration 2.6."

6 **New para 2.8** is introduced reading as follows:

**"2.8** The class notation shall be assigned to yachts in accordance with Section 3."

### 3 CLASS OF A SHIP

7 **Para 3.1** is replaced by the following text:

**"3.1** The character of classification, distinguishing marks in the class notation are assigned in accordance with the general provisions and requirements given in Section 2 of Part I "Classification".

Subject to 3.2 and 3.3:

for commercial yachts, not carrying cargoes and more than 12 passengers, complying with the requirements of this Part, the main descriptive notation **Yacht for commercial service** shall be assigned;

for passenger yachts specified in 2.1, not engaged on international voyages (refer also to the Note below), complying with the requirements of this Part, the descriptive notation **Passenger yacht** shall be assigned.

**Note.** If the requirements of this Part and the standards for yachts acceptable to the Flag State MA are applied, the descriptive notation **Passenger yacht** may be assigned to commercial passenger yachts engaged on international voyages. Otherwise, yachts carrying more than 12 passengers, engaged on international voyages, are assigned the descriptive notation **Passenger ship** taking into account the provisions in 2.2 of Part I "Classification".

For sailing yachts, the design category shall be additionally determined for the purposes of correct application of certain provisions of the Rules for the Classification and Construction of Pleasure Craft."

## 5 TECHNICAL REQUIREMENTS

8 **New paras 5.1.3 — 5.1.7** are introduced reading as follows:

**5.1.3** A weather deck shall be fitted throughout the length of passenger yachts and be of adequate strength to withstand the external loads that may arise due to effects of the sea and weather conditions.

**5.1.4** The double bottom depth need not be taken as more than 2 m on passenger yachts.

**5.1.5** On passenger yachts, steps and recesses in watertight bulkheads shall be as strong as the bulkhead at the place where each occurs.

**5.1.6** On passenger yachts, the forepeak, double bottom spaces, including duct keel and inner skins, shall be hydrostatically tested to a head of water up to the bulkhead deck.

**5.1.7** Hydrostatical tests on passenger yachts for the purpose of ensuring that the structural arrangements are watertight shall not be regarded as a strength test. To evaluate the fitness of any compartment for the storage of oil fuel or other liquids, a test of a superior character may be required depending on the height to which the liquid has access in the tank or its connections."

9 **Para 5.3.3** is replaced by the following text:

**5.3.3** The yachts not carrying more than 12 passengers and cargoes, of length  $L_1 < 80$  m (as defined in Part V "Subdivision") shall comply with the below subdivision requirements."

10 **Para 5.3.4** is replaced by the following text:

**5.3.4** The yachts not carrying more than 12 passengers and cargoes, of length  $L_1 \geq 80$  m are subject to provisions in Section 2 of Part V "Subdivision" applicable to cargo ships."

11 **New para 5.3.5** is introduced reading as follows:

**5.3.5** The requirements in Section 2 of Part V "Subdivision" applicable to passenger ships shall apply to passenger yachts, taking into account the following alterations.

**5.3.5.1** When checking the probabilistic requirements for such yachts, the regulations of Explanatory Notes to SOLAS 74 Chapter II-1 shall be taken into account (refer to Collection of Regulating Documents, book nineteen, 2010).

**5.3.5.2** The required subdivision index  $R$  shall be calculated as follows:

$$R = 1 - 5000 / (L_s + 2,5N + 15225), \quad (5.3.5.2-1)$$

$$\text{where } N = N_1 + 2N_2; \quad (5.3.5.2-2)$$

$N_1$  = number of persons for whom lifeboats are provided;

$N_2$  = number of persons (including officers and crew) the ship is permitted to carry in excess of  $N_1$ .

**5.3.5.3** Where compliance with the requirement of 5.3.5.2 on the basis of  $N = N_1 + 2N_2$  is impracticable and where justification is provided that a suitably reduced degree of hazard exists<sup>1</sup>, a lesser value of  $N$  may be taken but in no case less than  $N = N_1 + N_2$ .

**5.3.5.4** In the calculation of index  $A$ , the level trim shall be used for the deepest subdivision draught and the partial subdivision draught. The actual service trim shall be used for the light service draught. If in any service condition, the trim variation in comparison with the calculated trim is greater than 0,5 % of  $L_s$ , one or more additional calculations of  $A$  shall be submitted for the same draughts but different trims so that, for all service conditions, the difference in trim in comparison with the reference trim used for one calculation shall be less than 0,5 % of  $L_s$ .

