

Rules for the Classification of Inland Waterway Ships and for Conformity to Directive 2016/1629/EU as amended

Effective from 1 January 2023

Part F

Additional Class Notations

GENERAL CONDITIONS

Definitions:

“Administration” means the Government of the State whose flag the Ship is entitled to fly or under whose authority the Ship is authorised to operate in the specific case.

“IACS” means the International Association of Classification Societies.

“Interested Party” means the party, other than the Society, having an interest in or responsibility for the Ship, product, plant or system subject to classification or certification (such as the owner of the Ship and his representatives, the ship builder, the engine builder or the supplier of parts to be tested) who requests the Services or on whose behalf the Services are requested.

“Owner” means the registered owner, the ship owner, the manager or any other party with the responsibility, legally or contractually, to keep the ship seaworthy or in service, having particular regard to the provisions relating to the maintenance of class laid down in Part A, Chapter 2 of the Rules for the Classification of Ships or in the corresponding rules indicated in the specific Rules.

“Rules” in these General Conditions means the documents below issued by the Society:

- (i) Rules for the Classification of Ships or other special units;
- (ii) Complementary Rules containing the requirements for product, plant, system and other certification or containing the requirements for the assignment of additional class notations;
- (iii) Rules for the application of statutory rules, containing the rules to perform the duties delegated by Administrations;
- (iv) Guides to carry out particular activities connected with Services;
- (v) Any other technical document, as for example rule variations or interpretations.

“Services” means the activities described in Article 1 below, rendered by the Society upon request made by or on behalf of the Interested Party.

“Ship” means ships, boats, craft and other special units, as for example offshore structures, floating units and underwater craft.

“Society” or “TASNEEF” means Tasneef and/or all the companies in the Tasneef Group which provide the Services.

“Surveyor” means technical staff acting on behalf of the Society in performing the Services.

Article 1

1.1. The purpose of the Society is, among others, the classification and certification of ships and the certification of their parts and components. In particular, the Society:

- (i) sets forth and develops Rules;
- (ii) publishes the Register of Ships;
- (iii) issues certificates, statements and reports based on its survey activities.

1.2. The Society also takes part in the implementation of national and international rules and standards as delegated by various Governments.

1.3. The Society carries out technical assistance activities on request and provides special services outside the scope of classification, which are regulated by these general conditions, unless expressly excluded in the particular contract.

Article 2

2.1. The Rules developed by the Society reflect the level of its technical knowledge at the time they are published. Therefore, the Society, although committed also through its research and development services to continuous updating of the Rules, does not guarantee the Rules meet state-of-the-art science and technology at the time of publication or that they meet the Society's or others' subsequent technical developments.

2.2. The Interested Party is required to know the Rules on the basis of which the Services are provided. With particular reference to Classification Services, special attention is to be given to the Rules concerning class suspension, withdrawal and reinstatement. In case of doubt or inaccuracy, the Interested Party is to promptly contact the Society for clarification.

The Rules for Classification of Ships are published on the Society's website: www.tasneef.ae.

2.3. The Society exercises due care and skill:

- (i) in the selection of its Surveyors
- (ii) in the performance of its Services, taking into account the level of its technical knowledge at the time the Services are performed.

2.4. Surveys conducted by the Society include, but are not limited to, visual inspection and non-destructive testing. Unless otherwise required, surveys are conducted through sampling techniques and do not consist of comprehensive verification or monitoring of the Ship or of the items subject to certification. The surveys and checks made by the Society on board ship do not necessarily require the constant and continuous presence of the Surveyor. The Society may also commission laboratory testing, underwater inspection and other checks carried out by and under the responsibility of qualified service suppliers. Survey practices and procedures are selected by the Society based on its experience and knowledge and according to generally accepted technical standards in the sector.

Article 3

3.1. The class assigned to a Ship, like the reports, statements, certificates or any other document or information issued by the Society, reflects the opinion of the Society concerning compliance, at the time the Service is provided, of the Ship or product subject to certification, with the applicable Rules (given the intended use and within the relevant time frame).

The Society is under no obligation to make statements or provide information about elements or facts which are not part of the specific scope of the Service requested by the Interested Party or on its behalf.

3.2. No report, statement, notation on a plan, review, Certificate of Classification, document or information issued or given as part of the Services provided by the Society shall have any legal effect or implication other than a representation that, on the basis of the checks made by the Society, the Ship, structure, materials, equipment, machinery or any other item covered by such document or information meet the Rules. Any such document is issued solely for the use of the Society, its committees and clients or other duly authorised bodies and for no other purpose. Therefore, the Society cannot be held liable for any act made or document issued by other parties on the basis of the statements or information given by the Society. The validity, application, meaning and interpretation of a Certificate of Classification, or any other document or information issued by the Society in connection with its Services, is governed by the Rules of the Society, which is the sole subject entitled to make such interpretation. Any disagreement on technical matters between the Interested Party and the Surveyor in the carrying out of his functions shall be raised in writing as soon as possible with the Society, which will settle any divergence of opinion or dispute.

3.3. The classification of a Ship, or the issuance of a certificate or other document connected with classification or certification and in general with the performance of Services by the Society shall have the validity conferred upon it by the Rules of the Society at the time of the assignment of class or issuance of the certificate; in no case shall it amount to a statement or warranty of seaworthiness,

structural integrity, quality or fitness for a particular purpose or service of any Ship, structure, material, equipment or machinery inspected or tested by the Society.

3.4. Any document issued by the Society in relation to its activities reflects the condition of the Ship or the subject of certification or other activity at the time of the check.

3.5. The Rules, surveys and activities performed by the Society, reports, certificates and other documents issued by the Society are in no way intended to replace the duties and responsibilities of other parties such as Governments, designers, ship builders, manufacturers, repairers, suppliers, contractors or sub-contractors, Owners, operators, charterers, underwriters, sellers or intended buyers of a Ship or other product or system surveyed.

These documents and activities do not relieve such parties from any fulfilment, warranty, responsibility, duty or obligation (also of a contractual nature) expressed or implied or in any case incumbent on them, nor do they confer on such parties any right, claim or cause of action against the Society. With particular regard to the duties of the ship Owner, the Services undertaken by the Society do not relieve the Owner of his duty to ensure proper maintenance of the Ship and ensure seaworthiness at all times. Likewise, the Rules, surveys performed, reports, certificates and other documents issued by the Society are intended neither to guarantee the buyers of the Ship, its components or any other surveyed or certified item, nor to relieve the seller of the duties arising out of the law or the contract, regarding the quality, commercial value or characteristics of the item which is the subject of transaction.

In no case, therefore, shall the Society assume the obligations incumbent upon the above-mentioned parties, even when it is consulted in connection with matters not covered by its Rules or other documents.

In consideration of the above, the Interested Party undertakes to relieve and hold harmless the Society from any third party claim, as well as from any liability in relation to the latter concerning the Services rendered.

Insofar as they are not expressly provided for in these General Conditions, the duties and responsibilities of the Owner and Interested Parties with respect to the services rendered by the Society are described in the Rules applicable to the specific Service rendered.

Article 4

4.1. Any request for the Society's Services shall be submitted in writing and signed by or on behalf of the Interested Party. Such a request will be considered irrevocable as soon as received by the Society and shall entail acceptance by the applicant of all relevant requirements of the Rules, including these General Conditions. Upon acceptance of the written request by the Society, a contract between the Society and the Interested Party is entered into, which is regulated by the present General Conditions.

4.2. In consideration of the Services rendered by the Society, the Interested Party and the person requesting the service shall be jointly liable for the payment of the relevant fees, even if the service is not concluded for any cause not pertaining to the Society. In the latter case, the Society shall not be held liable for non-fulfilment or partial fulfilment of the Services requested. In the event of late payment, interest at the legal current rate increased by 1.5% may be demanded.

4.3. The contract for the classification of a Ship or for other Services may be terminated and any certificates revoked at the request of one of the parties, subject to at least 30 days' notice to be given in writing. Failure to pay, even in part, the fees due for Services carried out by the Society will entitle the Society to immediately terminate the contract and suspend the Services.

For every termination of the contract, the fees for the activities performed until the time of the termination shall be owed to the Society as well as the expenses incurred in view of activities already programmed; this is without prejudice to the right to compensation due to the Society as a consequence of the termination.

With particular reference to Ship classification and certification, unless decided otherwise by the Society, termination of the contract implies that the assignment of class to a Ship is withheld or, if already assigned, that it is suspended or withdrawn; any statutory certificates issued by the Society will be withdrawn in those cases where provided for by agreements between the Society and the flag State.

Article 5

5.1. In providing the Services, as well as other correlated information or advice, the Society, its Surveyors, servants or agents operate with due diligence for the proper execution of the activity. However, considering the nature of the activities performed (see art. 2.4), it is not possible to guarantee absolute accuracy, correctness and completeness of any information or advice supplied. Express and implied warranties are specifically disclaimed.

Therefore, except as provided for in paragraph 5.2 below, and also in the case of activities carried out by delegation of Governments, neither the Society nor any of its Surveyors will be liable for any loss, damage or expense of whatever nature sustained by any person, in tort or in contract, derived from carrying out the Services.

5.2. Notwithstanding the provisions in paragraph 5.1 above, should any user of the Society's Services prove that he has suffered a loss or damage due to any negligent act or omission of the Society, its Surveyors, servants or agents, then the Society will pay compensation to such person for his proved loss, up to, but not exceeding, five times the amount of the fees charged for the specific services, information or opinions from which the loss or damage derives or, if no fee has been charged, a maximum of AED5,000 (Arab Emirates Dirhams Five Thousand only). Where the fees charged are related to a number of Services, the amount of the fees will be apportioned for the purpose of the calculation of the maximum compensation, by reference to the estimated time involved in the performance of the Service from which the damage or loss derives. Any liability for indirect or consequential loss, damage or expense is specifically excluded. In any case, irrespective of the amount of the fees charged, the maximum damages payable by the Society will not be more than AED5,000,000 (Arab Emirates Dirhams Five Millions only). Payment of compensation under this paragraph will not entail any admission of responsibility and/or liability by the Society and will be made without prejudice to the disclaimer clause contained in paragraph 5.1 above.

5.3. Any claim for loss or damage of whatever nature by virtue of the provisions set forth herein shall be made to the Society in writing, within the shorter of the following periods: (i) THREE (3) MONTHS from the date on which the Services were performed, or (ii) THREE (3) MONTHS from the date on which the damage was discovered. Failure to comply with the above deadline will constitute an absolute bar to the pursuit of such a claim against the Society.

Article 6

6.1. These General Conditions shall be governed by and construed in accordance with United Arab Emirates (UAE) law, and any dispute arising from or in connection with the Rules or with the Services of the Society, including any issues concerning responsibility, liability or limitations of liability of the Society, shall be determined in accordance with UAE law. The courts of the Dubai International Financial Centre (DIFC) shall have exclusive jurisdiction in relation to any claim or dispute which may arise out of or in connection with the Rules or with the Services of the Society.

6.2. However,

- (i) In cases where neither the claim nor any counterclaim exceeds the sum of AED300,000 (Arab Emirates Dirhams Three Hundred Thousand) the dispute shall be referred to the jurisdiction of the DIFC Small Claims Tribunal; and
- (ii) for disputes concerning non-payment of the fees and/or expenses due to the Society for services, the Society shall have the

right to submit any claim to the jurisdiction of the Courts of the place where the registered or operating office of the Interested Party or of the applicant who requested the Service is located.

In the case of actions taken against the Society by a third party before a public Court, the Society shall also have the right to summon the Interested Party or the subject who requested the Service before that Court, in order to be relieved and held harmless according to art. 3.5 above.

Article 7

7.1. All plans, specifications, documents and information provided by, issued by, or made known to the Society, in connection with the performance of its Services, will be treated as confidential and will not be made available to any other party other than the Owner without authorisation of the Interested Party, except as provided for or required by any applicable international, European or domestic legislation, Charter or other IACS resolutions, or order from a competent authority. Information about the status and validity of class and statutory certificates, including transfers, changes, suspensions, withdrawals of class, recommendations/conditions of class, operating conditions or restrictions issued against classed ships and other related information, as may be required, may be published on the website or released by other means, without the prior consent of the Interested Party.

Information about the status and validity of other certificates and statements may also be published on the website or released by other means, without the prior consent of the Interested Party.

7.2. Notwithstanding the general duty of confidentiality owed by the Society to its clients in clause 7.1 above, the Society's clients hereby accept that the Society may participate in the IACS Early Warning System which requires each Classification Society to provide other involved Classification Societies with relevant technical information on serious hull structural and engineering systems failures, as defined in the IACS Early Warning System (but not including any drawings relating to the ship which may be the specific property of another party), to enable such useful information to be shared and used to facilitate the proper working of the IACS Early Warning System. The Society will provide its clients with written details of such information sent to the involved Classification Societies.

7.3. In the event of transfer of class, addition of a second class or withdrawal from a double/dual class, the Interested Party undertakes to provide or to permit the Society to provide the other Classification Society with all building plans and drawings, certificates, documents and information relevant to the classed unit, including its history file, as the other Classification Society may require for the purpose of classification in compliance with the applicable legislation and relative IACS Procedure. It is the Owner's duty to ensure that, whenever required, the consent of the builder is obtained with regard to the provision of plans and drawings to the new Society, either by way of appropriate stipulation in the building contract or by other agreement.

In the event that the ownership of the ship, product or system subject to certification is transferred to a new subject, the latter shall have the right to access all pertinent drawings, specifications, documents or information issued by the Society or which has come to the knowledge of the Society while carrying out its Services, even if related to a period prior to transfer of ownership.

Article 8

8.1. Should any part of these General Conditions be declared invalid, this will not affect the validity of the remaining provisions.

Part F
Additional Class Notations

Chapters **1 2 3 4 5**

CHAPTER 1	ADDITIONAL RULES FOR CARGO SHIPS
CHAPTER 2	FIRE PROTECTION REQUIREMENTS FOR PASSENGERS SHIPS CARRYING NOT MORE THAN OF 150 PASSENGERS
CHAPTER 3	FIRE PROTECTION REQUIREMENTS FOR PASSENGERS SHIPS CARRYING MORE THAN OF 150 PASSENGERS AND FOR RO-RO PASSENGER SHIPS.
CHAPTER 4	DAMAGE STABILITY REQUIREMENTS APPLYING TO PASSENGER SHIPS AND RO-RO PASSENGER SHIPS
CHAPTER 5	ADDITIONAL RULES FOR ALL TYPE OF SHIPS

CHAPTER 1

ADDITIONAL RULES FOR CARGO SHIPS

Section 1 Fire Protection Requirements

1	General	14
1.1	Application	
2	Structural fire protection for cargo ships with steel hulls	14
2.1	Ships having a length L more than 110 m	
2.2	Ships having a length L more than 50 m, but not greater than 110 m	
2.3	Ships having a length L more than 25 m, but not greater than 50 m	
2.4	Ships having a length L equal to or less than 25 m	
3	Requirements for oil tankers and other tankers carrying flammable liquids, chemical tankers and liquefied gas carriers	16
3.1		

CHAPTER 2

FIRE PROTECTION REQUIREMENTS FOR PASSENGER SHIPS CARRYING NOT MORE THAN OF 150 PASSENGERS

Section 1 Additional Requirements for Fire Protection of Passenger Ships carrying not more than 150 Passengers, and of High Speed Vessels

1	General	19
	1.1 Application	
2	Documentation to be submitted for approval	19
	2.1	
3	Materials	20
	3.1	
4	Fire integrity of bulkhead and decks	20
	4.1	
	4.2 Main internal subdivisions	
5	Means of escape	21
	5.1	
6	Ventilation system	21
	6.1	
7	Water fire-extinguishing system	21
	7.1	
8	Portable fire extinguisher	22
	8.1	
9	Fixed fire-extinguishing systems	22
	9.1	
10	Fire detection and alarm system	22
	10.1	
11	Alarm system	23
	11.1	
12	Internal communication facilities on board	23
	12.1	
13	Public address system	23
	13.1	
14	Watertight and fire door closure indicators	23
	14.1	

CHAPTER 3

FIRE PROTECTION REQUIREMENTS FOR PASSENGERS SHIPS CARRYING MORE THAN OF 150 PASSENGERS AND FOR RO-RO PASSENGERS SHIPS

Section 1 General

1	General	26
	1.1 Application	
2	Documentation to be submitted	26
	2.1	
	2.1 Type approved products	
3	Definitions	28
	3.1 Accommodation spaces	
	3.2 "A" class divisions	
	3.3 Administration	
	3.4 Atriums	
	3.5 "B" class divisions	
	3.6 Bulkhead deck	
	3.7 Cargo area	
	3.8 Cargo ship	
	3.9 Cargo spaces	
	3.10 Central control station	
	3.11 "C" class divisions	
	3.12 Chemical tanker	
	3.13 Closed ro-ro spaces	
	3.14 Closed vehicle spaces	
	3.15 Combination carrier	
	3.16 Combustible material	
	3.17 Continuous "B" class ceilings and linings	
	3.18 Continuously manned central control station	
	3.19 Control stations	
	3.20 Crude oil	
	3.21 Dangerous goods	
	3.22 Deadweight	
	3.23 Fire Test Procedures Code	
	3.24 Flashpoint	
	3.25 Gas carrier	
	3.26 Helideck	
	3.27 Helicopter facility	
	3.28 Lightweight	
	3.29 Low flame spread	
	3.30 Machinery space	
	3.31 Machinery spaces of category A	
	3.32 Main vertical zones	
	3.33 Non-combustible material	
	3.34 Oil fuel unit	
	3.35 Open ro-ro spaces	

- 3.36 Open vehicle spaces
- 3.37 Passenger ship
- 3.38 Public spaces
- 3.39 Rooms containing furniture and furnishings of restricted fire risk (only for the purpose of application of Section 2)
- 3.40 Ro-ro spaces
- 3.41 Ro-ro passenger ship
- 3.42 Steel or other equivalent material
- 3.43 Sauna
- 3.44 Service spaces
- 3.45 Special category spaces
- 3.46 Standard fire test
- 3.47 Tanker
- 3.48 Vehicle spaces
- 3.49 Weather deck

Section 2 Structural Fire Protection

1	Structure	33
1.1	Application	
2	Main vertical zones and horizontal zones	33
2.1	Bulkheads and decks forming boundaries of zones	
3	Bulkheads within a main vertical zone	33
3.1		
4	Fire integrity of bulkheads and decks	34
4.1		

Section 3 Means of Escape

1	Means of escape in passenger and crew spaces and in spaces in which the crew is normally employed, other than machinery spaces	38
1.1		
2	Means of escape in special category spaces	38
2.1		
3	Means of escape in machinery spaces	39
3.1		
4	Lifts	39
4.1		
5	Dimensions of means of escape of accommodation and service spaces and of control stations	39
5.1	General	
5.2	Calculation of the stairway widths	
5.3	Initial distribution of persons on board	
5.4	Additional notations	
5.5	Protection of stairways and lifts in accommodation and service spaces	

6	Openings in class divisions	41
	6.1	
7	Openings in B-class divisions	42
	7.1	

Section 4 Ventilation Systems

1	Penetrations of class A bulkheads or decks	46
	1.1	
2	Ducts provided for the ventilation of machinery spaces of category A, galleys, car deck spaces, ro-ro cargo spaces or special category spaces	46
	2.1	
3	Ducts provided for ventilation to accommodation spaces, service spaces or control stations	46
	3.1	
4	Penetrations of B-class divisions	47
	4.1	
5	Control stations outside machinery spaces	47
	5.1	
6	Galleys	47
	6.1	
7	Penetrations of main vertical zones	47
	7.1	
8	Closing from outside	47
	8.1	
9	Stopping of systems from outside	47
	9.1	
10	Fire test of arrangements	47
	10.1	

Section 5 Other Fire Safety Measures for Passenger Ships

1	Windows and sidescuttles	48
	1.1	
2	Restricted use of combustible materials	48
	2.1	

Section 6 Arrangements and Means for the Fire Protection of the Various Ship Spaces

1	Water fire-fighting system	49
	1.1	
2	Portable fire extinguishers	49
	2.1	
3	Fixed fire-extinguishing systems	50
	3.1	
4	Fire patrols, detection, alarms and public address systems	50
	4.1	
5	Firemen's outfits	50
	5.1	
6	Protection of special category spaces (and of similar partially open spaces)	51
	6.1 Provisions applicable to special category spaces whether above or below the bulkhead deck	
	6.2 Additional provisions applicable only to special category spaces above the bulkhead deck	
	6.3 Additional provisions applicable only to special category spaces below the bulkhead deck	
	6.4 Provisions applicable to partially open spaces	
	6.5 Permanent openings for ventilation	
7	Protection of cargo spaces, other than special category spaces, intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion	53
	7.1 Premise	
	7.2 Fire detection and fire alarm	
	7.3 Fire-extinguishing arrangements	
	7.4 Ventilation systems	
	7.5 Precautions against ignition of flammable vapours	
	7.6 Protection of open deck spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion	
	7.7 Permanent openings for ventilation	
	7.8 Structural protection	
8	Protection of closed and open ro-ro cargo spaces, other than special category spaces and ro-ro cargo spaces intended for the carriage of motor vehicles with fuel in their tanks	55
	8.1 General	
	8.2 Closed ro-ro cargo spaces	
	8.3 Open ro-ro cargo spaces	
9	Fixed fire-extinguishing arrangements in cargo spaces	55
	9.1 General	

Section 7 Arrangements for Oil Fuel, Lubricating Oil and Other Flammable Oils

1	General	56
	1.1	
2	Limitations in the use of oil as fuel	56
	2.1	
3	Oil fuel arrangements	56
	3.1	
4	Arrangements for lubricating oil	58
	4.1	
5	Arrangements for other flammable oils	58
	5.1	
6	Periodically unattended machinery spaces	58
	6.1	
7	Prohibition of carriage of flammable oils in the forepeak tank	59
	7.1	
8	Thermal oil installations	59
	8.1 General	
	8.2 Exhaust fired thermal oil heaters	

CHAPTER 4

DAMAGE STABILITY REQUIREMENTS APPLYING TO PASSENGER SHIPS AND RO-RO PASSENGER SHIPS

Section 1 Damage Stability for Passenger Ships

1	General	62
	1.1 Application	
2	Assumption	62
	2.1	
3	Damage stability criteria	63
	3.1	
4	Derogations for passenger vessels of length not greater than 25 m	64
	4.1	

Section 2 Damage Stability Requirements for Ships Carrying Dangerous Goods

1	Damage stability requirements for tankers carrying dangerous goods (Type C and Type N Tankers)	65
	1.1 Application	
	1.2 Stability (damaged condition)	
2	Damage stability requirements for tankers carrying dangerous liquefied gasses (Type G Tankers)	66
	2.1 General	
3	Damage stability requirements for cargo ships carrying dry dangerous goods	66
	3.1 General	
	3.2 Stability (damaged condition)	

Section 3 Damage Stability Requirements for Cargo Ships Longer than 110 Metres

1	General	69
	1.1 Damage stability criteria	

CHAPTER 5

ADDITIONAL RULES FOR ALL TYPE OF SHIPS

Section 1 Shaft Monitoring (Mon-Shaft)

1	General	72
1.1	Applicability of MON-SHAFT notation	
2	Requirements for the issuance of the notation	72
2.1	Arrangement	
2.2	Lubricating oil analysis	

Section 2 In-Water Survey Arrangements (Inwatersurvey)

1	General	73
1.1	Application	
1.2	Documentation to be submitted	
2	Structure design principles	73
2.1		

Part F
Additional Class Notations

Chapter 1
ADDITIONAL RULES FOR CARGO SHIPS

SECTION 1 FIRE PROTECTION REQUIREMENTS

SECTION 1

FIRE PROTECTION REQUIREMENTS

1 General

1.1 Application

1.1.1 When ^{Tasneef} carries out surveys relevant to fire protection, the requirements given in Pt C, Ch 3, Sec 1 and Sec 2 for ships carrying dangerous goods also apply.