**5.3.5.5** The factor  $s_{final,i}$  shall be obtained from the formula:

$$s_{final,i} = K[(GZ_{max}/0,12)(Range/16)]^{1/4}, \quad (5.3.5.5-1)$$

<sup>1</sup> Regarding the term "reduced degree of hazard", the interpretation to Regulation 6.2.4 shall be applied, refer to Collection of Regulating Documents, book nineteen, 2010.

where  $GZ_{max}$  shall not be taken as more than 0,12 m;

$Range$  is  $16^\circ$ ;

$K = 1$ , if  $\theta_e \leq \theta_{min}$ ;

$K = 0$ , if  $\theta_e \geq \theta_{max}$ ;

$K = \sqrt{(\theta_{max} - \theta_e)/(\theta_{max} - \theta_{min})}$  otherwise,

(5.3.5.5-2)

where  $\theta_{min} = 7^\circ$ ;

$\theta_{max} = 15^\circ$ .

**5.3.5.6** The damage extent to be assumed when demonstrating compliance with 2.7.2 of Part V "Subdivision" shall be dependent on both  $N$  as defined in 2.2 of Part V "Subdivision", and  $L_s$  as defined in 1.2 of Part V "Subdivision", such that:

.1 where 400 or more persons shall be carried, a damage length of  $0,03L_s$  but not less than 3 m shall be assumed at any position along the side shell, in conjunction with a penetration inboard of  $0,1B$  but not less than 0,75 m measured inboard from the ship side, at right angle to the centreline at the level of the deepest subdivision draught;

.2 where 36 persons are carried, a damage length of  $0,015L_s$  but not less than 3 m shall be assumed, in conjunction with a penetration inboard of  $0,05B$  but not less than 0,75 m.

**5.3.5.7** Damage Stability Booklet shall additionally contain information on location of watertight doors that are allowed to be left open during the voyage."

12 **New para 5.3.6** is introduced reading as follows:

**"5.3.6** The following requirements are allowed to be applied to passenger yachts of length  $L_1 < 80$  m, if the requirements specified in 5.3.5 cannot be met.

**5.3.6.1 Floodable length.**

**5.3.6.1.1** The floodable length at any point shall be determined by a method of calculation which takes into consideration the form, draught and other characteristics of the ship in question.

**5.3.6.1.2** In a ship with a continuous bulkhead deck, the floodable length at a given point is the maximum portion of the length of the ship, having its centre at the point in question, which can be flooded under the definite assumptions set forth in 5.3.6.2 without the ship being submerged beyond the margin line.

**5.3.6.1.3** In the case of a ship not having a continuous bulkhead deck, the floodable length at any point may be determined to an assumed continuous margin line which at no point is less than 76 millimetres below the top of the deck (at side) to which the bulkheads concerned and the shell are carried watertight.

**5.3.6.2 Permeability.**

**5.3.6.2.1** The definite assumptions referred to in 5.3.6.1 relate to the permeability of the spaces below the margin line.

**5.3.6.2.2** In determining the floodable length, a uniform average permeability shall be used throughout the whole length of each of the following portions of the ship below the margin line:

- .1 the machinery room;
- .2 the portion forward of the machinery room; and
- .3 the portion abaft the machinery room.

**5.3.6.2.3** The uniform average permeability throughout the machinery room shall be determined from the formula:

$$85 + 10 \frac{a-c}{v}, \quad (5.3.6.2.3)$$

where  $a$  = the volume of passenger spaces;

$c$  = the volume of between-deck spaces below the margin line within the limits of the machinery room which are appropriated to stores; and

$v$  = the whole volume of the machinery room below the margin line.

**5.3.6.2.4** The permeability value may be assumed lower than specified above only in case a special permeability calculation is performed which is approved by the Register. The value obtained by detailed calculation may be used, with the permeability of passenger spaces

taken as 95, that of store spaces as 60, and that of double bottom, oil fuel and other tanks at such value as obtained from a special calculation approved by the Register.

**5.3.6.2.5** Except as provided in 5.3.6.2.6, the uniform average permeability throughout the portion of the ship forward of or abaft the machinery room shall be determined from the formula:

$$63 + 35 \frac{a}{v}, \quad (5.3.6.2.5)$$

where  $a$  = the volume of the passenger spaces which are situated below the margin line, forward of or abaft the machinery room; and

$v$  = the whole volume of the portion of the ship below the margin line forward of or abaft the machinery room.