1.1.2 For tankers, reference is to be made to [3].

1.1.3 In addition, for structural fire protection reference is to be made to [2].

1.1.4 For ships carrying dangerous goods, the additional fire protection requirements given in Pt E, Ch 2 apply.

1.1.5 For ro-ro cargo ships the requirements for cargo ships less than 4000 GT, given in the Rules for Fire Protection, Detection and Extinction for the Issue of Statutory Certificates other than SOLAS Certificates, are to be applied.

1.1.6 Ships with hulls in material different from steel are to comply with the specific requirements given in the Rules for the Classification of Ships with Hulls in GRP, Wood and Aluminium Alloy.

1.1.7 Cargo ships complying with the requirements of this Section are eligible for the assignment of the additional class notation FP.

2 Structural fire protection for cargo ships with steel hulls

2.1 Ships having a length L more than 110 m

2.1.1 The hull, superstructure, structural bulkheads, decks and deckhouses are to be constructed of steel, except where ^{Tasneef} may sanction the use of other suitable material (such as aluminium alloy) in special cases, bearing in mind the risk of fire, if this material is insulated in such a way that the structure cannot collapse in the event of fire.

2.1.2 As far as compatible with the size of the ship, boundaries separating spaces of the following categories are generally to be made of steel or other equivalent material meeting the requirement of at least "A-0" class: accommodation spaces, machinery spaces, control stations, cargo spaces, service spaces with a high fire risk and any spaces intended for the carriage of motor vehicles.

2.1.3 In accommodation spaces, the corridor bulkheads are to be of steel or constructed of "B" class panels. If these bulkheads are of steel, the face exposed to the corridor is, as a rule, to be bare or lined with non-combustible material; it may, however, be lined with combustible material provided that the plate is insulated in such a way as to obtain a

"B-15" class bulkhead. In any case the ceilings in the corridors, including their supports, are to be of non-combustible material.

2.1.4 When "A" class divisions are penetrated for the passage of electrical cables, pipes, ducts, etc. or are pierced by the fitting of stringers, beams and other similar structures or vent outlets, lighting apparatus and other similar apparatus, such penetrations are to be tested in accordance with the Fire Test Procedures Code. In the case of ventilation ducts, [2.1.14] to [2.1.16] apply. However, where a pipe penetration is made of steel or equivalent material having a thickness of 3 mm or greater and a length of not less than 900 mm (preferably 450 mm on each side of the division), and no openings, testing is not required. Such penetrations are to be suitably insulated by extension of the insulation at the same level as the division.

2.1.5 When "B" class divisions are penetrated for the passage of electrical cables, pipes, trunks, ducts, etc., or for the fitting of ventilation terminals, lighting fixtures and similar devices, arrangements are to be made to ensure that the fire resistance is not impaired, subject to the provisions of [2.1.16] c). Pipes other than steel or copper that penetrate "B" class divisions are to be protected by either:

a) a fire tested penetration device, suitable for the fire resistance of the division pierced and the type of pipe used; or
b) a steel sleeve, having a thickness of not less than 1,8 mm and a length of not less than 900 mm for pipe diameters of 150 mm or more and not less than 600 mm for pipe diameters of less than 150 mm (preferably equally divided on each side of the division). The pipes are to be connected to the ends of the sleeve by flanges or couplings, or the clearance between the sleeve and the pipe is to not exceed 2,5 mm, or any clearance between pipe and sleeve is to be made tight by means of non-combustible or other suitable material.

2.1.6 Uninsulated metallic pipes penetrating "A" or "B" class divisions are to be of materials having a melting temperature which exceeds 950°C for "A-0" and 850°C for "B-0" class divisions.

2.1.7 Deck coverings within accommodation spaces on the decks forming the crown of machinery and cargo spaces are to be of a type which does not readily ignite.

2.1.8 Interior stairways and associated supports are to be of steel or other material deemed suitable by ^{Tasneef} Crew lift trunks within accommodation spaces are to be of steel or equivalent material.

2.1.9 Bulkheads of galleys, paint stores, lamp rooms, boat-swain's stores when adjacent to accommodation spaces and emergency generator rooms, if any, are to be of steel or equivalent material. The face of these bulkheads external to

such spaces (and also the internal face for spaces containing emergency generators or similar) is, as a rule, to be bare or lined with non-combustible material; it may, however, be lined with combustible material provided that the plate is insulated in such a way as to obtain an "A-60" class bulkhead. For the boundaries of cargo spaces intended for the carriage of motor vehicles with fuel (gasoline, LPG or methane) in their tanks for their own propulsion, see [2.11.3] and [2.11.4].

2.1.10 In accommodation and machinery spaces, paints, varnishes and similar preparations having a nitro-cellulose or other highly flammable base are to not be used.

2.1.11 Pipes conveying oil or combustible liquids are to be of a material approved by ^{Tasneef} having regard to the fire risk. Materials readily rendered ineffective by heat are to not be used for overboard scuppers, sanitary discharges and other outlets which are close to the waterline and where the failure of the material in the event of fire would give rise to danger of flooding.

2.1.12 Power ventilation of machinery spaces is to be capable of being stopped from an easily accessible position outside the machinery spaces. Air inlets and outlets to the open are to be provided with draught stop devices; draught stops are to be made of non-combustible material.

2.1.13 The surfaces of the insulation on interior boundaries of spaces where penetration of oil products may occur are to be impervious to oil and oil vapours.

2.1.14 Ventilation ducts are to be of non-combustible material. However, short ducts, generally not exceeding 2 m in length and with a free cross-sectional area not exceeding 0,02 m², need not be non-combustible subject to the following conditions:

- a) the ducts are made of a material which has low flame spread characteristics;
- b) the ducts are only used at the end of the ventilation device;
- c) the ducts are not situated less than 600 mm, measured along the duct, from an opening in an "A" or "B" class division including continuous "B" class ceiling;
- d) fire dampers are made of steel of 3 mm thickness.

2.1.15 Ducts provided for ventilation of machinery spaces of category A and closed ro-ro spaces are generally not to pass through accommodation and service spaces or control stations; however, ^{Tasneef} may permit relaxation of this requirement provided that:

- a) the ducts are constructed of steel and each is insulated to "A-60" class; or
- b) the ducts are constructed of steel, are fitted with an automatic fire damper close to the boundary penetrated and are insulated to "A-60" class from the machinery space of category A or closed ro-ro space to a point at least 5 m beyond the fire damper;
- c) ducts provided for ventilation of accommodation and service spaces or control stations are generally not to pass through machinery spaces of category A and closed ro-ro spaces; however, ^{Tasneef} may permit relaxation of this requirement provided that ducts are constructed of steel

and an automatic fire damper is fitted close to the boundaries penetrated.

2.1.16 Where a thin plated duct with a free cross-sectional area equal to or less than 0,02 m² passes through "A" class bulkheads or decks, the openings are to be lined with a steel sheet sleeve having a thickness of at least 3 mm and a length of at least 200 mm, divided preferably into 100 mm on each side of the bulkhead or, in the case of the deck, wholly laid on the lower side of the decks pierced. Where ventilation ducts with a free cross-sectional area exceeding 0,02 m² pass through "A" class bulkheads or decks, the openings are to be lined with a steel sheet sleeve. However, where such ducts are of steel construction and pass through a deck or bulkhead, the ducts and sleeves are to comply with the following:

- a) The sleeves are to have a thickness of at least 3 mm and a length of at least 900 mm. When passing through bulkheads, this length is to be divided preferably into 450 mm on each side of the bulkhead. These ducts, or sleeves lining such ducts, are to be provided with fire insulation. The insulation is to have at least the same fire integrity as the bulkhead or deck through which the duct passes;
- b) Ducts with a free cross-sectional area exceeding 0,075 m² are to be fitted with fire dampers in addition to the requirements of item a). The fire dampers are to operate automatically, but are to also be capable of being closed manually from both sides of the bulkhead or deck. The dampers are to be provided with an indicator which shows whether they are open or closed. Fire dampers are not required, however, where ducts pass through spaces surrounded by "A" class divisions, without serving those spaces, provided those ducts have the same fire integrity as the divisions which they pierce. Fire dampers are to be easily accessible. Where they are placed behind ceilings or linings, these ceilings or linings are to be provided with an inspection door on which a plate reporting the identification number of the fire damper is provided. The fire damper identification numbers are to also be placed on any remote controls required.
- c) Ventilation ducts with a free cross-sectional area exceeding 0,02 m² passing through "B" class bulkheads are to be lined with steel sheet sleeves of 900 mm in length, divided preferably into 450 mm on each side of the bulkheads, unless the duct is of steel for this length.

2.1.17 Where they pass through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges are to be constructed of "A" class divisions.

Each exhaust duct is to be fitted with:

- 1) a grease trap readily removable for cleaning;
- 2) a fire damper located in the lower end of the duct;
- 3) arrangements, operable from within the galley, for shutting off the exhaust fans; and
- 4) fixed means for extinguishing a fire within the duct.

2.2 Ships having a length L more than 50 m, but not greater than 110 m

2.2.1 Cargo ships having a length L more than 50 m, but not greater than 110 m, are to comply with the requirements of [2.1], except for the provisions in [2.2.2].

2.2.2 For ships having a length L more than 50 m, but not greater than 110 m, accommodation spaces (even partially) under the decks extending through the whole breadth of the ship are to comply with the requirements given in [2.1.3]. For other accommodation spaces, the requirements of [2.1.3] may be limited to dead corridors and to those which represent an escapeway from the above-mentioned spaces underneath. In accommodation spaces not complying with the requirements of [2.1.3], the stairway spaces are to be enclosed by suitable draught-cutting trunks.

2.3 Ships having a length L more than 25 m, but not greater than 50 m

2.3.1 Cargo ships having having a length L more than 25 m, but not greater than 50 m, are to comply with the requirements of [2.1], except for the provisions in [2.3.2].

2.3.2 For ships having a length L more than 25 m, but not greater than 50 m, the requirements in [2.1.3] need to be applied only to lengths of corridor which represent the only escapeway from spaces inside the ship towards open deck areas from which it is possible to reach the life-saving appliances. In accommodation spaces not complying with the requirements of [2.1.3], the stairway spaces are to be enclosed by suitable draught-cutting trunks.

2.4 Ships having a length L equal to or less than 25 m

2.4.1 Cargo ships having a length L equal to or less than 25 m are to comply with the requirements of [2.1], except for the provisions stated in [2.1.2] and [2.1.3], which may be waived.

3 Requirements for oil tankers and other tankers carrying flammable liquids, chemical tankers and liquefied gas carriers

3.1

3.1.1 Reference is to be made to Sec 3, [3.1] of the Rules for Fire Protection, Detection and Extinction for the Issue of Statutory Certificates other than SOLAS Certificates.

3.1.2 In any case, the provisions referred to in [3.1.1] are to be applied when these Rules do not give specific requirements for ships carrying the products mentioned in [3].

Part F
Additional Class Notations

Chapter 2

FIRE PROTECTION REQUIREMENTS FOR PASSENGER SHIPS CARRYING NOT MORE THAN OF 150 PASSENGERS

SECTION 1 ADDITIONAL REQUIREMENTS FOR THE FIRE PROTECTION TO APPLY FOR PASSENGER SHIPS CARRYING NOT MORE THAN OF 150 PASSENGERS, AND FOR HIGH-SPEED-VESSEL

SECTION 1

ADDITIONAL REQUIREMENTS FOR FIRE PROTECTION OF PASSENGER SHIPS CARRYING NOT MORE THAN 150 PASSENGERS, AND OF HIGH SPEED VESSELS

1 General

1.1 Application

1.1.1 The requirements given in this Section are applicable to passenger ships with hulls built in steel or equivalent material, carrying not more than 150 passengers.

1.1.2 (1/3/2019)

For high speed vessels carrying passengers, ^{Tasneef} applies specific Rules for the classification of high-speed craft taking into account the requirements of Ch.29 ES-TRIN 2017/1.

1.1.3 For day trip passenger ships with hulls built in combustible material, carrying not more than 150 passengers, the requirements given in this Section apply, with the exception of the provisions in [4], which are to be replaced by the requirements given in Pt C, Ch 2, Sec 2 [9] of the

Rules for the Classification of Ships with Reinforced Plastic, Aluminium Alloy or Wooden Hulls.

1.1.4 Where specific requirements are not given in this Section, in any case reference is to be made to Pt C, Ch3, Sec 1.

1.1.5 Passenger ships complying with the requirements of this Section are eligible for the assignment of the additional class notation FP(Pax.)

2 Documentation to be submitted for approval

2.1

2.1.1 The following documentation is to be submitted to ^{Tasneef}

Table 1 : Documentation to be submitted

N°.	I/A (1)	Document (2)
1	A	Structural fire protection, showing the method of construction and the purpose of the various spaces of the passenger ships
2	A	Natural and mechanical ventilation systems showing the penetrations in class divisions, location of dampers, means of closing, arrangements of air conditioning rooms
3	A	Means of escape
4	A	Automatic fire detection systems and manually operated call points
5	A	Location of fire pumps and fire mains (with indication of pump head and capacity), fire hydrants and fire hoses
6	A	Arrangement of fixed fire-extinguishing systems (2)
7	A	Fire-fighting mobile equipment and firemen's outfits
8	A	Electrical diagram of fixed gas fire-extinguishing systems and fire pumps
9	A	Electrical diagram of power control and position indication circuits for fire doors
10	I	General arrangement plan
11	A	Sprinkler systems or equivalent systems, if any (2)
12	A	Electrical diagram of the sprinkler systems, if any

(1) A : to be submitted for approval in four copies
I : to be submitted for information, in duplicate.

(2) Plans are to be schematic and functional and to contain all information necessary for their correct interpretation and verification such as:

- service pressures
- capacity and head of pumps and compressors, if any
- materials and dimensions of piping and associated fittings
- volumes of protected spaces, for gas and foam fire-extinguishing systems
- surface areas of protected zones for automatic sprinkler and pressure water-spraying, low expansion foam and powder fire-extinguishing systems
- capacity, in volume and/or in mass, of vessels or bottles containing the extinguishing media or propelling gases, for gas, automatic sprinkler, foam and powder fire-extinguishing systems
- type, number and location of nozzles of extinguishing media for gas, automatic sprinkler, pressure water-spraying, foam and powder fire-extinguishing systems.

All or part of the information may be provided, instead of on the above plans, in suitable operation manuals or in specifications of the systems.

3 Materials

3.1

3.1.1 All insulation materials to be used for bulkheads, linings, ceilings and draught stops are to be at least approved non-combustible materials.

3.1.2 Primary deck coverings and surfaces within accommodation spaces are to be a type which will not readily ignite, or give rise to toxic or explosive hazards at elevated temperature. Reference is also to be made to the IMO FTP Code, ANNEX 1, Parts 2 and 6.

4 Fire integrity of bulkhead and decks

4.1

4.1.1

a) Where an automatic sprinkler system is not fitted, the following class divisions are to be provided:

- 1) Bulkheads between cabins are to be type approved "B-0" class division
- 2) Bulkheads between cabins and corridors are to be type approved "B-15" class division

b) Where an automatic sprinkler system complying with the provisions of Pt C, Ch 3, Sec 1, [10.2] is fitted, the following class divisions are to be provided:

- 1) Bulkheads between cabins are to be type approved B-0 class division
- 2) Bulkheads between cabins and corridors are to be type approved B-0 class division.

4.1.2 All corridor bulkheads are to extend from deck to deck except when continuous "B" class division ceiling is fitted on both sides of the bulkheads, where in which case the bulkhead may terminate at the continuous ceiling.

Interior stairways serving machinery spaces, service spaces, accommodation spaces and control stations are to be made of steel or other equivalent material.

4.1.3 A stairway is to be enclosed within enclosures formed of "B" class divisions with positive means of closure at all openings, except for an isolated stairway which penetrates a single deck only, in which case such stairway may be protected at one level only by an enclosure formed of a "B" class division and self-closing doors.

Doors are to have the same class division rating as the bulkhead where they are fitted.

4.1.4 Where "A" and "B" class divisions are penetrated for the passage of electrical cables, pipes, trunks, ducts etc., or for the fitting of ventilation terminals, lighting fixtures and similar devices, arrangements are to be made to ensure that the fire resistance is not impaired.

4.2 Main internal subdivisions

4.2.1 Longitudinally, the ship is to be divided by means of a main internal subdivision.

The length of such main internal subdivision may be extended to a maximum of 40 m in order for the ends of the internal subdivision to coincide with the watertight subdivision bulkheads.

Such main internal subdivisions are to be at least "A" class division.

Doors fitted on this subdivision are to be self-closing or are to be capable of remote release from the bridge and individually from both sides. The status of each fire door (open/closed position) is to be indicated on the bridge.

4.2.2 Galleys and control stations are to be enclosed by "A" class divisions.

4.2.3 Machinery spaces are to be separated from accommodation spaces by "A" class divisions. Doors fitted on this division are to have the same class division as the bulkhead where they are fitted and are to be self-closing and reasonably gas-tight.

4.2.4 Air spaces enclosed behind ceilings, panelling or linings are to be suitably divided by close-fitting draught stops not more than 14 m apart.

In the vertical direction, enclosed air spaces, including those behind linings of stairways, trunks etc., are to be closed at each deck level.

5 Means of escape

5.1

5.1.1 In general, two means of escape are to be provided from accommodation spaces.

Reference is to be made to [1.3.3]. In any case, only one of the two requested means of escape is to lead to a stairway from where the embarkation deck or the open deck may be reached.

6 Ventilation system

6.1

6.1.1 Ventilation ducts are to be of non-combustible material. Short ducts, however, not generally exceeding 2 m in length and with a cross-section not exceeding 0,02 m² need not be non-combustible provided that they have at least low flame characteristics.

6.1.2 Fire dampers are to be provided close to the boundaries penetrated. Such fire dampers are to be capable of being activated locally from both sides of the division.

7 Water fire-extinguishing system

7.1

7.1.1

a) A water fire-extinguishing system is to be provided consisting of:

- 1) two motor-driven fire-extinguishing pumps of sufficient capacity, at least one of which is permanently installed;
- 2) one fire extinguisher line with a sufficient number of hydrants with permanently connected fire hoses at least 20 m in length and fitted with a nozzle capable of producing both a mist and a jet of water and incorporating a shut-off facility.

b) Hydrant systems are to be designed and dimensioned in such a way that:

- 1) any point of the vessel can be reached from at least two hydrants in different places, each with a single hose length of not more than 20 m;
- 2) the pressure at the hydrants is at least 300 kPa; and
- 3) on all decks a water jet length of at least 6 m can be attained.

If a hydrant chest is provided, an 'extinguisher hose' suitability symbol, of at least 10 cm side length, is to be affixed to the outside of the chest.

c) Hydrant valves with screw threads or cocks are to be such that they can be set so that each of the fire hoses

can be separated and removed during operation of the fire-extinguishing pumps.

- d) Fire extinguisher hoses in the internal area are to be rolled up on an axially connected reel.
- e) Materials for fire-fighting equipment are either to be heat-resistant or to be suitably protected against failure to work when subjected to high temperatures.
- f) Pipes and hydrants are to be arranged in such a way that the possibility of freezing is avoided.
- g) The fire-extinguishing pumps are to:
 - 1) be installed or housed in separate rooms;
 - 2) be such that they can be operated independently of each other;
 - 3) each be capable, on all decks, of maintaining the necessary pressure at the hydrants and achieving the requisite length of water jet;
 - 4) be installed forward of the aft bulkhead.

Fire-extinguishing pumps may also be used for general purposes.