**5.3.6.2.6** In the case of unusual arrangements, average permeability for the portions forward of or abaft the machinery room may be determined by a special calculation which shall be approved by the Register. For the purpose of such calculation, the permeability of passenger spaces shall be taken as 95, that of spaces containing machinery as 85, that of all store spaces as 60, and that of double bottom, oil fuel and other tanks at such value as obtained from a special calculation approved by the Register.

**5.3.6.2.7** Where a between-deck compartment between two watertight transverse bulkheads contains any passenger or crew space, the whole of that compartment, less any space completely enclosed within permanent steel bulkheads and appropriated to other purposes, shall be regarded as passenger space.

**5.3.6.3 Permissible length of compartments.**

**5.3.6.3.1 General.**

Ships shall be as efficiently subdivided as is possible having regard to the nature of the service for which they are intended and the degree of subdivision shall vary with the length of the ship and with the service, in such manner that the highest degree of subdivision corresponds with the ships of greatest length, primarily engaged in the carriage of passengers.

**5.3.6.3.2 Factor of subdivision.**

The maximum permissible length of a compartment having its centre at any point in the ship's length is obtained from the floodable length by multiplying the latter by an appropriate factor called the factor of subdivision.

**5.3.6.3.3** The factor of subdivision shall depend on the length of the ship, and for a given length shall vary according to the nature of the service for which the ship is intended and it shall decrease in a regular and continuous manner:

.1 as the length of the ship increases, and

.2 from a factor  $A$  to a factor  $B$ .

**5.3.6.3.4** The variations of the factors  $A$  and  $B$  shall be expressed by the following formulae:

$$A = \frac{58,2}{L_1 - 60} + 0,18, \quad (5.3.6.3.4-1)$$

where  $L_1 \geq 131$  m;

$$B = \frac{30,3}{L_1 - 42} + 0,18, \quad (5.3.6.3.4-2)$$

where  $L_1 \geq 79$  m.

**5.3.6.3.5 Criterion of service.**

**5.3.6.3.5.1** For a ship of given length the appropriate factor of subdivision shall be determined by the criterion of service numeral (hereinafter called the criterion numeral) as given by the following formulae:

when  $P_1$  is greater than  $P$

$$C_s = 72 \frac{M + 2P_1}{V + P_1 - P}, \quad (5.3.6.3.5.1-1)$$



in other cases

$$C_s = 72 \frac{M+2P}{V}, \quad (5.3.6.3.5.1-2)$$

where  $C_s$  = the criterion numeral;

$M$  = the volume of the machinery room, in  $m^3$ , with the addition thereto of the volume of any permanent oil fuel tanks which may be situated above the inner bottom and forward of or abaft the machinery room;

$P$  = the whole volume of the passenger spaces below the margin line, in  $m^3$ ;

$V$  = the whole volume of the ship below the margin line, in  $m^3$ ; and

$$P_1 = KN \quad (5.3.6.3.5.1-3)$$

where  $N$  = the number of passengers for which the ship shall be certified, and

$$K = 0,056L_1. \quad (5.3.6.3.5.1-4)$$

**5.3.6.3.5.2** When the value of  $KN$  is greater than the sum of  $P$  and the whole volume of the actual passenger spaces above the margin line, the figure to be taken as  $P_1$  is that sum or two-thirds  $KN$ , whichever is the greater.

**5.3.6.3.5.3** For ships not having a continuous bulkhead deck the volumes shall be taken up to the actual margin lines used in determining the floodable lengths.

**5.3.6.3.6** Rules for subdivision of ships other than those covered by 5.3.6.3.7.

**5.3.6.3.6.1** The subdivision abaft the forepeak of ships of  $L_1 \geq 131$  m having a criterion numeral of 23 or less shall be governed by the factor  $A$ ; of those having a criterion numeral of 123 or more by the factor  $B$ ; and of those having a criterion numeral between 23 and 123 by the factor  $F$  obtained by linear interpolation between the factors  $A$  and  $B$ , using the formula:

$$F = A - \frac{(A-B)(C_s-23)}{100}, \quad (5.3.6.3.6.1)$$

**5.3.6.3.6.2** Nevertheless, where the criterion numeral is equal to 45 or more and simultaneously the computed factor of subdivision  $F$  is 0,65 or less, but more than 0,5, the subdivision abaft the forepeak shall be governed by the factor 0,5.