8 Portable fire extinguisher

8.1

8.1.1 (1/3/2019)

- a) There is to be at least one portable fire extinguisher in accordance with European Standard EN 3:2006 or equivalent standard at each of the following places:
 - 1) in the wheelhouse;
 - 2) close to each entrance from the deck to accommodation spaces;
 - 3) close to each entrance to service spaces which are not accessible from the accommodation spaces and which contain heating, cooking or refrigeration equipment using solid or liquid fuels or liquefied gas;
 - 4) at each entrance to engine rooms and boiler rooms;
 - 5) at suitable points below deck in engine rooms and boiler rooms such that no position in the space is more than 10 metres walking distance from an extinguisher.
- b) For the portable fire extinguishers required by paragraph i), only powder type extinguishers with a content of at least 6 kg or other portable fire extinguishers with the same extinguishing capacity may be used. They are to be suitable for class A, B and C fires and for fires in electrical systems of up to 1000 V.
- c) In addition, powder, water or foam fire extinguishers may be used which are suitable at least for the class of fire most likely to occur in the room for which they are intended.
- d) Portable fire extinguishers with CO₂ as the extinguishing agent may be used only for extinguishing fires in galleys and electrical installations. The content of these fire

extinguishers is to be no more than 1 kg per 15 m³ of the room in which they are made available for use.

- e) Portable fire extinguishers are to be checked at least every two years.
- f) In addition to the above portable extinguishers, at least the following are to be available on board:
 - 1) one portable extinguisher for every 120 m² of gross floor area in passenger areas;
 - 2) one portable extinguisher per group of 10 cabins, rounded upwards;
 - 3) one portable extinguisher in each galley and in the vicinity of any room in which flammable liquids are stored or used. In galleys the extinguishing agent is also to be suitable for fighting fat fires.

These additional fire extinguishers are to meet the requirements laid down in the above paragraph ii), and be installed and distributed on the vessel so that, in the event of a fire starting at any point and at any time, a fire extinguisher can be reached immediately. In every galley and also in hair-dressing salons and perfumeries, there is to be a fire blanket to hand.

9 Fixed fire-extinguishing systems

9.1

9.1.1 A fixed fire-extinguishing system is to be provided for machinery spaces containing internal combustion engines used for propulsion and oil fired boilers. Such systems are to be in conformity with the requirements stated in Pt C, Ch 3, Sec 1.

9.1.2 Where installed, automatic pressure water-spraying systems for the passenger area are to be ready for operation at all times when passengers are on board. No additional measures on the part of crew must be needed to actuate the system.

10 Fire detection and alarm system

10.1

10.1.1 Day rooms normally accessible to passengers and crew, galleys and machinery spaces are to be fitted with a fire detection system capable of detecting a fire in the space of origin and providing an alarm for safe escape and fire-fighting activity. Such system is to be installed in accordance with the requirements of the IMO Fire Safety Systems Code, Chapter 9.

10.1.2 When an automatic pressure water-spraying system designed according to the requirements of Part C is provided, it is not necessary to fit the above system in addition. In any case manually operated call points are to be fitted in the following spaces:

- Passageways, enclosed stairways and at lifts
- Saloons, day rooms and dining rooms
- Machinery spaces, galleys and spaces with a similar fire risk.

The manually operated call points are to be placed not more than 10 m apart; however, at least one call point is to be available in every watertight compartment.

The alarm set off by a manual call point is to be transmitted only to the spaces attended by the crew or officers.

11 Alarm system

11.1

11.1.1 The ship is to be equipped with an alarm system. The system is to include:

- a) an alarm enabling passengers, crew members and ship-board personnel to alert the vessel's command and crew.

This alarm is to be given only in areas assigned to the vessel's command and to the crew; it is only to be possible for the vessel's command to stop the alarm. The alarm is to be capable of being triggered from at least the following places:

- 1) in each cabin;
- 2) in the corridors, lifts and stairwells, with the distance to the nearest trigger not exceeding 10 m and with at least one trigger per watertight compartment;
- 3) in accommodation spaces, dining rooms and similar recreation rooms;
- 4) in toilets intended for use by persons with reduced mobility;
- 5) in engine rooms, galleys and similar rooms where there is a fire risk;
- 6) in cold storage rooms and other storerooms.

The alarm triggers are to be installed at a height above the floor of 0,85 m to 1,10 m;

- b) an alarm enabling the vessel's command to alert passengers.

This alarm is to be clearly and unmistakably audible in all rooms accessible to passengers. It is to be capable of being triggered from the wheelhouse and from a location that is permanently staffed;

- c) an alarm enabling the vessel's command to alert the crew and shipboard personnel.

11.1.2 This alarm is to enable the accommodation spaces, engine rooms and, where appropriate, separate pump rooms to be reached.

It is also to reach the recreation rooms for shipboard personnel, cold storage rooms and other storerooms.

The helmsman is to have within reach an on/off switch controlling the alarm signal; switches which automatically return to the "off" position when released are not acceptable.

The sound pressure level for the alarm signal is to be at least 75 dB(A) within the accommodation area.

In engine rooms and pump rooms the alarm signal is to take the form of a flashing light that is visible on all sides and clearly perceptible at all points.

Alarm triggers are to be protected against unintentional use.

12 Internal communication facilities on board

12.1

12.1.1 Where no direct means of communication exists between the bridge and:

- a) the bow of the ship
- b) the stern of the ship
- c) the crew accommodation
- d) service spaces
- e) the engine room control station,

suitable internal communication facilities are to be provided.

Reception at all positions of these internal communication links is to be via loudspeaker, and transmission is to be via a fixed microphone. The link with the bow and stern of the ship may be of the radio-telephone type.

13 Public address system

13.1

13.1.1 Passenger ships are to be provided with a loudspeaker system. The system is to be designed in such a way as to ensure that the information transmitted can be clearly distinguished from background noise. Loudspeakers are not necessary where direct communication is possible between the wheelhouse and the passenger area.

14 Watertight and fire door closure indicators

14.1

14.1.1 Adequate indicators are to be fitted on the control panel showing the status of such doors.

**FIRE PROTECTION REQUIREMENTS FOR
PASSENGERS SHIPS CARRYING MORE
THAN OF 150 PASSENGERS AND FOR
RO-RO PASSENGERS SHIPS**

- SECTION 1 GENERAL**
- SECTION 2 STRUCTURAL FIRE PROTECTION**
- SECTION 3 MEANS OF ESCAPE**
- SECTION 4 VENTILATION SYSTEMS**
- SECTION 5 OTHER FIRE SAFETY MEASURES FOR PASSENGER SHIPS**
- SECTION 6 ARRANGEMENTS AND MEANS FOR THE FIRE PROTECTION OF
THE VARIOUS SHIP SPACES**
- SECTION 7 ARRANGEMENTS FOR OIL FUEL, LUBRICATING OIL AND OTHER
FLAMMABLE OILS**

SECTION 1

GENERAL

1 General

1.1 Application

1.1.1 The requirements given in this Section are applicable to passenger vessels with hulls built in steel or equivalent material, carrying more than 150 passengers.

1.1.2 The requirements given in this Section are also applicable to ro-ro passenger ships considering the relevant additional requirements.

1.1.3 At the request of the Interested Parties, the requirements given in this Section may also be applied to passenger ships carrying not more than 150 passengers.

1.1.4 Passenger ships complying with the requirements of this Section are eligible for the assignment of the additional class notation EFP(Pax).

2 Documentation to be submitted

2.1

2.1.1 The following documentation is to be submitted to Tasneef

Table 1 : Documentation to be submitted

N°.	I/A (1)	Document (2)
1	A	Structural fire protection, showing the method of construction and the purpose of the various spaces of the passenger ships
2	A	Natural and mechanical ventilation systems showing the penetrations in class divisions, location of dampers, means of closing, arrangements of air conditioning rooms
3	A	Means of escape
4	A	Automatic fire detection systems and manually operated call points
5	A	Location of fire pumps and fire mains (with indication of pump head and capacity), fire hydrants and fire hoses
6	A	Arrangement of fixed fire-extinguishing systems (2)
7	A	Fire-fighting mobile equipment and firemen's outfits
8	A	Electrical diagram of fixed gas fire-extinguishing systems and fire pumps
9	A	Electrical diagram of power control and position indication circuits for fire doors
10	I	General arrangement plan
11	A	Sprinkler systems or equivalent systems, if any (2)
12	A	Electrical diagram of the sprinkler systems, if any

(1) A : to be submitted for approval in four copies

I : to be submitted for information, in duplicate.

(2) Plans are to be schematic and functional and to contain all information necessary for their correct interpretation and verification such as:

- service pressures
- capacity and head of pumps and compressors, if any
- materials and dimensions of piping and associated fittings
- volumes of protected spaces, for gas and foam fire-extinguishing systems
- surface areas of protected zones for automatic sprinkler and pressure water-spraying, low expansion foam and powder fire-extinguishing systems
- capacity, in volume and/or in mass, of vessels or bottles containing the extinguishing media or propelling gases, for gas, automatic sprinkler, foam and powder fire-extinguishing systems
- type, number and location of nozzles of extinguishing media for gas, automatic sprinkler, pressure water-spraying, foam and powder fire-extinguishing systems.

All or part of the information may be provided, instead of on the above plans, in suitable operation manuals or in specifications of the systems.

2.1 Type approved products

2.1.1 The following materials, equipment, systems or products in general used for fire protection are to be type approved by *Tasneef* except for special cases for which the acceptance may be given for individual ships on the basis of suitable documentation or ad hoc tests:

- | | |
|---|--|
| <ul style="list-style-type: none"> a) fire-resisting and fire-retarding divisions (bulkheads or decks) and associated doors; b) upholstered furniture, excluding the frame; c) materials for oil or fuel oil pipes (where they are not of steel or copper and its alloys); | <ul style="list-style-type: none"> d) materials for pipes penetrating "A" or "B" class divisions; (where they are not of steel or other equivalent material); e) bulkhead or deck penetrations for electrical cables passing through "A" or "B" class divisions; f) materials with low flame spread characteristics, including paints, varnishes and similar, when they are required to have such characteristic; g) non-combustible materials; h) textile and non-textile materials suspended vertically, for example curtains; i) non-readily igniting materials for primary deck coverings; |
|---|--|

- j) fixed foam fire-extinguishing systems and associated foam-forming liquids;
- k) fixed powder fire-extinguishing systems, including the powder;
- l) flexible pipes and expansion bellows of both metallic and non-conventional material for any type of fluid;
- m) sprinkler heads for automatic sprinkler systems;
- n) nozzles for fixed pressure water-spraying fire-extinguishing systems for machinery spaces, boiler rooms and spaces intended for the carriage of vehicles;
- o) sensing heads for automatic fire alarm and fire detection systems;
- p) fixed fire detection and fire alarm systems;
- q) explosive mixture detecting systems;
- r) portable explosive mixture detecting apparatus;
- s) fixed instruments for measuring the oxygen content for inert gas systems serving cargo tanks;
- t) portable instruments for measuring the oxygen content; for inert gas systems serving cargo tanks;
- u) portable fire extinguishers;
- v) large capacity fire extinguishers;
- w) extinguishing media substitute for the foam in fire extinguishers;
- x) fire protective overalls;
- y) breathing apparatus;
- z) smoke helmets and smoke masks;
- aa) electric safety lamps;
- ab) lifelines;
- ac) fire hoses;
- ad) water fog applicators and nozzles, including dual-purpose nozzles, for fire hoses;
- ae) fire dampers;
- af) emergency escape breathing devices;
- ag) portable foam applicators;
- ah) glass reinforced plastic grid platforms.

^{Tasneef} may request type approval for other materials, equipment, systems or products required by the applicable provisions for ships or installations of special types.

3 Definitions

3.1 Accommodation spaces

3.1.1 Accommodation spaces are those spaces used for public spaces, corridors, stairs, lavatories, cabins, offices, hospitals, cinemas, games and hobby rooms, barber shops, pantries containing no cooking appliances and similar spaces.

3.2 "A" class divisions

3.2.1 "A" class divisions are those divisions formed by bulkheads and decks which comply with the following criteria:

- a) they are constructed of steel or other equivalent material;
- b) they are suitably stiffened;
- c) they are insulated with approved non-combustible materials such that the average temperature of the unexposed side will not rise more than 140°C above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180°C above the original temperature, within the time listed below:
 - class "A-60"60 min;
 - class "A-30"30 min;
 - class "A-15".....15 min;
 - class "A-0".....0 min;
- d) they are so constructed as to be capable of preventing the passage of smoke and flame to the end of the one-hour standard fire test; and
- e) a test of a prototype bulkhead or deck in accordance with the "Fire Test Procedures Code" (see [3.23]) is conducted to ensure that it meets the above requirements for integrity or temperature rise.

The products indicated in Tab 2 may be installed without testing or approval.

3.3 Administration

3.3.1 The Administration is the Administration of the State whose flag the ship is entitled to fly.

3.4 Atriums

3.4.1 Atriums are public spaces within a single main vertical zone spanning three or more open decks.

3.5 "B" class divisions

3.5.1 "B" class divisions are those divisions formed by bulkheads, decks, ceilings or linings which comply with the following criteria:

- a) they are constructed of approved non-combustible materials and all materials entering into the construction and erection of "B" class divisions are non-combustible, with the exception that combustible veneers may be permitted provided they meet the other appropriate requirements of these Rules;
- b) they have an insulation value such that the average temperature of the unexposed side will not rise more than 140° C above the original temperature, nor will the temperature at any one point, including any joint, rise more

than 225° C above the original temperature, within the time listed below:

- class "B-15"15 min;
 - class "B-0"0 min;
- c) they are so constructed as to be capable of preventing the passage of flame to the end of the first half hour of the standard fire test;
- d) a test of a prototype division in accordance with the Fire Test Procedures Code (see [3.23]) is conducted to ensure that it meets the above requirements for integrity or temperature rise.

3.6 Bulkhead deck

3.6.1 The bulkhead deck is the uppermost deck up to which the transverse watertight bulkheads are carried.

3.7 Cargo area

3.7.1 The cargo area is that part of the ship that contains cargo holds, cargo tanks, slop tanks and cargo pump rooms including pump rooms, cofferdams, ballast and void spaces adjacent to cargo tanks and also deck areas throughout the entire length and breadth of the part of the ship over the above-mentioned spaces.

3.7.2 For the definition of the cargo area of chemical tankers (see [3.12]) and gas carriers (see [3.25]), refer to the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) and the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code), respectively.

3.8 Cargo ship

3.8.1 A cargo ship is any ship which is not a passenger ship.

Table 1

Classification	Product description
class "A-0" bulkhead	A steel bulkhead with dimensions not less than the minimum dimensions given below: <ul style="list-style-type: none"> • thickness of plating: 4 mm • stiffeners 60 x 60 x 5 mm spaced at 600 mm or structural equivalent
class "A-0" bulkhead	A steel deck with dimensions not less than the minimum dimensions given below: <ul style="list-style-type: none"> • thickness of plating: 4 mm; • stiffeners 95 x 65 x 7 mm spaced at 600 mm or structural equivalent

3.9 Cargo spaces

3.9.1 Cargo spaces are spaces used for cargo, cargo oil tanks, tanks for other liquid cargo and trunks to such spaces.

3.10 Central control station

3.10.1 A central control station is a control station in which the following control and indicator functions are centralised:

- a) fixed fire detection and alarm systems;
 - b) automatic sprinklers, fire detection and alarm systems;
 - c) fire door indicator panels;
 - d) fire door closures;
 - e) watertight door indicator panels;
 - f) watertight door closures;
 - g) ventilation fans;
 - h) general/fire alarms;
 - i) communication systems including telephones, and
- Note 1: The communication systems referred to are only those required by these Rules;
- j) microphones to the public address system.

3.11 "C" class divisions

3.11.1 "C" class divisions are constructed of approved non-combustible materials. They need meet neither requirements relative to the passage of smoke and flame nor limitations relative to the temperature rise. Combustible veneers are permitted provided they meet the requirements of these Rules.

3.12 Chemical tanker

3.12.1 A chemical tanker is a tanker constructed or adapted and used for the carriage in bulk of any liquid product of a flammable nature listed in Pt E, Ch 8, Sec 17 of the Rules for the Classification of Ships.

3.13 Closed ro-ro spaces

3.13.1 Closed ro-ro spaces are those ro-ro spaces which are neither open ro-ro spaces nor weather decks.

3.14 Closed vehicle spaces

3.14.1 Closed vehicle spaces are vehicle spaces which are neither open vehicle spaces nor weather decks.

3.15 Combination carrier

3.15.1 A combination carrier is a cargo ship designed to carry both oil and solid cargoes in bulk.

3.16 Combustible material

3.16.1 Combustible material is any material other than a non-combustible material.

3.17 Continuous "B" class ceilings and linings

3.17.1 Continuous "B" class ceilings or linings are those "B" class ceilings or linings which terminate at an "A" or "B" class division.

3.18 Continuously manned central control station

3.18.1 A continuously manned central control station is a central control station which is continuously manned by a responsible member of the crew.

3.19 Control stations

3.19.1 Control stations are those spaces in which the ship's radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralised.

3.20 Crude oil

3.20.1 Crude oil is any oil occurring naturally in the earth, whether or not treated to render it suitable for transportation, and includes crude oil where certain distillate fractions may have been removed from, or added to.

3.21 Dangerous goods

3.21.1 Dangerous goods are those goods belonging to the following classes:

- class 1 - Explosives;
- class 2 - Gases: compressed, liquefied or dissolved under pressure;
- class 3 - Flammable liquids;
- class 4.1 - Flammable solids;
- class 4.2 - Substances liable to spontaneous combustion;
- class 4.3 - Substances which, in contact with water, emit flammable gases;
- class 5.1 - Oxidising substances;
- class 5.2 - Organic peroxides;
- class 6.1 - Poisonous (toxic) substances;
- class 6.2 - Infectious substances;
- class 7 - Radioactive materials;
- class 8 - Corrosives;
- class 9 - Miscellaneous dangerous substances (that is any other substance which experience has shown, or may show, to be of such a dangerous character that the provisions of Part A, Chapter VII of the SOLAS Convention are to be applied).

3.22 Deadweight

3.22.1 The deadweight is the difference in tonnes 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.

3.23 Fire Test Procedures Code

3.23.1 The "Fire Test Procedures Code" means the "International Code for Application of Fire Test Procedures", as adopted by the Maritime Safety Committee of IMO by Resolution MSC.61 (67), as may be amended by IMO.

3.24 Flashpoint

3.24.1 The flashpoint is the temperature in degrees Celsius (closed cup test) at which a product will give off enough flammable vapour to be ignited, as determined by an approved flashpoint apparatus.

3.25 Gas carrier

3.25.1 A gas carrier is a cargo ship constructed or adapted and used for the carriage in bulk of any liquefied gas or other products of a flammable nature listed in Pt E, Ch 9, Sec 19 of the Rules for the Classification of Ships.

3.26 Helideck

3.26.1 A helideck is a purpose-built helicopter landing area located on a ship, including all structure, fire-fighting appliances and other equipment necessary for the safe operation of helicopters.

3.27 Helicopter facility

3.27.1 A helicopter facility is a helideck including any refuelling and hangar facilities.

3.28 Lightweight

3.28.1 The lightweight is the displacement of a ship in tonnes without cargo, fuel, lubricating oil, ballast water, fresh water and feed water in tanks, consumable stores, and passengers and crew and their effects.

3.29 Low flame spread

3.29.1 Low flame spread means that the surface thus described will adequately restrict the spread of flame, this being determined in accordance with the "Fire Test Procedures Code".

3.29.2 Non-combustible materials are considered as low flame spread. However, due consideration will be given by ^{Tasneef} to the method of application and fixing.

3.30 Machinery space

3.30.1 Machinery spaces are machinery spaces of category A and other spaces containing propulsion machinery, boilers, fuel oil units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilising, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces.

3.31 Machinery spaces of category A

3.31.1 Machinery spaces of category A are those spaces and trunks to such spaces which contain either:

- internal combustion machinery used for main propulsion,
- internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW, or
- any oil fired boiler or oil fuel unit, or any oil fired equipment other than boilers, such as inert gas generators, incinerators, etc.

3.32 Main vertical zones

3.32.1 Main vertical zones are those sections into which the hull, superstructure and deckhouses are divided by "A" class divisions, the mean length and width of which on any deck do not generally exceed 40 m.

3.33 Non-combustible material

3.33.1 Non-combustible material is a material which neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750°C, this being determined in accordance with the "Fire Test Procedures Code".

3.33.2 In general, products made only of glass, concrete, ceramic products, natural stone, masonry units, common metals and metal alloys are considered as being non-combustible and may be installed without testing and approval.

3.34 Oil fuel unit

3.34.1 The oil fuel unit is the equipment used for the preparation of oil fuel for delivery to an oil fired boiler or equipment used for the preparation for delivery of heated oil to an internal combustion engine and includes any oil pressure pumps, filters and heaters dealing with oil at a pressure of more than 0,18 MPa.

3.34.2 "Oil fuel unit" includes any equipment used for the preparation and delivery of oil fuel, whether or not heated, to boilers (including inert gas generators) and engines (including gas turbines) at a pressure of more than 0,18 MPa.

Note 1: For the purpose of these Rules "oil fuel" has the same meaning of "fuel oil".

3.35 Open ro-ro spaces

3.35.1 Open ro-ro spaces are those ro-ro spaces that are either open at both ends or have an opening at one end, and are provided with adequate natural ventilation effective over their entire length through permanent openings distributed in the side plating or deckhead or from above, having a total area of at least 10% of the total area of the space sides.

3.36 Open vehicle spaces

3.36.1 Open vehicle spaces are those vehicle spaces that are either open at both ends, or have an opening at one end, and are provided with adequate natural ventilation effective over their entire length through permanent openings distributed in the side plating or deckhead or from above, having a total area of at least 10% of the total area of the space sides.

3.37 Passenger ship

3.37.1 A passenger ship is a ship which carries more than twelve passengers.

3.38 Public spaces

3.38.1 Public spaces are those portions of the accommodation which are used for halls, dining rooms, lounges and similar permanently enclosed spaces.

3.39 Rooms containing furniture and furnishings of restricted fire risk (only for the purpose of application of Section 2)

3.39.1 Rooms containing furniture and furnishings of restricted fire risk are those rooms (whether cabins, public spaces, offices or other types of accommodation) in which:

- a) case furniture such as desks, wardrobes, dressing tables, bureaux and dressers are constructed entirely of approved non-combustible materials, except that a combustible veneer not exceeding 2 mm may be used on the working surface of such articles;
- b) free-standing furniture such as chairs, sofas and tables are constructed with frames of non-combustible materials;
- c) draperies, curtains and other suspended textile materials have qualities of resistance to the propagation of flame not inferior to those of wool of mass 0,8 kg/m², this being determined in accordance with the Fire Test Procedures Code (see [3.23]);
- d) floor coverings have low flame spread characteristics;
- e) exposed surfaces of bulkheads, linings and ceilings have low flame spread characteristics;
- f) upholstered furniture has qualities of resistance to the ignition and propagation of flame, this being determined in accordance with the Fire Test Procedures Code (see [3.23]); and
- g) bedding components have qualities of resistance to the ignition and propagation of flame, this being determined in accordance with the Fire Test Procedures Code (see [3.23]).

3.40 Ro-ro spaces

3.40.1 Ro-ro spaces are spaces not normally subdivided in any way and extending for either a substantial length or the entire length of the ship, in which motor vehicles with fuel in their tanks for their own propulsion and/or goods (packaged or in bulk, in or on rail or road cars, vehicles (includ-

ing road or rail tankers), trailers, containers, pallets, demountable tanks or in or on similar stowage units or other receptacles) can be loaded and unloaded normally in a horizontal direction.

3.41 Ro-ro passenger ship

3.41.1 A ro-ro passenger ship means a passenger ship with ro-ro spaces or special category spaces as defined in [3.45].

3.42 Steel or other equivalent material

3.42.1 "Steel or other equivalent material" means any non-combustible material which, by itself or due to insulation provided, had structural and integrity properties equivalent to steel at the end of the applicable exposure to the standard fire test (e.g. aluminium alloy with appropriate insulation).

3.43 Sauna

3.43.1 A sauna is a hot room with temperatures normally varying between 80°-120°C where the heat is provided by a hot surface (e.g. by an electrically heated oven). The hot room may also include the space where the oven is located and adjacent bathrooms.

3.44 Service spaces

3.44.1 Service spaces are those spaces used for galleys, pantries containing cooking appliances, lockers, mail and specie rooms, storerooms, workshops other than those forming part of the machinery spaces, and similar spaces and trunks to such spaces.

3.44.2 Main pantries and pantries containing cooking appliances may contain:

- toasters, induction heaters, microwave ovens and similar appliances each of them with a maximum power of 5 kW;
- electrically heated cooking plates and hot plates for keeping food warm each of them with a maximum power of 2 kW and a surface temperature not above 150°C;
- water boilers, regardless of their electrical power;
- coffee automats, and non-cooking appliances such as dishwashers, water boilers, ice-cube machines and

fridges without any restriction on their power. A dining room containing such appliances is not to be regarded as a pantry.

3.44.3 Spaces containing any electrically heated cooking plate or hot plate for keeping food warm, with a power of more than 2 kW, or toasters, induction heaters, microwave ovens and similar appliances each of them with power greater than 5 kW are to be regarded as galleys.

3.45 Special category spaces

3.45.1 Special category spaces are those enclosed vehicle spaces above and below the bulkhead deck, into and from which vehicles can be driven and to which passengers have access. Special category spaces may be accommodated on more than one deck provided that the total overall clear height for vehicles does not exceed 10 m.

3.46 Standard fire test

3.46.1 A standard fire test is a test in which the specimens of the relevant bulkheads or decks are exposed in a test furnace to temperatures corresponding approximately to the standard time-temperature curve in accordance with the Fire Test Procedures Code (see [3.23]).

3.47 Tanker

3.47.1 A tanker is a cargo ship constructed or adapted for the carriage in bulk of liquid cargoes of a flammable nature.

3.48 Vehicle spaces

3.48.1 Vehicle spaces are cargo spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion.

3.49 Weather deck

3.49.1 A weather deck is a deck which is completely exposed to the weather from above and from at least two sides.

SECTION 2

STRUCTURAL FIRE PROTECTION

1 Structure

1.1 Application

1.1.1 The hull, superstructure, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material. For the purpose of applying the definition of steel or other equivalent material as given in Sec 1, the "applicable fire exposure" shall be according to the integrity and insulation standards given in Tables 1 to 2.

For example, where divisions such as decks or sides and ends of deckhouses are permitted to have B-0 fire integrity, the "applicable fire exposure" shall be half an hour.

1.1.2 However, in cases where any part of the structure is of aluminium alloy, the following shall apply:

- a) The insulation of aluminium alloy components of "A" or "B" class divisions, except structures which are non-load-bearing, shall be such that the temperature of the structural core does not rise more than 200°C above the ambient temperature at any time during the applicable fire exposure to the standard fire test.
- b) Special attention shall be given to the insulation of aluminium alloy components of columns, stanchions and other structural members required to support lifeboat and liferaft stowage, launching and embarkation areas, and "A" and "B" class divisions to ensure:
 - 1) that for such members supporting lifeboat and liferaft areas and "A" class divisions, the temperature rise limitation specified in the preceding item (a) shall apply at the end of one hour; and
 - 2) that for such members required to support "B" class divisions, the temperature rise limitation specified in the preceding item (a) shall apply at the end of half an hour.

1.1.3 Crowns and casings of machinery spaces of category A shall be of steel construction adequately insulated and openings therein, if any, shall be suitably arranged and protected to prevent the spread of fire.

2 Main vertical zones and horizontal zones

2.1 Bulkheads and decks forming boundaries of zones

2.1.1 The hull, superstructure and deckhouses in way of accommodation and service spaces shall be subdivided into main vertical zones by "A" class divisions.

These divisions shall have insulation values in accordance with Tables 1 and 2.

2.1.2 As far as practicable, bulkheads forming boundaries of main vertical zones above the bulkhead deck shall be in line with watertight subdivision bulkheads situated immediately below the bulkhead deck. The length and width of the main vertical zones may be extended to a maximum of 48 m in order to bring the ends of the main vertical zones to coincide with watertight subdivision bulkheads or in order to accommodate a large public space extending for the whole length of the main vertical zone provided that the total area of the main vertical zone is not greater than 1600 m² on any deck. The length or width of a main vertical zone is the maximum distance between the furthestmost points of the bulkheads bounding it.

2.1.3 Such bulkheads shall extend from deck to deck and to the shell or other boundaries.

2.1.4 Where a main vertical zone is subdivided by horizontal "A" class divisions into horizontal zones for the purpose of providing an appropriate barrier between sprinklered and non-sprinklered zones of the ship, the divisions shall extend between adjacent main vertical zone bulkheads and to the shell or exterior boundaries of the ship and shall be insulated in accordance with the fire insulation and integrity values given in Table 2.

2.1.5

- a) On ships designed for special purposes, such as automobile or railroad car ferries, where the provision of main vertical zone bulkheads would defeat the purpose for which the ship is intended, equivalent means for controlling and limiting a fire shall be substituted and specifically approved by Tasneef
- b) However, in a ship with special category spaces, any such space shall comply with the applicable provisions of Sec 6,[6] and, in so far as such compliance would be inconsistent with compliance with other requirements of this Section, Sec 3 and Sec 6, the requirements of Sec 6,[6] shall prevail.

3 Bulkheads within a main vertical zone

3.1

3.1.1

- a) All bulkheads within accommodation and service spaces which are not required to be "A" class divisions

shall be at least "B" class or "C" class divisions as prescribed in Table 1.

- b) All such divisions may be faced with combustible materials in accordance with the provisions of Sec 6,[6].

Where not required to be "A" class, all corridor bulkheads shall be "B" class divisions which shall extend from deck to deck except:

3.1.2

- a) when continuous "B" class ceilings or linings are fitted on both sides of the bulkhead, the portion of the bulkhead behind the continuous ceiling or lining shall be of material which, in thickness and composition, is acceptable in the construction of "B" class division but which shall be required to meet "B" class integrity standards only in so far as is reasonable and practicable in the opinion of ^{Tasneef}
- b) in the case of a ship protected by an automatic sprinkler system complying with the provisions of Pt C, Ch 3, Sec 1,[10.2], the corridor bulkheads of "B" class materials may terminate at a ceiling in the corridor provided such ceiling is of material which, in thickness and composition, is acceptable in the construction of "B" class divisions. Notwithstanding the requirements in Tables 1 and 2, such bulkheads and ceilings shall be required to meet "B" class integrity standards only in so far as is reasonable and practicable in the opinion of ^{Tasneef} All doors and frames in such bulkheads shall be of non-combustible materials and shall be so constructed and erected as to provide substantial fire resistance to the satisfaction of ^{Tasneef}

3.1.3 All bulkheads required to be "B" class divisions, except corridor bulkheads prescribed in [3.1.2], shall extend from deck to deck and to the shell or other boundaries unless continuous "B" class ceilings or linings are fitted on both sides of the bulkhead, in which case the bulkhead may terminate at the continuous ceiling or lining.

If a "B-15" class ceiling is discontinued by an air gap between two bulkheads of adjacent cabins, such bulkheads are to be of "B-15" class.

4 Fire integrity of bulkheads and decks

4.1

4.1.1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this Section, the minimum fire integrity of bulkheads and decks shall be as prescribed in Tables 1 and 2.

4.1.2 The following requirements shall govern application of the tables:

- a) Tables 1 and 2 shall apply, respectively, to bulkheads and decks separating adjacent spaces.
- b) For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) below. The title of each category is intended to be typical rather than restrictive.

The number in parentheses preceding each category refers to the applicable column or row in Tables 1 and 2.

- 1) Control stations
 - Spaces containing emergency sources of power and lighting.
 - Wheelhouse and chartroom.
 - Spaces containing the ship's radio equipment.
 - Fire-extinguishing rooms, fire control rooms and fire-recording stations.
 - Control room for propulsion machinery when located outside the machinery space.
 - Spaces containing centralised fire alarm equipment.
 - 2) Corridors
 - Passenger and crew corridors and lobbies.
 - 3) Accommodation spaces
 - Spaces as defined in Sec. 1, [3.1], excluding corridors.
 - 4) Stairways
 - Interior stairways, lifts and escalators (other than those wholly contained within machinery spaces) and enclosures thereto. In this connection, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.
 - 5) Service spaces (low risk)
 - Lockers and storerooms not having provision for the storage of flammable liquids and having areas less than 4 m², and drying rooms and laundries.
 - 6) Machinery spaces of category A
 - Spaces as defined in Sec 1, [3.31].
 - 7) Other machinery spaces
 - Spaces as defined in Sec 1, [3.30], excluding machinery spaces of category A.
 - 8) Cargo spaces
 - Spaces as defined in Sec 1, [3.9]. All spaces used for cargo (including cargo oil tanks) and trunkways and hatchways to such spaces, other than special category spaces.
 - 9) Service spaces (high risk)
 - Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and storerooms having areas of 4 m² or more, spaces for the storage of flammable liquids, and workshops other than those forming part of machinery spaces.
 - 10) Open decks
 - Open deck spaces and enclosed promenades having no fire risk. Air spaces (the space outside superstructures and deckhouses).
 - 11) Special category spaces
 - Spaces as defined in Sec 1, [3.45].
- c) In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is not protected by an automatic sprinkler system complying with the provisions of Ch 2, Sec 1 [7.1.1] or between such zones nei-

ther of which is so protected, the higher of the two values given in the tables applies.

- d) In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is protected by an automatic sprinkler system complying with the provisions of Pt C, Ch 3, Sec 1 or between such zones both of which are so protected, the lesser of the two values given in the tables applies.

Where a sprinklered zone and a non-sprinklered zone meet within accommodation and service spaces, the higher of the two values given in the tables applies to the division between the zones.

4.1.3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

4.1.4 External boundaries which are required in [1.1.1] to be of steel or other equivalent material may be pierced for

the fitting of windows and sidescuttles provided that there is no requirement for such boundaries to have "A" class integrity elsewhere in this Chapter. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be of materials to the satisfaction of ^{Tasneef}

4.1.5 As far as applicable, the following requirements shall be complied with.

- a) When an insulated fire division intersects a non-insulated deck or bulkhead, the insulation shall be extended or turned up, as the case may be, beyond the intersection line for a width a not less than 400 mm in the case of divisions of main vertical zones or horizontal zones, and not less than 300 mm in the case of other divisions whether of "A" or "B" class (see Fig 1).
- b) When an insulated fire division intersects another insulated fire division, the insulation in way of the intersection shall be turned up for at least 300 mm on the non-insulated side of the division.

Figure 1

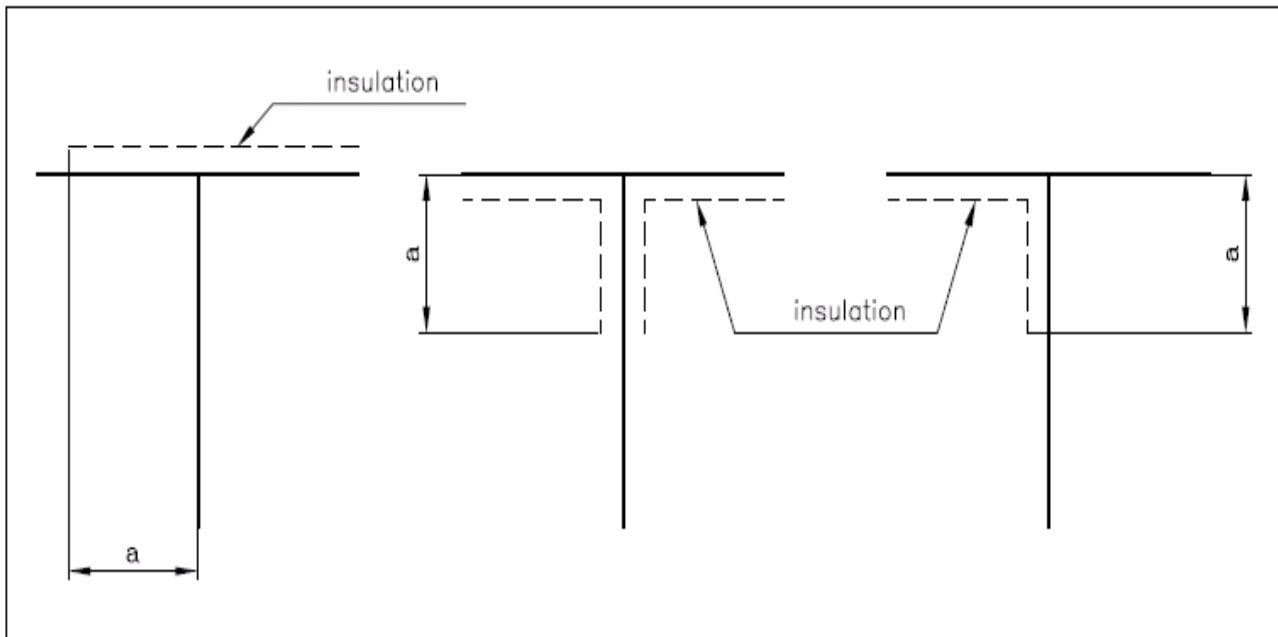


Table 1 : Fire integrity of bulkheads separating adjacent spaces

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0 (c)	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*	A-60
Corridors (2)		C (e)	B-0 (e)	A-0 (a) B-0 (e)	B-0 (e)	A-60	A-0	A-0	A-15 A-0 (d)	*	A-15
Accommodation spaces (3)			C (e)	A-0 (a) B-0 (e)	B-0 (e)	A-60	A-0	A-0	A-15 A-0 (d)	*	A-30 A-0 (d)
Stairways (4)				A-0 (a) B-0 (e)	A-0 (a) B-0 (e)	A-60	A-0	A-0	A-15 A-0 (d)	**	A-15
Service spaces (low risk) (5)					C (e)	A-60	A-0	A-0	A-0	*	A-60
Machinery spaces of category A (6)						*	A-0	A-0	A-60	*	A-60
Other machinery spaces (7)							A-0 (b)	A-0	A-0	*	A-0
Cargo spaces (8)								*	A-0	*	A-0
Service spaces (high risk) (9)									A-0 (b)	*	A-30
Open decks (10)										*	A-0
Special category spaces (11)											A-0

Note 1:

- a) For clarification as to which applies, see [1.1.3].
- b) Where spaces are of the same numerical category and superscript (b) appears, a bulkhead or deck of the ratings shown in the table is only required when the adjacent spaces are for a different purpose, e.g. in category (9).
A galley next to another galley does not require a bulkhead but a galley next to a paint room requires an A-0 bulkhead.
- c) Bulkheads separating the wheelhouse and chartroom from each other may be B-0 rating.
- d) See items c) and d) of [4.1.2].
- e) For the application of item [2.1.2] and C, where appearing in this table, shall be read as A-0.
- f) Fire insulation need not be fitted in machinery spaces of category (7) which, in the opinion of ^{Tasneef} have little or no fire risk.
- * Where an asterisk appears in the table, the division is required to be of steel or other equivalent material but is not required to be of "A" class standard.
- ** For the application of item [2.1.2] except for categories (8) and (10), shall be read as A-0.

Table 2 : Fire integrity of decks separating adjacent spaces

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations (1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*	A-30
Corridors (2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30 A-0 (d)
Accommodation spaces (3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30 A-0 (d)
Stairways (4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*	A-0
Service spaces (low risk) (5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A (6)	A-60	A-60	A-60	A-60	A-60	*	A-60 (f)	A-30	A-60	*	A-60
Other machinery spaces (7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*	A-0
Cargo spaces (8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*	A-0
Service spaces (high risk) (9)	A-60	A-30 A-0 (d)	A-30 A-0 (d)	A-30 A-0 (d)	A-0	A-60	A-0	A-0	A-0	*	A-30
Open decks (10)	*	*	*	*	*	*	*	*	*	-	A-0
Special category spaces (11)	A-60	A-15	A-30 A-0 (d)	A-15	A-0	A-30	A-0	A-0	A-30	A-0	A-0

Note 1:

- a) For clarification as to which applies, see [1.1.3].
- b) Where spaces are of the same numerical category and superscript (b) appears, a bulkhead or deck of the ratings shown in the table is only required when the adjacent spaces are for a different purpose, e.g. in category (9).
A galley next to another galley does not require a bulkhead but a galley next to a paint room requires an A-0 bulkhead.
- c) Bulkheads separating the wheelhouse and chartroom from each other may be B-0 rating.
- d) See items c) and d) of [4.1.2].
- e) For the application of item [2.1.2] and C, where appearing in this table, shall be read as A-0.
- f) Fire insulation need not be fitted in machinery spaces of category (7) which, in the opinion of ^{Tasneef} have little or no fire risk.
- * Where an asterisk appears in the Table, the division is required to be of steel or other equivalent material but is not required to be of "A" class standard.
- ** For the application of item [2.1.2] except for categories (8) and (10), shall be read as A-0.

SECTION 3

MEANS OF ESCAPE

1 Means of escape in passenger and crew spaces and in spaces in which the crew is normally employed, other than machinery spaces

1.1

1.1.1 Stairways and ladders shall be arranged to provide ready means of escape to the lifeboat and liferaft embarkation deck from all passenger and crew spaces and from spaces in which the crew is normally employed, other than machinery spaces. In particular, the following provisions shall be complied with:

- a) Below the bulkhead deck two means of escape, at least one of which shall be independent of watertight doors, shall be provided from each watertight compartment or similarly restricted space or group of spaces. Exceptionally, ^{Tasneef} may dispense with one of these means of escape, due regard being paid to the nature and location of spaces and to the number of persons who might normally be accommodated there.
- b) Above the bulkhead deck there shall be at least two means of escape from each main vertical zone or similarly restricted space or group of spaces at least one of which shall give access to a stairway forming a vertical escape.
- c) If a radiotelegraph station has no direct access to the open deck, two means of escape from or access to such station shall be provided, one of which may be a porthole or window of sufficient size or another suitable means.
- d) A corridor, lobby, or part of corridor from which there is only one route of escape shall be prohibited.
- e) At least one of the means of escape required by the preceding items (a) and (b) shall consist of a readily accessible enclosed stairway, which shall provide continuous fire shelter from the level of its origin to the appropriate lifeboat and liferaft embarkation decks, or to the uppermost weather deck if the embarkation deck does not extend to the main vertical zone being considered. In the latter case, direct access to the embarkation deck by way of external open stairways and passageways shall be provided and shall have emergency lighting in accordance with Regulation III/11.5 of Chapter III of the SOLAS Convention and slip-free surfaces under foot. Boundaries facing external open stairways and passageways forming part of an escape route and boundaries in such a position that their failure during a fire would impede escape to the embarkation deck shall have fire integrity, including insulation values, in accordance with Tables 1 and 2 of Section 1.
- f) Protection of access from the stairway enclosures to the lifeboat and liferaft embarkation areas shall be to the satisfaction of ^{Tasneef}
- g) Stairways serving only one space and a balcony in that space shall not be considered as forming one of the required means of escape.
- h) Where public spaces span three or more decks and contain combustibles such as furniture and enclosed spaces such as shops, offices and restaurants, each level within the space shall have two means of escape, one of which shall give direct access to an enclosed vertical means of escape meeting the requirements of (e) above.
- i) Where ^{Tasneef} has granted dispensation under the provisions of (a) above, this sole means of escape shall provide safe escape.
- j) In addition to the emergency lighting required by Regulations II-1/42 and III/11.5 of the SOLAS Convention, the means of escape, including stairways and exits, shall be marked by lighting of photoluminescent strip indicators placed not more than 0,3 m above the deck at all points of the escape route including angles and intersections. The marking must enable passengers to identify all the routes of escape and readily identify the escape exit. If electric illumination is used, it shall be supplied by the emergency source of power and it shall be so arranged that the failure of any single light or cut in a lighting strip will not result in the marking being ineffective. Additionally, all escape route signs and fire equipment location markings shall be of photoluminescent material or marked by lighting. The lighting or photoluminescent equipment is to be tested and shall be such that it is considered suitable by ^{Tasneef} furthermore, such equipment is to be applied in accordance with the Guidelines of IMO Regulation A.752(18) or other procedure considered suitable by ^{Tasneef}
- k) the minimum width of corridors, doors and escape stairways in way of accommodation and service spaces and control stations shall be no less than 650 mm;
- l) spaces below the bulkhead deck having gross deck area of 50 m² or less may have only one means of escape.