**5.3.6.3.6.3** Where the factor  $F$  is less than 0,4 and it is shown to be impracticable to comply with the factor  $F$  in a machinery compartment of the ship, the subdivision of such compartment may be governed by an increased factor, which, however, shall not exceed 0,4.

**5.3.6.3.6.4** The subdivision abaft the forepeak of ships of  $79 \text{ m} \leq L_1 < 131$  m in length having a criterion numeral equal to  $S$  determined by the formula:

$$S = \frac{3,574-25L_1}{13}, \quad (5.3.6.3.6.4-1)$$

shall be governed by the factor unity. The subdivision of the ships having a criterion numeral of 123 or more shall be governed by the factor  $B$ . The subdivision of the passenger yachts having a criterion numeral between  $S$  and 123 shall be governed by the factor  $F$  obtained by linear interpolation between unity and the factor  $B$  using the formula:

$$F = 1 - \frac{(1-B)(C_s-S)}{123-S}, \quad (5.3.6.3.6.4-2)$$

**5.3.6.3.6.5** The subdivision abaft the forepeak of ships of  $79 \text{ m} \leq L_1 < 131$  m in length having a criterion numeral less than  $S$ , and of ships of  $L_1 < 79$  m in length shall be governed by the factor unity.

**5.3.6.3.6.6** The provisions of 5.3.6.3.6.5 shall apply also to ships of whatever length, which are certified to carry a number of passengers exceeding 12 but not exceeding:

$$\frac{L_1^2}{650} \text{ or } 36, \text{ whichever is less.} \quad (5.3.6.3.6.6)$$

**5.3.6.3.7** Special subdivision standards for ships complying with 3.1.1.2 of Part III "Equipment, Arrangements and Outfit".

**5.3.6.3.7.1** The subdivision abaft the forepeak shall be governed by a factor of 0,5 or by the factor determined according to 5.3.6.3.5 and 5.3.6.3.6, if less than 0,5.

**5.3.6.3.7.2** In the case of ships of  $L_z < 91,5$  m in length, if compliance with such factor would be impracticable in a compartment, the length of that compartment shall be governed by a higher factor provided the factor used is the lowest possible.

**5.3.6.3.7.3** The special provisions regarding permeability given in 5.3.6.2 shall be employed when calculating the floodable length curves.

**5.3.6.4** Special requirements concerning subdivision.

**5.3.6.4.1** Where in a portion or portions of a ship the watertight bulkheads are carried to a higher deck than in the remainder of the ship and it is desired to take advantage of this higher extension of the bulkheads in calculating the floodable length, separate margin lines may be used for each such portion of the ship provided that:

.1 the sides of the ship are extended throughout the ship's length to the deck corresponding to the upper margin line and all openings in the shell plating below this deck throughout the length of the ship are treated as being below a margin line; and

.2 the two compartments adjacent to the "step" in the bulkhead deck are each within the permissible length corresponding to their respective margin lines, and, in addition, their combined length does not exceed twice the permissible length based on the lower margin line.

**5.3.6.4.2** A compartment may exceed the permissible length determined in accordance with 5.3.6.3 provided the combined length of each pair of adjacent compartments to which the compartment in question is common does not exceed either the floodable length or twice the permissible length, whichever is the less.

**5.3.6.4.3** If one of the two adjacent compartments is situated inside the machinery room, and the second is situated outside the machinery room, and the average permeability of the portion of the ship in which the second is situated differs from that of the machinery room, the combined length of the two compartments shall be adjusted to the mean average permeability of the two portions of the ship in which the compartments are situated.

**5.3.6.4.4** Where the two adjacent compartments have different factors of subdivision, the combined length of the two compartments shall be determined proportionately.

**5.3.6.4.5** A main transverse bulkhead may be recessed provided that all parts of the recess lie inboard of vertical surfaces on both sides of the ship, situated at a distance from the shell plating equal to one fifth the breadth of the ship and measured at right angles to the centreline at the level of the deepest subdivision load line. Any part of a recess which lies outside these limits shall be dealt with as a step in accordance with 5.3.6.4.6.