2 Means of escape in special category spaces

2.1

2.1.1

- a) In special category spaces the number and disposition of the means of escape both below and above the bulkhead deck shall be to the satisfaction of ^{Tasneef} and in general the safety of access to the embarkation deck

shall be at least equivalent to that provided for in (a), (b), (e) and (f) of [1.1.1] above.

- b) One of the escape routes from machinery spaces where the crew is normally employed shall avoid direct access to any special category space.

3 Means of escape in machinery spaces

3.1

3.1.1 Two means of escape shall be provided from each machinery space.

- a) Where the space is below the bulkhead deck, the two means of escape shall consist of either:
- 1) two sets of steel ladders as widely separated as possible, leading to doors in the upper part of the space similarly separated and from which access is provided to the appropriate lifeboat and liferaft embarkation decks; or
 - 2) one steel ladder leading to a door in the upper part of the space from which access is provided to the embarkation deck and additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the embarkation deck.
- b) Where the space is above the bulkhead deck, the two means of escape shall be as widely separated as possible and the doors leading from such means of escape shall be in a position from which access is provided to the appropriate lifeboat and liferaft embarkation decks. Where such means of escape require the use of ladders, these shall be of steel.

3.1.2 In a ship of less than 1000 gross tonnage, ^{Tasneef} may dispense with one of the means of escape, due regard being paid to the width and disposition of the upper part of the space; and in a ship of 1000 gross tonnage and above, ^{Tasneef} may dispense with one means of escape from any such space so long as either a door or a steel ladder provides a safe escape route to the embarkation deck, due regard being paid to the nature and location of the space and whether persons are normally employed in that space.

3.1.3 Two means of escape shall be provided from a machinery control room located within a machinery space, at least one of which shall provide continuous fire shelter to a safe position outside the machinery space.

3.1.4 Two means of escape shall be provided from a machinery control room located within a machinery space, at least one of which will provide continuous fire shelter to a safe position outside the machinery space.

4 Lifts

4.1

4.1.1 In no case shall lifts be considered as forming one of the required means of escape.

5 Dimensions of means of escape of accommodation and service spaces and of control stations

5.1 General

5.1.1 It should be recognised that the evacuation routes to the embarkation deck may include a muster station. In this case consideration shall be given to the fire protection requirements and sizing of corridors and doors from the stairway enclosure to the muster station and from the muster station to the embarkation deck using these guidelines noting that evacuation of persons from muster stations to embarkation positions will be carried out in small controlled groups.

5.1.2 It is the intention that the calculation method shall consider evacuation from enclosed spaces within each main vertical zone individually and take into account all of the persons using the stairway enclosures in each zone even if they enter that stairway from another main vertical zone.

5.1.3 For each main vertical zone the calculation shall be completed for the night time (case 1) and day time (case 2) and the largest dimension from either case used for determining the stairway width for each deck under consideration.

5.1.4 The calculation method determines the stairway width at each deck level taking into account the three consecutive stairways leading into the stairway under consideration.

5.2 Calculation of the stairway widths

5.2.1 In considering the design of stairway widths for each individual case which allow for the timely flow of persons evacuating to the muster stations from adjacent decks above and below, the following calculation method shall be used (see Fig 1 and Fig 2):

- when joining two decks:
 $W = (N_1 + N_2) \times 10 \text{ mm}$
- when joining three decks:
 $W = (N_1 + N_2 + 0,5N_3) \times 10 \text{ mm}$
- when joining four decks:
 $W = (N_1 + N_2 + 0,5N_3 + 0,25N_4) \times 10 \text{ mm}$

When joining five or more decks, the width of the stairways should be determined by applying the above formula for four decks to the deck under consideration and to the consecutive decks, where:

W : the required tread width between handrails of the stairway.

The calculated value of W may be reduced where available landing area S is provided in stairways at the deck level defined by subtracting P from Z , such that:

$$P = S \times 3,0 \text{ persons} / \text{m}^2$$

$$P_{\max} = 0,25 Z$$

where:

- Z : the total number of persons expected to be evacuated on the deck being considered;
- P : the number of persons taking temporary refuge on the stairway landing, which may be subtracted from Z to a maximum value of $P = 0,25Z$ (to be rounded down to the nearest whole number);
- S : the surface area (m^2 of the landing, minus the surface area necessary for the opening of doors and minus the surface area necessary for accessing the flow on stairs (see Fig 1);
- S : the total number of persons expected to use the stairway from each consecutive deck under consideration; N_1 is for the deck with the largest number of persons using that stairway; N_2 is taken for the deck with the next highest number of persons directly entering the stairway flow such that when sizing the stairway width at each deck level, $N_1 > N_2 > N_3 > N_4$ (see Fig 2). These decks are assumed to be on or upstream of (i.e. away from the embarkation deck) the deck being considered.

5.2.2 The stairway shall not decrease in width in the direction of evacuation to the muster station, and in the case of several muster stations in one main vertical zone the stairway width shall not decrease in the direction of evacuation to the most distant muster station.

5.2.3 Where the passengers and crew are held at a muster station which is not at the survival craft embarkation position, the dimensions of stairway width and doors from the muster station to this position shall be based on the number of persons in the controlled groups. The width of these stairways and doors need not exceed "B" class 00 mm unless larger dimensions are required for evacuation of these spaces under normal conditions.

5.3 Initial distribution of persons on board

5.3.1 The calculations of stairway widths shall be based upon the crew and passenger load on each deck. Occupant loads shall be as rated by the Designer for passenger and crew accommodation spaces, service spaces, control spaces and machinery spaces. For the purpose of the calculation, the maximum capacity of a public space shall be defined by either of the following values:

the number of seats or similar arrangements,

or the number obtained by assigning 2 m^2 of gross deck surface area to each person.

5.3.2 The dimensions of the means of escape shall be calculated on the basis of the total number of persons expected to escape by the stairway and through doorways, corridors and landings "B" class (see Figure 3). Calculations shall be

made separately for the two cases of occupancy of the spaces specified below. For each component part of the escape route, the dimension taken shall not be less than the larger dimension determined for each case:

- Case 1 Passengers in cabins with maximum berthing capacity fully occupied; members of the crew in cabins occupied to 2/3 of maximum berthing capacity; and service spaces occupied by 1/3 of the crew.
- Case 2 Passengers in public spaces occupied to 3/4 of maximum capacity; members of the crew in public spaces occupied to 1/3 of maximum capacity; service spaces occupied by 1/3 of the crew; and crew accommodation occupied by 1/3 of the crew.

5.3.3 The maximum number of persons contained in a vertical zone, including persons entering stairways from another main vertical zone, shall not be assumed to be higher than the maximum number of persons authorised to be carried on board for the calculation of the stairway widths only.

5.4 Additional notations

5.4.1 The aggregate width of stairway exit doors to the muster station should not be less than the aggregate width of stairways serving this deck.

5.4.2 The area of landings at each deck level required by item (e) of 5.4.3 below shall be based on the total number of persons Z expected to be evacuated and shall be considered prior to the calculation of the stairway width W .

5.4.3

- a) Stairways shall not be less than 900 mm in clear width. Stairways shall be fitted with handrails on each side. The minimum clear width of stairways shall be increased by 10 mm for every one person provided for in excess of 90 persons. The maximum clear width between handrails where stairways are wider than 900 mm shall be 1800 mm.
The total number of persons to be evacuated by such stairways shall be assumed to be two thirds of the crew and the total number of passengers in the areas served by such stairways.
- b) All stairways sized for more than 90 persons shall be aligned fore and aft.
- c) Doorways and corridors and intermediate landings included in means of escape shall be sized in the same manner as stairways.
- d) Stairways shall not exceed 3,5 m in vertical rise without the provision of a landing and shall not have an angle of inclination greater than 45° .
- e) Landings at each deck level shall be not less than 2 m^2 in area and shall increase by 1 m^2 for every 10 persons provided for in excess of 20 persons but need not exceed 16 m^2 , except for those landings servicing public spaces having direct access onto the stairway enclosure.

5.4.4 Means of escape plans shall be provided indicating the following:

- a) the number of crew and passengers in all normally occupied spaces;
- b) the number of crew and passengers expected to escape by the stairways and through doorways, corridors and landings;
- c) muster stations and survival craft embarkation positions;
- d) primary and secondary means of escape;
- e) widths of stairways, doors, corridors and landing areas.

5.4.5 Means of escape plans shall be accompanied by detailed calculations for determining the width of escape stairways, doors, corridors and landing areas.

5.5 Protection of stairways and lifts in accommodation and service spaces

5.5.1 All stairways shall be of steel frame construction except where ^{Tasneef} sanctions the use of other equivalent material, and shall be within enclosures in accordance with the applicable Table 1 or 2 of Section 2, with positive means of closure at all openings, except that:

- a) a stairway connecting only two decks need not be enclosed, provided that the integrity of the deck is maintained by proper bulkheads or doors in one 'tweendeck space. When a stairway is closed in one 'tweendeck space, the stairway enclosure shall be protected in accordance with the applicable Table 1 or Table 2 of Section 2;
- b) stairways may be fitted in the open in a public space, provided they lie wholly within such public space.

5.5.2 Stairway enclosures shall have direct access with the corridors and be of a sufficient area to prevent congestion, having in view the number of persons likely to use them in an emergency. Within the perimeter of such stairway enclosures, only public toilets, lockers of non-combustible material providing storage for safety equipment and open information counters are permitted. Only public spaces, corridors, public toilets, special category spaces, other escape stairways required by item (e) of [1.1.1] and external areas are permitted to have direct access to these stairway enclosures.

5.5.3 Lift trunks shall be so fitted as to prevent the passage of smoke and flame from one 'tweendeck to another and shall be provided with means of closing so as to permit the control of draught and smoke.

6 Openings in class divisions

6.1

6.1.1 Except for hatches between cargo, special category, store and baggage spaces, and between such spaces and weather decks, all openings shall be provided with permanently attached means of closing which shall be at least as

effective for resisting fires as the divisions in which they are fitted.

6.1.2 The construction of all doors and door frames in "A" class divisions, with the means of securing them when closed, shall provide resistance to fire as well as to the passage of smoke and flame, as far as practicable, equivalent to that of the bulkheads in which the doors are situated. Such doors and door frames shall be constructed of steel or other equivalent material. Watertight doors need not be insulated.

Ventilation louvres and other openings are not permitted on doors of "A" class divisions, except when such openings are fitted with efficient closing means, to the satisfaction of ^{Tasneef}. A sight glass may be fitted, provided the glass is of the type reinforced by steel net, having a surface not less than 100 cm² and held in place by a steel frame.

6.1.3 It shall be possible for each door to be opened and closed from each side of the bulkhead by one person only.

6.1.4 Fire doors in main vertical zone bulkheads, galley boundaries and stairway enclosures other than power-operated watertight doors and those which are normally locked, shall satisfy the following requirements:

- a) the doors shall be self-closing and be capable of closing against an angle of inclination of up to 3,5° opposing closure;
- b) the approximate time of closure for hinged fire doors shall be no more than 40 s and no less than 10 s from the beginning of their movement with the ship in upright position. The approximate uniform rate of closure for sliding fire doors shall be no more than 0,2 m/s and no less than 0,1 m/s with the ship in the upright position;
- c) the doors shall be capable of remote release from the continuously manned central control station, either simultaneously or in groups, and shall be capable of release also individually from a position at both sides of the door. Release switches shall have an on-off function to prevent automatic resetting of the system. This requirement is not applicable for fire doors in main vertical zone bulkheads and stairway enclosures;
- d) hold-back hooks not subject to central control station release are prohibited;
- e) a door closed remotely from the central control station shall be capable of being re-opened at both sides of the door by local control. After such local opening, the door shall automatically close again;
- f) indication shall be provided at the fire door indicator panel in the continuously manned central control station whether each of the remote-released doors is closed;
- g) the release mechanism shall also be so designed that the door will automatically close in the event of disruption of the control system or main source of electrical power;
- h) local power accumulators for power-operated doors shall be provided in the immediate vicinity of the doors to enable the doors to be operated after disruption of the control system or main source of electrical power at

least ten times (fully opened and closed) using the local controls;

- i) disruption of the control system or main source of electrical power at one door shall not impair the safe functioning of the other doors;
- j) remote-released sliding or power-operated doors shall be equipped with an alarm that sounds for at least 5 s but no more than 10 s after the door is released from the central control station and before the door begins to move and continues sounding until the door is completely closed;
- k) a door designed to re-open upon contacting an object in its path shall re-open not more than 1 m from the point of contact;
- l) double-leaf doors equipped with a latch necessary for their fire integrity shall have a latch that is automatically activated by the operation of the doors when released by the control system;
- m) doors giving direct access to special category spaces which are power operated and automatically closed need not be equipped with the alarms and remote-release mechanisms required in items (c) and (j);
- n) the components of the local control system shall be accessible for maintenance and adjusting; and
- o) power-operated doors shall be provided with a control system of an approved type which shall be able to operate in the event of fire, this being determined in accordance with IMO Resolution MSC.61(67)

"Fire Test Procedure Code". This system shall satisfy the following requirements:

- 1) the control system shall be able to operate the door at a temperature of at least 200°C for at least 60 min, served by the power supply;
- 2) the power supply for all other doors not subject to fire shall not be impaired; and
- 3) at temperatures exceeding 200°C, the control system shall be automatically isolated from the power supply and shall be capable of keeping the door closed up to at least 945°C.

6.1.5 Where a space is protected by an automatic sprinkler system complying with the provisions of Pt C, Ch3, Sec 1 or fitted with a continuous "B" class ceiling, openings in decks not forming steps in main vertical zones nor bounding horizontal zones shall be closed reasonably tight and such decks shall meet the "A" class integrity requirements in so far as is reasonable and practicable in the opinion of ^{Tasneef}

6.1.6 The requirements for "A" class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles provided that there is no requirement

for such boundaries to have "A" class integrity in Sec 4, [2.3]. The requirements for "A" class integrity of the outer boundaries of the ship shall not apply to exterior doors, except for those in superstructures and deckhouses facing life-saving appliances, embarkation and external muster station areas, external stairs and open decks used for escape routes. Stairway enclosure doors need not meet this requirement.

6.1.7 All "A" class doors located in stairways, public spaces and main vertical zone bulkheads in escape routes shall be equipped with a self-closing hose port of material, construction and fire resistance which is equivalent to the door into which it is fitted, and shall have a 150 mm square clear opening with the door closed and shall be inset into the lower edge of the door, opposite the door hinges or, in the case of sliding doors, nearest the opening.

7 Openings in "B" class divisions

7.1

7.1.1 Doors and door frames in "B" class divisions and means of securing them shall provide a method of closure which shall have resistance to fire equivalent to that of the divisions except that ventilation openings may be permitted in the lower portion of such doors. Where such opening is in or under a door, the total net area of any such opening or openings shall not exceed 0,05 m². When such opening is cut in a door, it shall be fitted with a grill made of non-combustible material. Doors shall be non-combustible.

7.1.2 The requirements for "B" class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles. Similarly, the requirements for "B" class integrity shall not apply to exterior doors in superstructures and deckhouses. ^{Tasneef} may permit the use of combustible materials in doors separating cabins from the individual interior sanitary spaces such as showers.

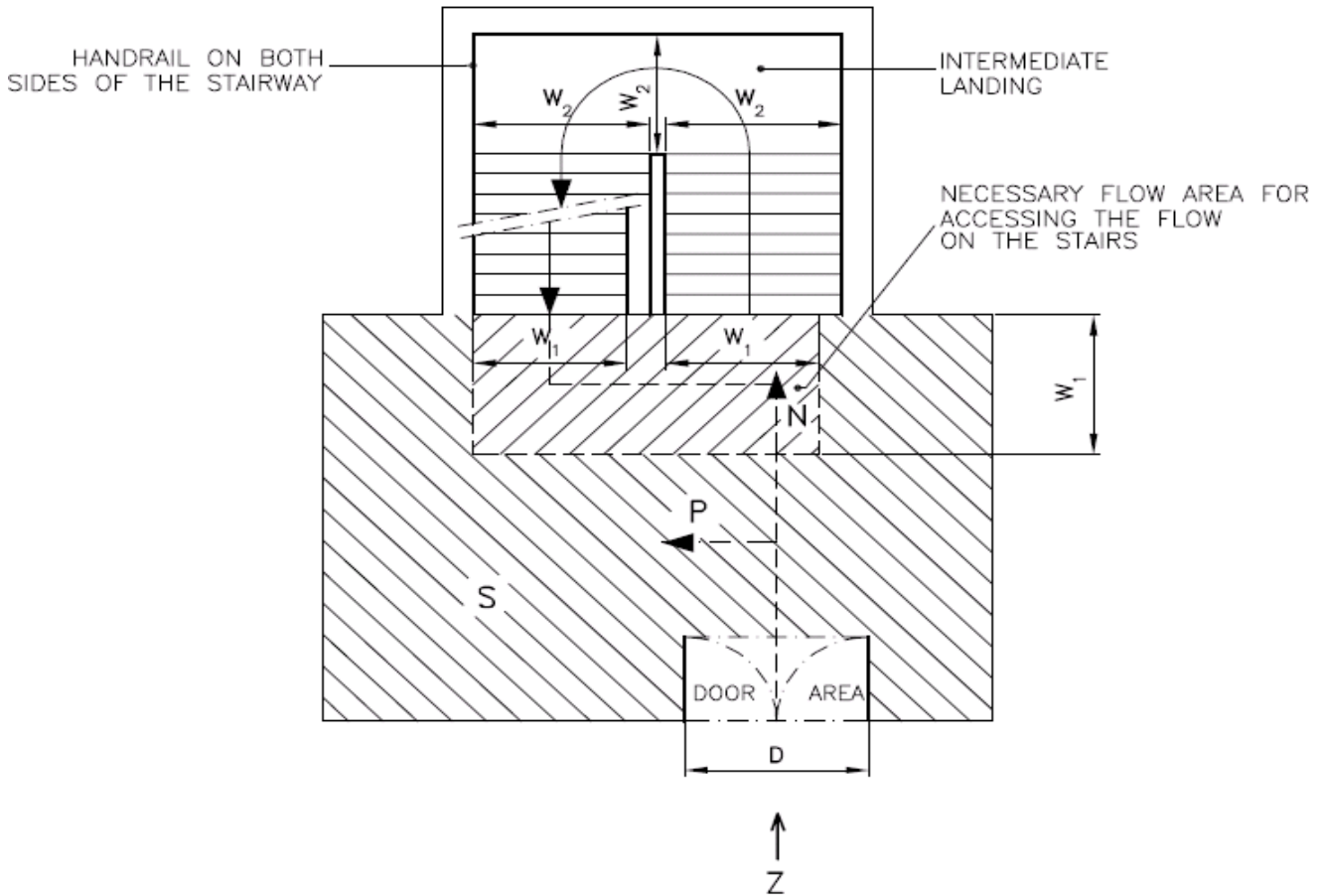
7.1.3 Cabin doors in "B" class divisions shall be of a self-closing type.

Hold-backs are not permitted.

7.1.4 Where an automatic sprinkler system complying with the provisions of Pt C, Ch3, Sec 1 is fitted:

(a) openings in decks not forming steps in main vertical zones nor bounding horizontal zones shall be closed reasonably tight and such decks shall meet the "B" class integrity requirements in so far as is reasonable and practicable in the opinion of ^{Tasneef} and (b) openings in corridor bulkheads of "B" class materials shall be protected in accordance with the provisions of Sec 1, [3.1].

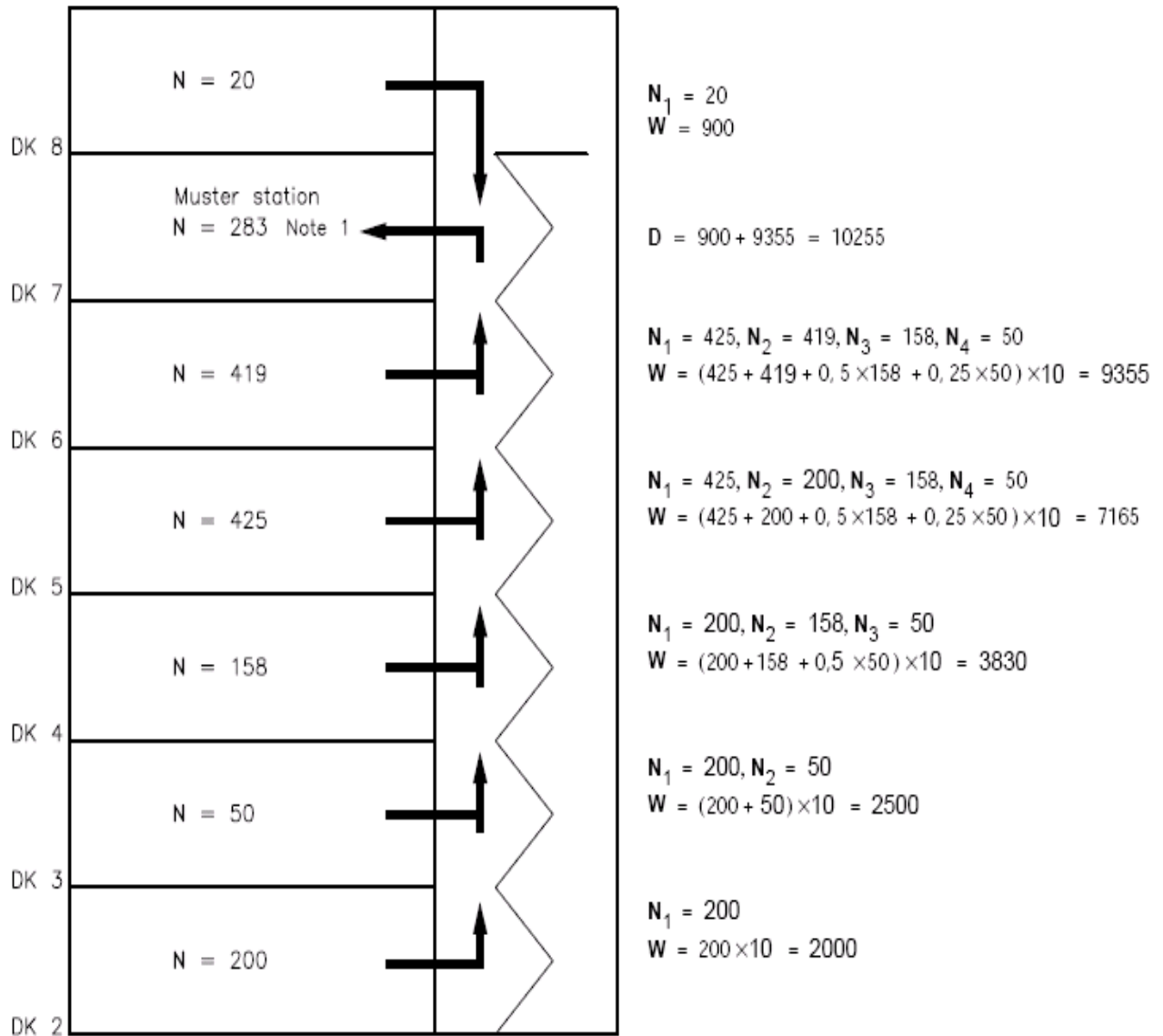
Figure 1 : Landing calculation for stairway width reduction



- p : $S \times 3$ persons/m² = the number of persons taking refuge on the landing to a maximum of $P = 0,25 Z$
- N : $Z - P =$ the number of persons directly entering the stairway flow from a given deck
- Z : number of persons to be evacuated from the deck considered

- S : available landing area (m²) after subtracting the surface area necessary for movement and subtracting the space taken by the door swing area. Landing area is a sum of flow area, credit area and door area.
- D : width of exit doors to the stairway landing area (mm).

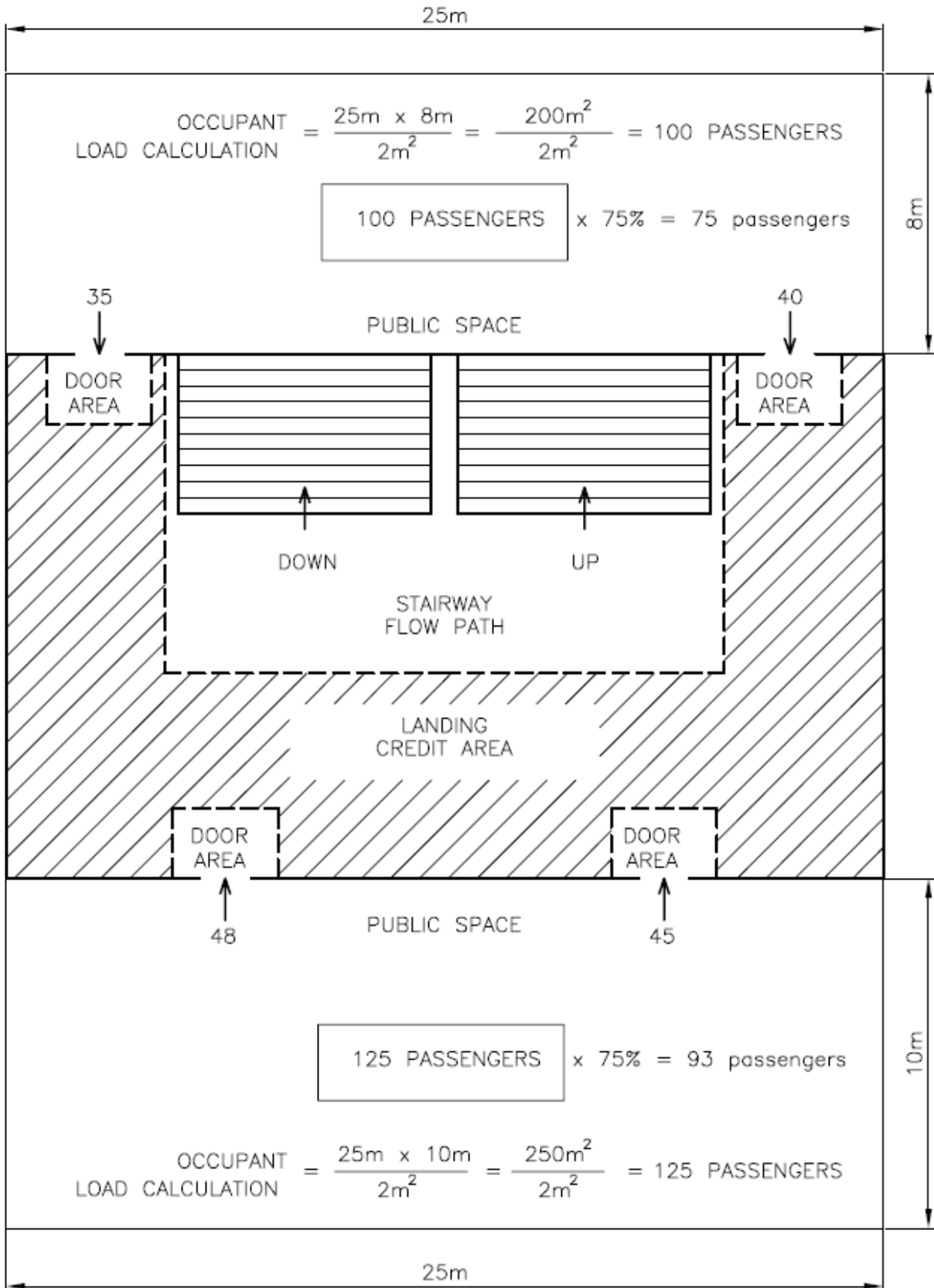
Figure 2 : Landing calculation for stairway width reduction



- Z (pers) : number of persons expected to evacuate through the stairway
- N (pers) : number of persons directly entering the stairway flow from a given deck
- W (mm) : $(N_1 + N_2 + 0,5 \times N_3 + N_4) \times 10$ = calculated width of the stairway
- D (mm) : width of exit doors

- $N_1 > N_2 > N_3 > N_4$ where:
- N_1 (pers) : the deck with the largest number of persons N directly entering the stairway, etc.
- N_2 (pers) : the deck with the next largest number of persons N directly entering the stairway, etc.
- Note: The doors to the muster station should have aggregate width of 10225 mm.

Figure 3 : Occupant landing calculation example



SECTION 4

VENTILATION SYSTEMS

1 Penetrations of class “A” bulkheads or decks

1.1

1.1.1 Where ventilation ducts with a free-sectional area exceeding 0,02 m² pass through class “A” bulkheads or decks, the opening shall be lined with a steel sheet sleeve unless the ducts passing through the bulkheads or decks are of steel in the vicinity of passage through the deck or bulkhead, and the ducts and sleeves in this part shall comply with the following:

- a) The sleeves shall have a thickness of at least 3 mm and a length of at least 900 mm. When passing through bulkheads, this length shall be divided preferably into 450 mm on each side of the bulkhead. These ducts, or sleeves lining such ducts, shall be provided with fire insulation.

The insulation shall have at least the same fire integrity as the bulkhead or deck through which the duct passes. Equivalent penetration protection may be provided.

- b) Ducts with a free cross-sectional area exceeding 0,075 m² shall be fitted with fire dampers in addition to the requirements of the preceding item (a). The fire damper shall operate automatically but shall also be capable of being closed manually from both sides of the bulkhead or deck. The damper shall be provided with an indicator which shows whether it is open or closed. Fire dampers are not required, however, where ducts pass through spaces surrounded by “A” class divisions, without serving those spaces, provided such ducts have the same fire integrity as the divisions which they pierce.

2 Ducts provided for the ventilation of machinery spaces of category A, galleys, car deck spaces, ro-ro cargo spaces or special category spaces

2.1

2.1.1 Ducts provided for the ventilation of machinery spaces of category A, galleys, car deck spaces, ro-ro cargo spaces or special category spaces shall not pass through accommodation spaces, service spaces or control stations unless the ducts are either:

- a) constructed of steel having a thickness of at least 3 mm and 5 mm for ducts the widths or diameters of which are up to and including 300 mm and 760 mm and over, respectively and, in the case of such ducts, the widths or

diameters of which are between 300 mm and 760 mm, having a thickness to be obtained by interpolation;

- b) suitably supported and stiffened;
- c) fitted with automatic fire dampers close to the boundaries penetrated;
- and
- d) insulated to A-60 standard from the machinery spaces, galleys, car deck spaces, ro-ro cargo spaces or special category spaces to a point at least 5 m beyond each fire damper; or
- e) constructed of steel in accordance with the preceding items (a) and (b); and
- f) insulated to A-60 standard throughout the accommodation spaces, service spaces or control stations; except that penetrations of main zone divisions shall also comply with the requirements of [7.1.1].

3 Ducts provided for ventilation to accommodation spaces, service spaces or control stations

3.1

3.1.1 Ducts provided for ventilation to accommodation spaces, service spaces or control stations shall not pass through machinery spaces of category A, galleys, car deck spaces, ro-ro cargo spaces or special category spaces unless either:

- a) where they pass through a machinery space of category A, galley, car deck space, ro-ro cargo space or special category space, the ducts are constructed of steel in accordance with items (a) and (b) of [2];
- b) automatic fire dampers are fitted close to the boundaries penetrated;
- and
- c) fitted with automatic fire dampers close to the boundaries penetrated;
- and
- d) the integrity of the machinery space, galley, car deck space, ro-ro cargo space or special category space boundaries is maintained at the penetrations; or
- e) where they pass through a machinery space of category A, galley, car deck space, ro-ro cargo space or special category space, the ducts are constructed of steel in accordance with items (a) and (b) of [2]; and
- f) are insulated to A-60 standard within the machinery space, galley, car deck space, ro-ro cargo space or special category space; except that penetrations of main zone divisions shall also comply with the requirements of [7.1.1].

4 Penetrations of “B” class divisions

4.1

4.1.1 Ventilation ducts with a free cross-sectional area exceeding 0,02 m² passing through “B” class bulkheads shall be lined with steel sheet sleeves of 900 mm in length divided preferably into 450 mm on each side of the bulkheads unless the duct is of steel for this length.

5 Control stations outside machinery spaces

5.1

5.1.1 Such measures as are practicable shall be taken in respect of control stations outside machinery spaces in order to ensure that ventilation, visibility and freedom from smoke are maintained, so that in the event of fire the machinery and equipment contained therein may be supervised and continue to function effectively. Alternative and separate means of air supply shall be provided; air inlets of the two sources of supply shall be so disposed that the risk of both inlets drawing in smoke simultaneously is minimised. Such requirements need not apply to control stations situated on, and opening on to, an open deck, or where local closing arrangements would be equally effective.

6 Galleys

6.1

6.1.1 Where they pass through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be constructed of “A” class divisions. Each exhaust duct shall be fitted with:

- a) a grease trap readily removable for cleaning;
- b) a fire damper located in the lower end of the duct;
- c) arrangements, operable from within the galley, for shutting off the exhaust fans; and
- d) fixed means for extinguishing a fire within the duct.

7 Penetrations of main vertical zones

7.1

7.1.1 Where in a passenger ship it is necessary that a ventilation duct passes through a main vertical zone division, a

fail-safe automatic closing fire damper shall be fitted adjacent to the division. The damper shall also be capable of being manually closed from each side of the division.

The operating position shall be readily accessible and be marked in red light-reflecting colour. The duct between the division and the damper shall be of steel or other equivalent material and, if necessary, insulated to ensure that the fire resistance is not impaired. The damper shall be fitted on at least one side of the division with a visible indicator showing whether it is in the open position.

8 Closing from outside

8.1

8.1.1 The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated.

9 Stopping of systems from outside

9.1

9.1.1 Power ventilation of accommodation spaces, service spaces, cargo spaces, control stations and machinery spaces shall be capable of being stopped from an easily accessible position outside the space being served.

This position should not be readily cut off in the event of a fire in the spaces served. The means provided for stopping the power ventilation of machinery spaces shall be entirely separate from the means provided for stopping ventilation of other spaces.

10 Fire test of arrangements

10.1

10.1.1 The following arrangements shall be tested in accordance with IMO Resolution MSC.61(67) "Fire Test Procedures Code":

- a) fire dampers, including relevant means of operation; and
- b) duct penetrations through "A" class divisions. Where steel sleeves are directly joined to ventilation ducts by means of rivetted or screwed flanges or by welding, the test is not required.

SECTION 5

OTHER FIRE SAFETY MEASURES FOR PASSENGER SHIPS

1 Windows and sidescuttles

1.1

1.1.1 All windows and sidescuttles in bulkheads within accommodation and service spaces and control stations other than those to which the provisions of [6.1.6] and [7.1.2] of Section 2 apply, shall be so constructed as to preserve the integrity requirements of the type of bulkheads in which they are fitted.

1.1.2 Notwithstanding the requirements of Tables 1 and 2 of Section 1, all windows and sidescuttles in bulkheads separating accommodation and service spaces and control stations from weather shall be constructed with frames of steel or other suitable material. The glass shall be retained by a metal glazing bead or angle.

1.1.3 Windows facing life-saving appliances, embarkation and muster areas, external stairs and open decks used for escape routes, and windows situated below liferaft and escape slide embarkation areas shall have fire integrity as required in Tables 1 and 2 of Section 1.

Where automatic dedicated sprinkler heads are provided for windows, A-0 windows may be accepted as equivalent. Windows located in the ship side below the lifeboat embar-

kation areas shall have fire integrity at least equal to "A-0" class.

2 Restricted use of combustible materials

2.1

2.1.1 In accommodation and machinery spaces, paints, varnishes and similar preparations having a nitro-cellulose or other highly flammable base shall not be used.

2.1.2 "B" class shall in any case be constructed of non-combustible materials, as stated in the relevant definitions in Section 1.

2.1.3 Paints, varnishes and other finishes used on exposed interior surfaces shall not be capable of producing excessive quantities of smoke and toxic products, this being determined in accordance with IMO Resolution MSC.61 (67) "Fire Test Procedures Code".

2.1.4 Primary deck coverings, if applied within accommodation and service spaces and control stations, shall be of approved material which will not readily ignite or give rise to toxic or explosive hazards at elevated temperatures, this being determined in accordance with IMO Resolution MSC.61 (67) "Fire Test Procedures Code".

SECTION 6

ARRANGEMENTS AND MEANS FOR THE FIRE PROTECTION OF THE VARIOUS SHIP SPACES

1 Water fire-fighting system

1.1

1.1.1 A water fire-extinguishing system is to be provided consisting of:

- a) two motor-driven fire-extinguishing pumps of sufficient capacity, at least one of which is permanently installed;
- b) one fire extinguisher line with a sufficient number of hydrants with permanently connected fire hoses at least 20 m in length and fitted with a nozzle capable of producing both a mist and a jet of water and incorporating a shut-off facility.

Hydrant systems are to be designed and dimensioned in such a way that:

- a) any point of the vessel can be reached from at least two hydrants in different places, each with a single hose length of not more than 20 m;
- b) the pressure at the hydrants is at least 300 kPa; and
- c) on all decks a water jet length of at least 6 m can be attained.

If a hydrant chest is provided, an 'extinguisher hose' suitability symbol, of at least 10 cm side length, is to be affixed to the outside of the chest.

- d) Hydrant valves with screw threads or cocks are to be such that they can be set so that each of the fire hoses can be separated and removed during operation of the fire-extinguishing pumps.
- e) Fire extinguisher hoses in the internal area are to be rolled up on an axially connected reel.
- f) Materials for fire-fighting equipment are either to be heat-resistant or to be suitably protected against failure to work when subjected to high temperatures.
- g) Pipes and hydrants are to be arranged in such a way that the possibility of freezing is avoided.

1.1.2 The fire-extinguishing pumps are to:

- a) be installed or housed in separate rooms;
- b) be such that they can be operated independently of each other;
- c) each be capable, on all decks, of maintaining the necessary pressure at the hydrants and achieving the requisite length of water jet;
- d) be installed forward of the aft bulkhead.

Fire-extinguishing pumps may also be used for general purposes.

2 Portable fire extinguishers

2.1

2.1.1 There is to be at least one portable fire extinguisher in accordance with European Standard EN 3:1996 or equivalent standard at each of the following places:

- a) in the wheelhouse;
- b) close to each entrance from the deck to accommodation spaces;
- c) close to each entrance to service spaces which are not accessible from the accommodation spaces and which contain heating, cooking or refrigeration equipment using solid or liquid fuels or liquefied gas;
- d) at each entrance to engine rooms and boiler rooms;
- e) at suitable points below deck in engine rooms and boiler rooms such that no position in the space is more than 10 metres walking distance from an extinguisher.

2.1.2 For the portable fire extinguishers required by [2.1.1], only powder type extinguishers with a content of at least 6 kg or other portable fire extinguishers with the same extinguishing capacity may be used. They are to be suitable for class A, B and C fires and for fires in electrical systems of up to 1000 V.

2.1.3 In addition, powder, water or foam fire extinguishers may be used which are suitable at least for the class of fire most likely to occur in the room for which they are intended.

2.1.4 Portable fire extinguishers with CO₂ as the extinguishing agent may be used only for extinguishing fires in galleys and electrical installations. The content of these fire extinguishers is to be no more than 1 kg per 15 m³ of the room in which they are made available for use.

2.1.5 Portable fire extinguishers are to be checked at least every two years.

2.1.6 In addition to the above portable extinguishers, at least the following are to be available on board:

- a) one portable extinguisher for every 120 m² of gross floor area in passenger areas;
- b) one portable extinguisher per group of 10 cabins, rounded upwards;
- c) one portable extinguisher in each galley and in the vicinity of any room in which flammable liquids are stored or used. In galleys, the extinguishing agent is also to be suitable for fighting fat fires.

These additional fire extinguishers are to meet the requirements laid down in [2.1.2] above, and be installed and dis-

tributed on the vessel so that, in the event of a fire starting at any point and at any time, a fire extinguisher can be reached immediately. In every galley and also in hairdressing salons and perfumeries, there is to be a fire blanket to hand.

3 Fixed fire-extinguishing systems

3.1

3.1.1 A fixed fire-extinguishing system is to be provided for machinery spaces containing internal combustion engines used for propulsion and oil fired boilers. Such systems are to be in conformity with the requirements stated in IMO Fire Safety Systems Code, Chapter 5 and with the requirements given in Sec 3, [1.7] of the Rules for fire protection, detection and extinction for the issue of statutory certificates other than SOLAS Certificates.

3.1.2 Where installed, automatic pressure water-spraying systems for the passenger area are to be ready for operation at all times when passengers are on board. No additional measures on the part of crew must be needed to actuate the system.

4 Fire patrols, detection, alarms and public address systems

4.1

4.1.1 Manually operated call points shall be fitted throughout accommodation and service spaces to transmit an alarm immediately to the navigating bridge or main fire control station.

The number and position of such call points shall be to the satisfaction of ^{Tasneef} but, in any case, there shall be at least one call point near each escape from the group of spaces concerned.

4.1.2 A fixed fire detection and fire alarm system complying with the requirements of IMO Fire Safety Systems Code, Chapter 9 or a sample extraction smoke detection system complying with the requirements of IMO Fire Safety Systems Code, Chapter 10 shall be provided in any cargo space which, in the opinion of ^{Tasneef} is not accessible, except where it is shown to the satisfaction of ^{Tasneef} that the ship is engaged on voyages of such short duration that it would be unreasonable to apply this requirement.

4.1.3 (1/1/2022)

All ships shall at all times during navigation, or in port (except when out of service), be so manned or equipped as to ensure that any initial fire alarm is immediately received by a responsible member of the crew.

4.1.4 A special alarm, operated from the navigating bridge or fire control station, shall be fitted to summon the crew. This alarm may be part of the ship's general alarm system but it shall be capable of being sounded independently of the alarm to the passenger spaces.

4.1.5 A public address system or other effective means of communication shall be available throughout accommodation and service spaces and control stations and open decks. Each member of the fire patrol shall be provided with a two-way portable radiotelephone apparatus.

4.1.6 Where public spaces span three or more open decks and contain combustibles such as furniture and enclosed spaces such as shops, offices and restaurants, the entire main vertical zone containing the space shall be protected throughout with a smoke detection system complying IMO Fire Safety Systems Code, Chapter 9.