**5.3.6.4.6** A main transverse bulkhead may be stepped provided that it meets one of the following conditions:

.1 the combined length of the two compartments, separated by the bulkhead in question, does not exceed either 90 % of the floodable length or twice the permissible length, except that, in ships having a factor of subdivision greater than 0,9, the combined length of the two compartments in question shall not exceed the permissible length;

.2 additional subdivision is provided in way of the step to maintain the same measure of safety as that secured by a plane bulkhead; and

.3 the compartment over which the step extends does not exceed the permissible length corresponding to a margin line taken 76 millimetres below the step.

**5.3.6.4.7** Where a main transverse bulkhead is recessed or stepped, an equivalent plane bulkhead shall be used in determining the subdivision.

**5.3.6.4.8** If the distance between two adjacent main transverse bulkheads, or their equivalent plane bulkheads, or the distance between the transverse planes passing through the nearest stepped portions of the bulkheads, is less than 3 metres plus 3 % of the length of the ship  $L_1$  or 11 metres, whichever is the less, only one of these bulkheads shall be regarded as forming part of the subdivision of the ship in accordance with the provisions of 5.3.6.3.

**5.3.6.4.9** Where a main transverse watertight compartment contains local subdivision and it can be shown to the satisfaction of the Register that, after any assumed side damage extending over a length of 3 m plus 3 % of the length of the ship  $L_1$ , or 11 m, whichever is the less, the whole volume of the main compartment shall not be flooded, a proportionate allowance may be made in the permissible length otherwise required for such compartment

and in such a case the volume of effective buoyancy assumed on the undamaged side shall not be greater than that assumed on the damaged side.

**5.3.6.4.10** Where the required factor of subdivision is 0,5 or less, the combined length of any two adjacent compartments shall not exceed the floodable length.

**5.3.6.5** Stability in damaged condition.

**5.3.6.5.1** Sufficient intact stability shall be provided in all service conditions so as to enable the ship to withstand the final stage of flooding of any one compartment which is required to be within the floodable length.

**5.3.6.5.2** Where two adjacent compartments are separated by a bulkhead which is stepped under the conditions specified in 5.3.6.4.6.2, the intact stability shall be adequate to withstand the flooding of those two adjacent compartments.

**5.3.6.5.3** Where the required factor of subdivision is 0,5 or less but more than 0,33 intact stability shall be adequate to withstand the flooding of any two adjacent compartments.

**5.3.6.5.4** Where the required factor of subdivision is 0,33 or less the intact stability shall be adequate to withstand the flooding of any three adjacent compartments.

**5.3.6.5.5** The requirements of 5.3.6.5.1 — 5.3.6.5.4 shall be determined by calculations which are in accordance with 5.3.6.5.10, 5.3.6.5.11 and 5.3.6.5.13 respectively and which take into consideration design characteristics of the ship and the arrangement and configuration of the damaged compartments and in making these calculations the ship shall be assumed in the worst anticipated service condition as regards stability.

**5.3.6.5.6** The stability required in the final condition after damage, and after equalization where provided, shall be such that the positive righting lever curve (flooding angle considered) shall have a minimum range of 15° beyond the angle of equilibrium provided that this range may be reduced to a minimum of 10°, in the case where the area under the righting lever curve is that specified in 5.3.6.5.7, increased by the ratio:

$$15/\text{range} \quad (5.3.6.5.6)$$

where the range is defined in 5.3.6.5.6, in degrees.

**5.3.6.5.7** The positive lever arm section shall be at least 0,015 m·rad, measured from the angle of equilibrium to the lesser of:

- .1 the angle at which progressive flooding occurs; or
- .2 22° (measured from 0 degrees) in the case of one-compartment flooding, or 27° (measured from 0 degrees) in the case of the simultaneous flooding of two or more adjacent compartments.

**5.3.6.5.8** The maximum lever arm within the said extent shall be obtained taking into account the greatest of the following heeling moments:

- .1 the crowding of all passengers towards one side;
  - .2 the launching of all fully loaded davit-launched lifeboats and liferafts on one side;
- and
- .3 due to wind pressure,  
as calculated by the formula:

$$GZ = (M_{heel}/Displacement) + 0,04 \quad (5.3.6.5.8.3)$$

provided that in no case is the righting lever to be less than 0,1 m.