5 Firemen's outfits

5.1

5.1.1 In general, ships shall carry at least one fireman's outfit.

The fireman's outfit may be omitted in the case of ships having small size enclosed spaces, in which persons are normally present or the crew is normally employed.

In any case, passenger ships carrying motor vehicles in special category spaces shall carry at least one fireman's outfit, when of less than 500 gross tonnage, and upwards.

5.1.2 The above fireman's outfit shall include:

- a) personal equipment comprising:
 - 1) protective clothing of material to protect the skin from the heat radiating from the fire and from burns and scalding by steam.
The outer surface shall be water-resistant.
 - 2) boots and gloves of rubber or other electrically non-conducting material.
 - 3) a rigid helmet providing effective protection against impact.
 - 4) an electric safety lamp (hand lantern) of an approved type with a minimum burning period of three hours.
 - 5) a suitable axe.
- b) a breathing apparatus of an approved type which may be either:
 - 1) a smoke helmet or smoke mask which shall be provided with a suitable air pump and a length of air hose sufficient to reach from the open deck, well clear of hatch or doorway, to any part of the holds or machinery spaces. If, in order to comply with this item (b)(1), an air hose exceeding 36 m in length would be necessary, a self-contained breathing apparatus shall be substituted or provided in addition; or
 - 2) a self-contained compressed air-operated breathing apparatus, the volume of air contained in the cylinders of which shall be at least 1200 l, or other self-contained breathing apparatus which shall be capable of functioning for at least 30 minutes. A number of spare charges, suitable for use with the apparatus provided, shall be available on board.

The spare charges for each air-operated breathing apparatus belonging to the required fireman's outfit shall, in general, consist of:

- two bottles for each required self-contained breathing apparatus fitted with one bottle and four bottles for each required self-contained breathing apparatus fitted with two bottles, or
- one bottle for each required self-contained breathing apparatus fitted with one bottle and two bottles for each required self-contained breathing apparatus fitted with two bottles and, in addition, one air compressor and associated fittings deemed suitable by ^{Tasneef} and capable of supplying clean air, at the required pressure, for the recharge of the bottles.

5.1.3 For each breathing apparatus, a fireproof lifeline of sufficient length and strength shall be provided capable of being attached by means of a snaphook to the harness of the apparatus or to a separate belt in order to prevent the breathing apparatus becoming detached when the lifeline is operated.

The above lifeline, which may be for example a steel rope covered by vegetable fibre, shall have a breaking strength not less than 10 kN and a length greater than the maximum distance between the weather deck and each hold, machinery space and accommodation space.

5.1.4 The firemen's outfits or sets of personal equipment shall be so stored as to be easily accessible and ready for use and, where more than one fireman's outfit or more than one set of personal equipment is carried, they shall be stored in widely separated positions.

6 Protection of special category spaces (and of similar partially open spaces)

6.1 Provisions applicable to special category spaces whether above or below the bulkhead deck

6.1.1 General

- The basic principle underlying this paragraph is that as normal main vertical zoning may not be practicable in special category spaces, equivalent protection must be obtained in such spaces on the basis of a horizontal zone concept and by the provision of an efficient fixed fire-extinguishing system. According to this concept for the purpose of this paragraph a horizontal zone may include special category spaces on more than one deck provided that the total overall clear height for vehicles does not exceed 10 m.
- The requirements in Section 3 [6] and Section 4 for maintaining the integrity of vertical zones shall be applied equally to decks and bulkheads forming the boundaries separating horizontal zones from each other and from the remainder of the ship.
- In the case of ships engaged on voyages not exceeding two hours, ^{Tasneef} may grant exemptions from the

requirements concerning the insulation standards of bulkheads and decks and the ventilation system.

6.1.2 Structural protection

Boundary bulkheads of special category spaces shall be insulated as required for category (11) spaces in Table 1 of Section 1 and the horizontal boundaries as required for category (11) spaces in Table 2 of Section 1.

Indicators shall be provided on the navigating bridge showing when any fire door leading to or from special category spaces is closed.

6.1.3 Fixed fire-extinguishing systems

Each special category space shall be fitted with an approved fixed pressure water-spraying system for manual operation, which shall protect all parts of any deck and vehicle platform in such space. The use of any other fixed fire-extinguishing system that has been shown by full-scale test in conditions simulating a flowing petrol fire in a special category space to be not less effective in controlling fires likely to occur in such a space may be permitted. For the above purposes, the following two systems shall be considered adequate:

- A fixed pressure water-spraying system complying with the following:

The system shall have a capacity such as to be able to deliver at least:

- 3,5 litres per square metre per minute for spaces having a height not exceeding 2,5 metres;
- 5 litres per square metre per minute for spaces having a height more than 2,5 metres.

The system shall protect the whole space but may be subdivided into sections. Each section shall be not less than 20 metres long. These sections shall, as a rule, have the same width as the space width except for those ships where the space is subdivided by "A" class longitudinal fire divisions forming the boundaries of stairways or other spaces, for which the section width may be reduced in proportion. An even water distribution to the whole space to be protected shall be ensured.

The distribution valves for the system should be located in an easily accessible position, adjacent to but outside the space to be protected, which will not readily be cut off by a fire within the space.

Direct access to the distribution valves should be provided from inside and outside the space. Adequate ventilation means shall be fitted in the space containing the distribution valves.

The spraying nozzles, which shall be type approved, are to be deemed suitable by ^{Tasneef} for the system for which they are intended and are to be arranged in such a way as to ensure an even water distribution in the spaces to be protected. The water supply to the system shall be provided by one or more independent pumps which are not the required ship's fire pumps or other pumps intended for services essential for safety and navigation. In any case, the required ship's fire pumps shall be connected to the fire-extinguishing system of the space to be protected by manually lockable non-return valves which will prevent a back-flow from the pressure water-spraying system to the fire main. The pump or pumps

shall be capable at all times of simultaneously providing a sufficient supply of water at the required pressure to all nozzles of the system or at least to those of two sections thereof. The pump or pumps shall be capable of being brought into operation by remote control from the same position at which the distribution valves are located.

- b) A fixed high expansion foam system of approved type capable of protecting all the deck parts of the space and also any platforms. The system shall be capable of discharging a quantity of foam sufficient to:
- fill the greatest space to be protected at a rate of 1 metre in depth per minute, referring to the maximum horizontal area of the space itself;
 - fill the whole space to be protected within 5 minutes.

A quantity of foam forming liquid sufficient to produce a volume of foam not less than 5 times the volume of the largest space to be protected shall be available on board.

6.1.4 Patrols and fire detection and fire alarm system

- a) An efficient patrol system shall be maintained in special category spaces. In any such space in which the patrol is not maintained by a continuous fire watch at all times during the voyage there shall be provided a fixed fire detection and fire alarm system of an approved type complying with the requirements of IMO Fire Safety Systems Code, Chapter 9. The fixed fire detection system shall be capable of rapidly detecting the onset of fire. The spacing and location of detectors shall be tested to the satisfaction of ^{Tasneef} taking into account the effects of ventilation and other relevant factors.
- b) Manually operated call points shall be provided as necessary throughout special category spaces and one shall be placed close to each exit from such spaces.

6.1.5 Fire-extinguishing equipment

There shall be provided in each special category space:

- a) at least three water fog applicators;
- b) one portable foam applicator unit complying with the provisions of the following point (e), provided that at least two such units are available in the ship for use in such spaces;
- c) an adequate number of portable fire extinguishers as ^{Tasneef} may deem sufficient, provided that at least one portable extinguisher is located at each access to such spaces;
- d) in general, portable extinguishers of type suitable for extinguishing oil fires at each deck level and at each ship side so located that the distance between two extinguishers does not exceed 20 m, with a minimum of two extinguishers located at each end.
- e) A portable foam applicator unit shall consist of an air-foam nozzle of an inductor type capable of being connected to the fire main by a fire hose, together with a portable tank containing at least 20 l of foam-making liquid and one spare tank. The nozzle shall be capable

of producing effective foam suitable for extinguishing an oil fire, at the rate of at least 1,5 m³/minute.

6.1.6 Ventilation system (1/1/2022)

- a) There shall be provided an effective power ventilation system for special category spaces sufficient to give at least 10 air changes per hour. The system for such spaces shall be entirely separated from other ventilation systems and shall be operating at all times when vehicles are in such spaces. ^{Tasneef} may require an increased number of air changes when vehicles are being loaded and unloaded. Ventilation ducts serving special category spaces capable of being effectively sealed shall be separated for each such space. The system shall be capable of being controlled from a position outside such spaces.
- b) The ventilation shall be such as to prevent air stratification and the formation of air pockets.
- c) Means shall be provided to indicate on the navigating bridge any loss or reduction of the required ventilating capacity.
- d) Arrangements shall be provided to permit a rapid shutdown and effective closure of the ventilation system in case of fire, taking into account the weather and water conditions.
- e) Ventilation ducts, including dampers, shall be made of steel and their arrangement shall be to the satisfaction of ^{Tasneef}
- f) Impeller materials of exhaust fans shall have anti-static properties to the satisfaction of ^{Tasneef} and be spark-proof in respect of the material of impeller housings; reference is to be made to Part C for such requirements.

6.2 Additional provisions applicable only to special category spaces above the bulkhead deck

6.2.1 Scuppers

In view of the serious loss of stability which could arise due to large quantities of water accumulating on deck or decks consequent to the operation of the fixed pressure water-spraying system, scuppers shall be fitted so as to ensure that such water is rapidly discharged directly overboard.

In any case the drainage facilities shall be such as to prevent the formation of free surfaces of liquids. When such prevention is not practicable, the adverse effect on stability of the water weight and of free surfaces of liquids shall be taken into account in stability calculations.

6.2.2 Discharge valves for scuppers (1/1/2022)

- a) In all ro-ro passenger ships discharge valves for scuppers, fitted with positive means of closing operable from a position above the bulkhead deck in accordance with the requirements of the International Convention on Load Lines in force, shall be kept open while the ships are in navigation.
- b) Any operation of the valves referred to in item (a) shall be recorded in the log-book.

6.2.3 Precautions against ignition of flammable vapours

- a) On any deck or platform, if fitted, on which vehicles are carried and on which explosive vapours might be expected to accumulate, except platforms with openings of sufficient size permitting penetration of petrol gases downwards, equipment which may constitute a source of ignition of flammable vapours and, in particular, electrical equipment and wiring, shall be installed at least 450 mm above the deck or platform. Electrical equipment installed at more than 450 mm above the deck or platform shall be of a type so enclosed and protected as to prevent the escape of sparks. However, if ^{Tasneef} is satisfied that the installation of electrical equipment and wiring at less than 450 mm above the deck or platform is necessary for the safe operation of the ship, such electrical equipment and wiring may be installed provided that it is of a type approved for use in an explosive petrol and air mixture.
- b) If installed in an exhaust ventilation duct, electrical equipment and wiring shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

6.3 Additional provisions applicable only to special category spaces below the bulkhead deck

6.3.1 Bilge pumping and drainage

In view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or tank top consequent to the operation of the fixed pressure water-spraying system, ^{Tasneef} may require pumping and drainage facilities to be provided additional to those prescribed in Part C of these Rules.

In any case, pumping and drainage facilities shall be such as to prevent the formation of free surfaces of liquids. When such prevention is not practicable, the adverse effect on the stability of the water weight and of free surfaces of liquids shall be taken into account in stability calculations.

6.3.2 Precautions against ignition of flammable vapours

- a) If fitted, electrical equipment and wiring shall be of a type suitable for use in explosive petrol and air mixtures. Other equipment which may constitute a source of ignition of flammable vapours is not permitted.
- b) If installed in an exhaust ventilation duct, electrical equipment and wiring shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

6.4 Provisions applicable to partially open spaces

6.4.1 Partial exemptions from the requirements above concerning ventilation, electrical installations and the insulating value of decks and bulkheads may be granted by ^{Tasneef}

for spaces similar to special category spaces but having openings, in way of longitudinal walls or of their ends, whose area is not less than 60% of the surface of longitudinal walls or of end transverse bulkheads. Such spaces shall be protected by a manually operated pressure water-spraying system complying with the requirements of [6.1.3.1].

6.5 Permanent openings for ventilation

6.5.1 Permanent openings in the side plating, ends or deckhead of special category spaces shall be so situated that a fire in the special category space does not endanger stowage areas and embarkation stations for survival craft and accommodation spaces, service spaces and control stations in superstructures and deckhouses above special category spaces.

7 Protection of cargo spaces, other than special category spaces, intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion

7.1 Premise

7.1.1 In any cargo space (other than special category spaces) containing motor vehicles with fuel in their tanks for their own propulsion, the following provisions shall be complied with.

7.1.2 In the case of ships engaged on voyages not exceeding two hours, ^{Tasneef} may grant exemptions from the requirements concerning the insulation standards of bulkheads and decks and the ventilation system.

7.2 Fire detection and fire alarm

7.2.1 There shall be provided a fixed fire detection and fire alarm system complying with the requirements of IMO Fire Safety Systems Code, Chapter 9 or a sample extraction smoke detection system complying with the requirements of IMO Fire Safety Systems Code, Chapter 10. The design and arrangements of this system shall be considered in conjunction with the ventilation requirements referred to in [7.4].

7.3 Fire-extinguishing arrangements

7.3.1 There shall be fitted a fixed gas fire-extinguishing system which shall comply with the provisions of Pt C, Ch 3, Sec 1, except that, if a carbon dioxide system is fitted, the quantity of gas available shall be at least sufficient to give a minimum volume of free gas equal to 45 per cent of the gross volume of the largest such cargo space which is capable of being sealed, and the arrangements shall be such as to ensure that at least two thirds of the gas required for the relevant space shall be introduced in 10 minutes. Any other fixed gas fire-extinguishing system or fixed high expansion foam fire-extinguishing system may be fitted provided it gives equivalent protection.

7.3.2 As an alternative, a pressure water-spraying system complying with the requirements of [6.1.3.1] may be fitted, provided that the requirements of items [6.2.1.1] or [6.3.1.1], as appropriate, are also complied with.

7.3.3 There shall be provided for use in any such space such number of portable fire extinguishers as ^{Tasneef} may deem sufficient. At least one portable fire extinguisher shall be located at each access to such spaces.

In general, portable extinguishers of type suitable for extinguishing an oil fire are to be fitted at each deck level and at each ship side so located that the distance between two extinguishers does not exceed 20 m, with a minimum of two extinguishers located at each end.

7.4 Ventilation systems

7.4.1 There shall be provided an effective power ventilation system sufficient to give at least 6 air changes per hour. The system for such cargo spaces shall be entirely separate from other ventilation systems and shall be operating at all times when vehicles are in such spaces.

Ventilation ducts serving such cargo spaces capable of being effectively sealed shall be separated for each such space.

The system shall be capable of being controlled from a position outside such spaces.

7.4.2 The ventilation shall be such as to prevent air stratification and the formation of air pockets.

7.4.3 Means shall be provided to indicate on the navigating bridge any loss or reduction of the required ventilating capacity.

7.4.4 (1/1/2022)

Arrangements shall be provided to permit a rapid shutdown and effective closure of the ventilation system in case of fire, taking into account the weather and water conditions.

7.4.5 Ventilation ducts, including dampers, shall be made of steel and their arrangement shall be to the satisfaction of ^{Tasneef}

7.4.6 Impeller materials of exhaust fans shall have anti-static properties to the satisfaction of ^{Tasneef} and be spark-proof in respect of the material of impeller housings. Reference is to be made to Pt C, Ch3, Sec 1.

7.5 Precautions against ignition of flammable vapours

7.5.1 If fitted, electrical equipment and wiring shall be of a type suitable for use in explosive petrol and air mixtures.

Other equipment which may constitute a source of ignition of flammable vapours is not permitted.

7.5.2 If installed in an exhaust ventilation duct, electrical equipment and wiring shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.

7.5.3 Scuppers shall not be led to machinery or other spaces where sources of ignition may be present.

7.6 Protection of open deck spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion

7.6.1 In the case of carriage of motor vehicles with fuel in their tanks on open deck spaces, the deck may be counter-sheathed in wood and, in general, no communication stairways with enclosed spaces below or adjacent to the above zone are allowed.

In the event of fire in motor vehicle spaces, access to the ship manoeuvring spaces, to the places where safety appliances are located, to the lifeboats and liferafts, and to the relevant embarkation areas shall not be precluded.

If main stairways, not for emergency, giving access to accommodation spaces below or adjacent to the open deck space intended for the carriage of motor vehicles lead to such space, sufficient room shall be left available around the door of the escape and, in addition, an escape route connecting the above room with the means of escape leading to lifeboat and liferaft embarkation areas is to be provided.

The above-mentioned room and escape route shall be permanently marked on the deck.

7.7 Permanent openings for ventilation

7.7.1 Permanent openings in the side plating, ends or deckhead of cargo spaces shall be so situated that a fire in the cargo space does not endanger stowage areas and embarkation stations for survival craft and accommodation spaces, service spaces and control stations in superstructures and deckhouses above cargo spaces.

7.8 Structural protection

7.8.1 For ro-ro cargo spaces the requirements in [8.1.1] and [8.1.2] shall be complied with.

8 Protection of closed and open ro-ro cargo spaces, other than special category spaces and ro-ro cargo spaces intended for the carriage of motor vehicles with fuel in their tanks

8.1 General

8.1.1 The basic principles in [6.1.1] also apply to this Article.

8.1.2 Boundary bulkheads and decks of closed and open ro-ro cargo spaces shall have fire integrity as required for category (8) spaces in Table 1 and the horizontal boundaries as required for category (8) spaces in Table 2 of Section 1.

8.1.3 Permanent openings in the side plating, ends or deckhead of open and closed ro-ro cargo spaces shall be so situated that a fire in the cargo spaces does not endanger stowage areas and embarkation stations for survival craft and accommodation spaces, service spaces and control stations in superstructures and deckhouses above the cargo spaces.

8.2 Closed ro-ro cargo spaces

8.2.1 Closed ro-ro cargo spaces shall comply with the requirements of Article 7, except for [7.5].

8.3 Open ro-ro cargo spaces

8.3.1 Open ro-ro cargo spaces shall comply with the requirements in [6.1.3.1], [6.2.1.1], [7.2.1], except that a

sample extraction smoke detection system is not permitted, and [7.3.3].

9 Fixed fire-extinguishing arrangements in cargo spaces

9.1 General

9.1.1 Except as provided for in [9.3], cargo spaces of ships of 1000 gross tonnage and upwards shall be protected by a fixed gas fire-extinguishing system complying with the provisions of IMO Fire Safety Systems Code, Chapter 5, or by a fixed high expansion foam fire-extinguishing system which gives equivalent protection.

9.1.2 Where it is shown to the satisfaction of ^{Tasneef} that a ship is engaged on voyages of such short duration that it would be unreasonable to apply the requirements of [9.1] and also in ships of less than 1000 gross tonnage, the arrangements in cargo spaces shall be to the satisfaction of ^{Tasneef}

9.1.3 Any cargo spaces on ship engaged in the carriage of dangerous goods shall be provided with a fixed gas fire-extinguishing system complying with the provisions of IMO Fire Safety Systems Code, Chapter 5 and with the requirements given in Sec 3, [1.7] of the Rules for fire protection, detection and extinction for the issue of statutory certificates other than SOLAS Certificates, or with a fire-extinguishing system which in the opinion of ^{Tasneef} gives equivalent protection for the cargoes carried.

SECTION 7

ARRANGEMENTS FOR OIL FUEL, LUBRICATING OIL AND OTHER FLAMMABLE OILS

1 General

1.1

1.1.1 The requirements of this Section generally apply, with relaxation as deemed appropriate by ^{Tasneef} in relation to the size and characteristics of the ship concerned.

2 Limitations in the use of oil as fuel

2.1

2.1.1 The following limitations shall apply to the use of oil as fuel:

- a) Except as otherwise permitted by the following requirements, no oil fuel with a flashpoint of less than 60°C shall be used.
- b) In emergency generators, oil fuel with a flashpoint of not less than 43°C may be used.
- c) Subject to such additional precautions as it may consider necessary and on condition that the ambient temperature of the space in which such oil fuel is stored or used shall not be allowed to rise to within 10°C below the flashpoint of the oil fuel, ^{Tasneef} may permit the general use of oil fuel having a flashpoint of less than 60°C but not less than 43°C.
- d) Oil fuel in storage tanks shall not be heated to temperatures within 10°C below the flashpoint of the fuel oil, except for the following.

Oil fuel in service tanks, settling tanks and any other tanks in the supply system may be heated above this limit, provided:

- the length of the vent pipes from such tanks and/or a cooling device is sufficient for cooling the vapours to at least 10°C below the flashpoint of the fuel oil;
- a temperature sensor is fitted in the vent pipe and adjusted to give an alarm if the temperature exceeds a limit set at 10°C below the flashpoint of the fuel;
- the vent pipes are fitted with flame screens meeting the requirements of IMO's "Standards for the design, testing and locating of devices to prevent the passage of flame into cargo tanks in tankers",
- there are no openings from the vapour space of the fuel tanks into machinery spaces (bolted manholes are acceptable);
- enclosed spaces are not located directly over such fuel tanks, except for well-ventilated cofferdams;
- electrical equipment is not fitted in the vapour space of the tanks, unless it is certified as being intrinsically safe.

3 Oil fuel arrangements

3.1

3.1.1 The arrangements for the storage, distribution and utilisation of oil fuel shall be such as to ensure the safety of the ship and persons on board and shall comply with at least the following provisions.

3.1.2 As far as practicable, parts of the oil fuel system containing heated oil under pressure exceeding 0,18 N/mm² shall not be placed in a concealed position such that defects and leakage cannot readily be observed. The machinery spaces in way of such parts of the oil fuel system shall be adequately illuminated.

3.1.3 The ventilation of machinery spaces shall be sufficient under all normal conditions to prevent accumulation of oil vapour.