**5.3.6.5.9** For the purpose of calculating the heeling moments in 5.3.6.5.8, the following assumptions shall be made:

- .1 moment due to crowding of passengers allowing:  
four persons per square metre;  
a mass of 75 kg for each passenger,  
and 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;
- .2 moments due to launching of all fully loaded davit-launched lifeboats and liferafts on one side shall be calculated under the following conditions:  
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;

for lifeboats which are arranged to be launched fully loaded from the stowed position, the maximum heeling moment during launching shall be taken;

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;

persons not in the life-saving appliances which are swung out shall not provide either additional heeling or righting moment;

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;

**.3** moments due to wind pressure where:

a wind pressure of 120 N/m<sup>2</sup> is to be applied;

the area applicable shall be the projected lateral area of the ship above the waterline corresponding to the intact condition; and

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 projected lateral area of the ship above the waterline;

**.4** 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° provided that in all cases, only one breach in the hull and only one free surface of sea water which penetrated after the accident need be assumed.

**5.3.6.5.10** For the purpose of making damage stability calculations the volume and surface permeabilities shall be in general as follows:

Table 5.3.6.5.10

Spaces	Permeability
Appropriated for stores	0,60
Occupied by accommodation	0,95
Occupied by machinery	0,85
Intended for liquids	0 or 0,95 <sup>1</sup>

<sup>1</sup> Whichever results in the more severe consequences.

provided that higher surface permeabilities shall be assumed in respect of spaces which, in the vicinity of the damage waterplane, contain no substantial quantity of accommodation or machinery and spaces which are not generally occupied by any substantial quantity of stores.

**5.3.6.5.11** The assumed extent of damage shall be as follows:

**.1** in the longitudinal extent, 3 m plus 3 % of the length  $L_1$  of the ship, or 11 m, whichever is the less, provided that where the required factor of subdivision is 0,33 or less the assumed longitudinal extent of damage shall be increased as necessary so as to include any two consecutive main transverse watertight bulkheads;

**.2** in the transverse extent, measured inboard from the ship's side, at right angles to the centreline at the level of the deepest subdivision load line, a distance of one fifth of the breadth of the ship  $B$ ; and

**.3** in the vertical extent: from the base line upwards without limit;

provided that if any damage of lesser extent than that indicated in this paragraph would result in a more severe condition regarding heel or loss of metacentric height, such damage shall be assumed in the damage trim and stability calculations.

**5.3.6.5.12** The following provisions apply with respect to unsymmetrical flooding:

**.1** such flooding shall be kept to a minimum consistent with efficient arrangements;

**.2** where it is necessary to correct large angles of heel, the means adopted shall, where practicable, be self-acting, but in any case where controls to cross-flooding fittings are provided they shall be operable from above the bulkhead deck;

**.3** cross-flooding fittings together with their controls shall be approved by the Register;

**.4** the maximum angle of heel after flooding but before equalization shall not exceed 15°;

**.5** where cross-flooding fittings are required the time for equalization shall not exceed 15 minutes; and

**.6** suitable information concerning the use of cross-flooding fittings shall be supplied to the master of the ship<sup>1</sup>.

<sup>1</sup> Refer to IMO resolution A.266(VIII).

**5.3.6.5.13** The final conditions of the ship after damage and, in the case of unsymmetrical flooding, after equalization measures have been taken shall be as follows:

**.1** in the case of symmetrical flooding there shall be a positive residual metacentric height of at least 0,05 m as calculated by the constant displacement method;

**.2** in the case of unsymmetrical flooding, the angle of heel for one-compartment flooding shall not exceed 7° and for the simultaneous flooding of two or more adjacent compartments, the angle of heel shall not exceed 12°; and

**.3** in no case shall the margin line be submerged in the final stage of flooding and if it is considered that the margin line may become submerged during an intermediate stage of flooding, the Register may require additional calculations and arrangements as it considers necessary for the safety of the ship."

13 **Existing paras 5.3.5 — 5.3.6.10** and references thereto are renumbered **5.3.7 — 5.3.8.10** accordingly.

14 **Para 5.10.1.1** is replaced by the following text:

**"5.10.1.1** The requirements of this Chapter, which are amendments and additions to the relevant requirements in Part XI "Electrical Equipment", apply to the electrical installations as well as to individual types of electrical equipment (in accordance with 5.10.3) of the yachts specified in 2.1, subject to the following.

Regardless of the nature of their use, for yachts carrying from 13 to 36 passengers, provisions in 19.1 of Part XI "Electrical Equipment" shall be additionally taken into account.

Yachts of 500 gross tonnage and over are subject to the full requirements of Part XI "Electrical Equipment".

15 **Para 5.10.9.1.1** is replaced by the following text:

**"5.10.9.1.1** Generators and/or accumulator batteries with a capacity sufficient to supply all electrical equipment of the vessel under conditions specified in 5.10.9.1.6 may be used as sources of electrical power for yachts."

16 **Para 5.10.10.1** is supplemented with a new paragraph reading as follows:

"The emergency source of electrical power for yachts carrying from 13 to 36 passengers shall also supply, for a period of 30 minutes, the supplementary lighting in all passenger cabins to clearly indicate the exit. The supplementary lights may be powered by their own accumulator batteries fitted in lighting fixtures and continuously recharged from the emergency switchboard."

17 **Para 5.10.10.4** is supplemented with a new paragraph reading as follows:

"For yachts carrying from 13 to 36 passengers, an emergency transitional source of electrical power, which shall start immediately on failure of the main source of electrical power, shall be provided irrespective of the time of starting of the emergency generator."

18 **New para 5.10.10.7** is introduced reading as follows:

**"5.10.10.7** For the emergency transitional source of electrical power required by 5.10.10.4, an accumulator battery shall be used, which shall operate without recharging and with voltage across its terminals within 12 % of rated voltage during the whole discharge period. Voltage variations across the terminals of the accumulator battery connected to an electronic voltage converter are determined by the permissible range of voltage variation across the terminals of the converter, which shall not be above values specified in 2.1.3.1 of Part XI "Electrical Equipment".

The capacity of the battery serving as transitional source of electrical power shall be sufficient for supplying the services listed below during 30 min:

**.1** lighting and necessary navigation lights according to 5.10.10.1 and 5.10.10.3;

**.2** internal communication and announcing systems required in an emergency;

- .3 general alarm system, fire detection and fire alarm system;
- .4 daylight signalling lamps, sound signal means (whistles, gongs, etc.) and other types of signals required under emergency conditions;
- .5 ship's security alarm system and AIS installation required by Part IV "Radio Equipment" and Part V "Navigational Equipment" of the Rules for the Equipment of Sea-Going Ships.

Services listed under 5.10.10.7.2 — 5.10.10.7.5 may be supplied from their own accumulator batteries which shall ensure their supply during the time necessary."

19 **Para 5.10.17.1** is replaced by the following text:

**"5.10.17.1** Vessels where a general alarm signal given by voice cannot be heard in all locations manned during voyage shall be provided with an electric general alarm system that ensures good audibility of signals in all places on board the vessel.

For yachts, carrying from 13 to 36 passengers, general alarm and fixed fire detection and fire alarm system shall comply with the requirements in 19.1.1.5 and 19.1.1.6 of Part XI "Electrical Equipment".

The internal communication shall, as a minimum, ensure compliance with the requirements specified in 3.3.1 of Part VII "Machinery Installations", taking into account the requirements in 6.5.1.2 of Part XIX "Additional Requirements for Cargo Ships of Less Than 500 Gross Tonnage". Measures shall be taken to ensure clear audibility, with the machinery at work."

20 **Para 5.14.1** is replaced by the following text:

**"5.14.1** The radio equipment for yachts covered by chapter IV of SOLAS 74, as amended, shall comply with the applicable requirements of chapter IV of SOLAS 74, as amended, taking into account 2.6."

21 **Para 5.14.2** is replaced by the following text:

**"5.14.2** The radio equipment for yachts not covered by chapter IV of SOLAS 74, as amended, shall comply with the applicable requirements of Part IV "Radio Equipment" of the Rules for the Equipment of Sea-Going Ships."

22 **Para 5.15.1** is replaced by the following text:

**"5.15.1** The navigational equipment for yachts covered by chapter V of SOLAS 74, as amended, shall comply with the applicable requirements of chapter V of SOLAS 74, as amended, taking into account 2.6."

23 **Para 5.15.2** is replaced by the following text:

**"5.15.2** The navigational equipment for yachts not covered by chapter V of SOLAS 74, as amended, shall comply with the applicable requirements of Part V "Navigational Equipment" of the Rules for the Equipment of Sea-Going Ships."