3.1.4 As far as practicable, oil fuel tanks shall be part of the ship's structure and shall be located outside machinery spaces of category A. Where oil fuel tanks, other than double bottom tanks, are necessarily located adjacent to or within machinery spaces of category A, at least one of their vertical sides shall be contiguous to the machinery space boundaries, shall preferably have a common boundary with the double bottom tanks, and the area of the tank boundary common with the machinery spaces shall be kept to a minimum.

Where such tanks are situated within the boundaries of machinery spaces of category A they shall not contain oil fuel having a flashpoint of less than 60°C.

In general, the use of free-standing oil fuel tanks shall be avoided.

When such tanks are employed, their use shall be prohibited in category A machinery spaces on passenger ships. Where permitted, they shall be placed in an oil-tight spill tray of ample size having a suitable drain pipe leading to a suitable sized spill oil tank.

3.1.5 No oil fuel tank shall be situated where spillage or leakage therefrom can constitute a hazard by falling on heated surfaces, electrical equipment or other sources of ignition. Precautions (e.g. shielding) shall be taken to prevent any oil that may escape under pressure from any pump, filter, heater or piping from coming into contact with heated surfaces, electrical equipment or other sources of ignition. Oil tanks, pipes, filters, heaters etc. shall not be located immediately above or near units of high temperature including boilers, steam pipe lines, exhaust manifolds, silencers or other equipment required to be insulated, or near electrical equipment and, as far as practicable, are to

be arranged well clear of such units and equipments. Oil filters fitted in parallel for the purpose of enabling cleaning without disrupting the oil supply to the engines (e.g. duplex filters) are to be provided with arrangements that will minimise the possibility of a filter under pressure being opened by mistake. Filters/filter chambers shall be provided with suitable means for:

- venting when put into operation
- depressurising before being opened.

Hydraulic units with working pressure above 1,5 N/mm² shall preferably be placed in separate spaces. If it is impracticable to locate such units in a separate space, adequate shielding shall be provided.

3.1.6 Every oil fuel pipe which, if damaged, would allow oil to escape from a storage, settling or daily service tank situated above the double bottom shall be fitted with a cock or valve directly on the tank capable of being closed from a safe position outside the space concerned in the event of a fire occurring in the space in which such tanks are situated.

In the special case of deep tanks situated in any shaft or pipe tunnel or similar space, valves shall be fitted on the tank but control in the event of fire may be effected by means of an additional valve on the pipe or pipes outside the tunnel or similar space. If such additional valve is fitted in the machinery space, it shall be operated from a position outside this space.

The controls for remote operation of the quick-closing valve for the emergency generator fuel tank are to be in a separate location from other quick-closing valves for fuel tanks.

Pipes conveying oil fuel heated above 60°C shall be placed in sight above the platform in well-lighted parts of machinery spaces, and the number of flanged joints shall be kept to the minimum necessary for mounting purposes.

All valves and cocks forming part of the oil fuel installation shall be capable of being operated from readily accessible positions.

The number of detachable pipe connections shall be limited to those which are necessary for mounting and dismantling purposes.

3.1.7 Safe and efficient means of ascertaining the amount of oil fuel contained in any oil fuel tank shall be provided.

Where sounding pipes are used, they shall not terminate in any space where the risk of ignition of spillage from the sounding pipe might arise. In particular, they shall not terminate in passenger or crew spaces. As a general rule, they shall not terminate in machinery spaces either. However, where ^{Tasneef} considers that this is impracticable, it may permit termination of sounding pipes in machinery spaces on condition that all the following requirements are met:

- a) an oil-level gauge is provided meeting the requirements of 7.3.8;
- b) the sounding pipes terminate in locations remote from ignition hazards unless precautions are taken such as the fitting of effective screens to prevent the oil fuel in the case of spillage through the terminations of the

sounding pipes from coming into contact with a source of ignition;

- c) the terminations of sounding pipes are fitted with self-closing blanking devices and with a smaller diameter self-closing control cock located below the blanking device for the purpose of ascertaining before the blanking device is opened that oil fuel is not present. Provision shall be made so as to ensure that any spillage of oil fuel through the control cock involves no ignition hazard.

3.1.8 Other oil-level gauges may be used in place of sounding pipes. Such means, like those provided in [3.1.7], are subject to the following conditions:

- a) such means shall not require penetration below the top of the tank and their failure or overfilling of the tanks shall not permit release of fuel;

Means prescribed in (a) shall be maintained in the proper condition to ensure their continued accurate functioning in service.

Provision shall be made to prevent overpressure in any oil tank or in any part of the oil fuel system, including the filling pipes if they are joined to pumps on board. Any relief valves and air or overflow pipes shall discharge to a position which is safe. Air pipes from oil fuel tanks shall be led to a safe position on the open deck. They shall not terminate in any place where a risk of ignition is present, and open ends shall be fitted with flame screens of corrosion-resistant material which can be readily removed for cleaning or renewal.

3.1.9

- a) Oil fuel pipes and their valves and fittings shall be of steel or other approved material, and shall comply with the requirements of Pt C; restricted use of flexible pipes is permissible in positions where ^{Tasneef} is satisfied that they are necessary.

Such flexible pipes and end attachments shall be of approved fire-resisting materials of adequate strength and shall be constructed to the satisfaction of ^{Tasneef}

Flexible pipes and end attachments are to comply with the "Rules for the type approval of flexible hoses and expansion joints".

Hose clamps and similar types of attachments for flexible pipes are not permitted.

- b) All external high pressure fuel delivery lines between the high pressure fuel pumps and fuel injectors shall be protected with a jacketed piping system capable of containing fuel from a high pressure line failure. A jacketed pipe incorporates an outer pipe into which the high pressure fuel pipe is placed forming a permanent assembly. The jacketed piping system shall include a means for collection of leakages and arrangements shall be provided for an alarm to be given in the event of a fuel line failure.
- c) Oil fuel lines shall be screened or otherwise suitably protected to avoid, as far as practicable, oil spray or oil leakages onto hot surfaces, into machinery air intakes, or onto other sources of ignition. The number of joints in such piping systems shall be kept to a minimum.

3.1.10 In addition to the provisions of [7.3.8], all tanks used for the storage of oil fuel, together with their fittings, shall be constructed so as to prevent overpressure and spillages due to leakage or overfilling.

3.1.11 Any overflow pipe shall have a bore of at least 1,25 times that of the filling pipe and shall be led to an overflow tank of adequate capacity or to a storage tank having space reserved for overflow purposes. An alarm device shall be provided to give warning when the oil reaches a predetermined level in the tank, or alternatively, a sight glass shall be provided in the overflow pipe to indicate when any tank is overflowing. Such sight glasses shall be placed on vertical pipes only.

3.1.12

- a) Containment provided for areas where frequent leakage may be expected such as oil burners, purifiers, drains and valves under daily service tanks, etc. shall be fitted with adequate drainage. Where drain pipes are provided from collected leakages, they shall be led to a suitable oil drain tank not forming part of an overflow system.
- b) Where boilers are located in machinery spaces in 'tween-decks and the boiler rooms are not separated from the machinery space by watertight bulkheads, the 'tweendecks shall be provided with coamings at least 200 mm in height. This area may be drained to the bilges. The drain tank is not to form part of an overflow system.

3.1.13 Stop valves or cocks shall be fitted on both the suction and delivery sides of oil fuel pumps. All oil fuel pumps shall be provided with pressure relief valves on the discharge side so that the discharged oil may be led to the suction side of the pump.

Pressure relief valves need not be fitted when the system is served only by centrifugal pumps, so designed that the pressure delivered cannot exceed that for which the piping is designed.

3.1.14

- a) Where steam heaters or heaters using other heating media are provided in fuel oil systems, they shall be fitted with at least a high temperature alarm or low flow alarm in addition to a temperature control, except when a dangerous temperature for the ignition of the medium cannot be reached.
- b) When electric heaters are fitted, means shall be provided to ensure that heating elements are permanently submerged during operation.

In any case, in order to avoid a surface temperature of the heating element above 220°C, a safety temperature switch, independent of the automatic control sensor, is to be provided. The safety switch shall cut off the electrical power supply in the event of excessive temperature and shall be provided with manual reset.

3.1.15 All surfaces with temperatures above 220°C which may be impinged as a result of a fuel system failure shall be properly insulated.

4 Arrangements for lubricating oil

4.1

4.1.1 The arrangements for the storage, distribution and utilisation of oil used in pressure lubrication systems shall be such as to ensure the safety of the ship and persons on board. The arrangements made in machinery spaces of category A, and whenever practicable in other machinery spaces, shall comply with at least the provisions of [3.1.2], [3.1.5], [3.1.6], [3.1.7], [3.1.9], a) and (c) and [3.1.15], subject to the following:

- a) this does not preclude the use of sight-flow glasses in lubricating systems provided that they are shown by testing to have a suitable degree of fire resistance;
- b) sounding pipes may be authorised in machinery spaces; the requirements of [7.3.7] (a) and (c) need not be applied on condition that the sounding pipes are fitted with appropriate means of closure.

Air pipes from lubricating oil storage tanks may terminate in the machinery space, provided that the open ends are so situated that issuing oil cannot come into contact with electrical equipment or heated surfaces.

All tanks used for storage of lubricating oil, together with their fittings, shall comply with the requirements of [3.1.10] a) and [3.1.11] and, as far as applicable, also with those of [3.1.12] and [3.1.14].

5 Arrangements for other flammable oils

5.1

5.1.1 The arrangements for the storage, distribution and utilisation of other flammable oils employed under pressure in power transmission systems, control and activating systems and heating systems shall be such as to ensure the safety of the ship and persons on board. In locations where means of ignition are present, such arrangements shall comply with at least the provisions of [3.1.5], [3.1.7], [3.1.9] c) and [3.1.15] and with those of [3.1.8] and [3.1.9] a) in respect of strength and construction.

All tanks used for storage of flammable oils mentioned above, together with their fittings, shall comply with the requirements of [3.1.10] and [3.1.11] and, as far as applicable, also with those of [3.1.12] and [3.1.14].

6 Periodically unattended machinery spaces

6.1

6.1.1 In additions to the requirements of Articles [2], [3], [4] and [5], the oil fuel and lubricating oil systems shall comply with the following:

- a) Where daily service oil fuel tanks are filled automatically, or by remote control, means shall be provided to prevent overflow spillages.

Other equipment which treats flammable liquids automatically, e.g. oil fuel purifiers, which, whenever practicable, shall be installed in a special space reserved for purifiers and their heaters, shall have arrangements to prevent overflow spillages.

- b) Where daily service oil fuel tanks or settling tanks are fitted with heating arrangements, a high temperature alarm shall be provided if the flashpoint of the oil fuel can be exceeded.

7 Prohibition of carriage of flammable oils in the forepeak tank

7.1

7.1.1 Oil fuel, lubricating oil and other flammable oils shall not be carried in the forepeak tank.

8 Thermal oil installations

8.1 General

8.1.1

- a) The inlet and outlet valves of oil fired thermal oil heaters and exhaust fired thermal oil heaters shall be controllable from outside the compartment where they are situated. As an alternative, an arrangement for quick gravity drainage of the thermal oil contained in the system into a collecting tank is acceptable.
- b) Heating of liquid cargoes with flashpoints not exceeding 60°C shall be generally arranged by means of a separate secondary system, located completely within the cargo area. However, a single circuit system may be accepted on the following conditions:
- the system is so arranged that a positive pressure in the coil is at least 3 m water column above the static

head of the cargo when the circulating pump is not in operation,

- the thermal oil system expansion tank is fitted with high and low level alarms,
 - means are provided in the thermal oil system expansion tank for detection of flammable cargo vapours; portable equipment may be accepted;
 - valves for the individual heating coils are provided with a locking arrangement to ensure that the coils are under static pressure at all times.
- c) The thermal oil circulating pumps shall be arranged for emergency stopping from a position outside the space where they are situated.
- d) Vents from expansion tanks and thermal oil storage tanks of thermal oil heating plants shall be led to open deck.

8.2 Exhaust fired thermal oil heaters

8.2.1

- a) The heaters shall be so designed and installed that all tubes may easily and readily be inspected for signs of corrosion and leakage.
- b) Visual inspection and tightness testing of the heater tubes to not less than the working pressure shall be carried out annually, and hydraulic testing shall be carried out every two years.
- c) The heaters shall be fitted with temperature sensor(s) and an alarm for fire detection.
- d) A fixed fire-extinguishing and cooling system shall be fitted. A drenching system providing copious amounts of water may be accepted. The exhaust ducting below the exhaust boiler shall be arranged for adequate collection and drainage so as to prevent water flowing into the internal combustion engine. The drain shall be led to a suitable location.

Part F
Additional Class Notations

Chapter 4

**DAMAGE STABILITY REQUIREMENTS
APPLYING TO PASSENGER SHIPS AND
RO-RO PASSENGER SHIPS**

SECTION 1 DAMAGE STABILITY FOR PASSENGER SHIPS

**SECTION 2 DAMAGE STABILITY REQUIREMENTS FOR SHIPS CARRYING
DANGEROUS GOODS**

**SECTION 3 DAMAGE STABILITY REQUIREMENTS FOR CARGO SHIPS
LONGER THAN 110 METERS**

SECTION 1

DAMAGE STABILITY FOR PASSENGER SHIPS

1 General

1.1 Application

1.1.1 Where for passenger ships an additional class notation is requested, the assessment of the stability in damaged condition shall be assessed according to the requirements given in this Section.

Passenger ships complying with the requirements of this Section are eligible for the assignment of the additional class notation **DMS**.

1.1.2 Interested Parties are requested to prove, by means of a calculation based on the method of lost buoyancy, that the damage stability of the vessel is appropriate in the event of flooding. All calculations are to be carried out free to trim and sinkage.

1.1.3 Buoyancy of the vessel in the event of flooding is to be proven for the standard load conditions specified in Part B, Ch 6, Sec 2, [3.1]. Accordingly, mathematical proof of sufficient stability is to be determined for the three intermediate stages of flooding (25%, 50% and 75% of flood build-up) and for the final stage of flooding.

2 Assumption

2.1

2.1.1 Passenger vessels authorised to carry up to a maximum of 500 passengers do not need to have two-compartment status.

The following assumptions concerning the extent of damage are to be taken into account in the event of flooding:

a) Side damage

Table 1

	1-compartment status	2-compartment status
longitudinal l (m)	0,10 LWL, however not less than 4,00 m	0,05 LWL, however not less than 2,25 m
transverse b (m)	B/5	0,59
vertical h (m)	from vessel bottom to top without delimitation	from vessel bottom to top without delimitation

b) Bottom damage

Table 2

	1-compartment status	2-compartment status
longitudinal l (m)	0,10 LWL, however not less than 4,00 m	0,05 LWL, however not less than 2,25 m
transverse b (m)	B/5	0,59
vertical h (m)	0,59; pipework is to be deemed intact (1)	0,59; pipework is to be deemed intact (1)
(1) Where a pipework system has no open outlet in a compartment, the pipework is to be regarded as intact in the event of this compartment being damaged, if it runs within a safe area and is more than 0,50 m off the bottom of the vessel.		

- a) For one-compartment status the bulkheads can be assumed to be intact if the distance between two adjacent bulkheads is greater than the damage length. Longitudinal bulkheads at a distance of less than B/3 from the outer plating measured perpendicular to the centreline from the shell plating at the maximum draught are not to be taken into account for calculation purposes.
- b) For two-compartment status, each bulkhead within the extent of damage will be assumed to be damaged. This means that the position of the bulkheads is to be selected in such a way as to ensure that the passenger vessel remains buoyant after flooding of two or more adjacent compartments in the longitudinal direction.
- c) The lowest point of every non-watertight opening (e.g. doors, windows, access hatchways) is to lie at least 0,10 m above the damaged waterline. The bulkhead deck is not to be immersed in the final stage of flooding.
- d) Permeability is assumed to be 95%. If it is proven by a calculation that the average permeability of any compartment is less than 95%, the calculated value can be used instead. The values to be adopted are to be not less than those in Tab 3.
- e) If damage of a smaller dimension than specified in Tab 3 produces more detrimental effects with respect to heeling or loss of metacentric height, such damage is to be taken into account for calculation purposes.

Table 3

Spaces	Permeability
Lounges	95%
Engine and boiler rooms	85%
Luggage and storerooms	75%
Double bottoms, fuel bunkers, ballast and other tanks, depending on whether, according to their intended purpose, they are to be assumed to be full or empty for the vessel floating at the plane of maximum draught	0% or 95%

3 Damage stability criteria

3.1

3.1.1 For all intermediate stages of flooding referred to in [1.1.3], the following criteria are to be met:

- a) the heeling angle φ at the equilibrium position of the intermediate stage in question is not to exceed 15° ;
- b) beyond the heel in the equilibrium position of the intermediate stage in question, the positive part of the righting lever curve is to display a righting lever value of GZ

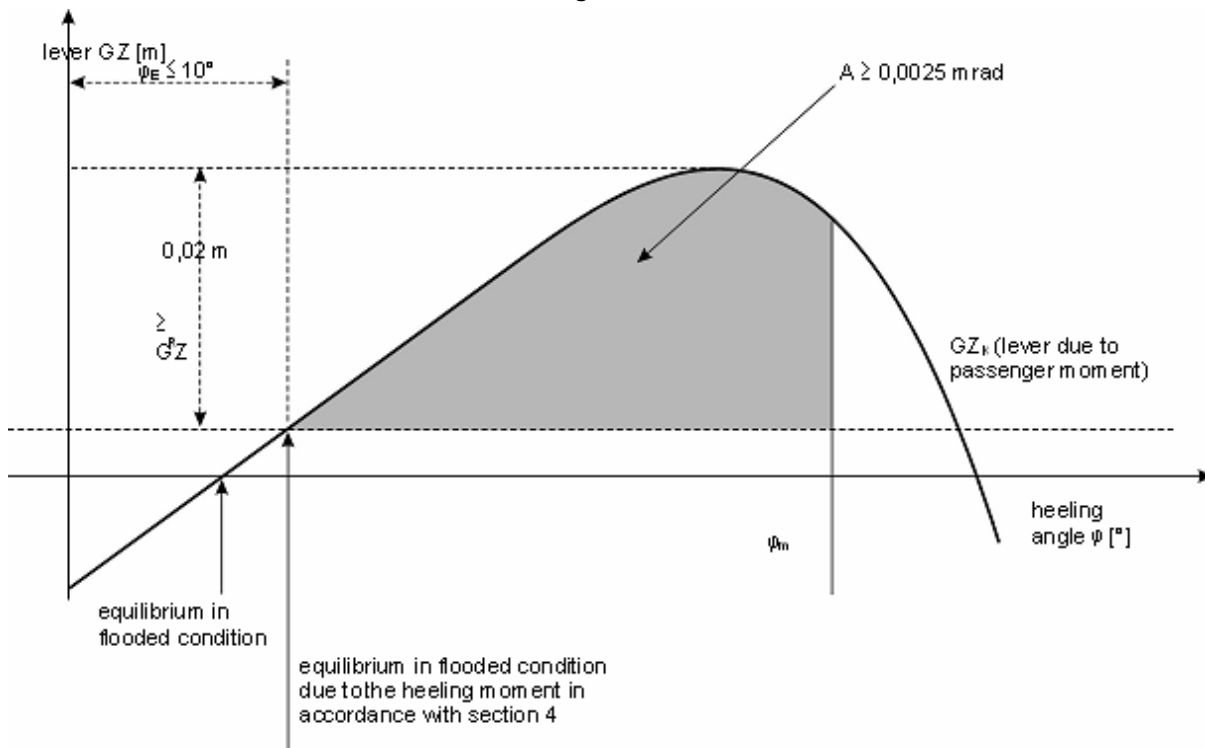
$\geq 0,02$ m before the first unprotected opening becomes immersed or a heeling angle φ of 25° is reached;

- c) non-watertight openings are not to be immersed before the heel in the equilibrium position of the intermediate stage in question has been reached.
- d) the calculation of the free surface effect in all intermediate stages of flooding is to be based on the gross surface area of the damaged compartments.

3.1.2 During the final stage of flooding, the following criteria are to be met taking into account the heeling moment due to persons in accordance with Part B, Ch 6, Sec 2, [3.1.8]:

- a) the heeling angle φ_E is not to exceed 10° ;
- b) beyond the equilibrium position the positive part of the righting lever curve is to display a righting lever value of $GZ_R \geq 0,02$ m with an area $A \geq 0,0025$ mrad. These minimum values for stability are to be met until the immersion of the first unprotected opening, or the angle of vanishing stability if lesser, and in any case before reaching a heeling angle φ not more than 25° .
- c) non-watertight openings are not to be immersed before the equilibrium position has been reached; if such openings are immersed before this point, the rooms affording access are deemed to be flooded for damage stability calculation purposes.

Figure 1



φ_E : is the heeling angle in the final stage of flooding with regard to the moment in accordance with Pt B, Ch 6, Sec 2, [3.1.8];

φ_m : is the angle of vanishing stability or the angle at which the first unprotected opening immerses or 25° ; whichever is less is to be used;

GZ_R : is the remaining righting lever in the final stage of flooding in accordance with [3.1.2)b);

GZ_k : is the heeling lever resulting from the moment in accordance with Pt B, Ch 6, Sec 2, [3.1.8].

3.1.3 The shut-off devices which are to be able to be closed watertight are to be marked accordingly.

3.1.4 If cross-flood openings to reduce asymmetrical flooding are provided, they are to meet the following conditions:

- a) for the calculation of cross-flooding, IMO Resolution A.266 (VIII) is to be applied;
- b) they are to be self-acting;
- c) they are not to be equipped with shut-off devices;
- d) the total time allowed for compensation is not to exceed 15 minutes.

4 Derogations for passenger vessels of length not greater than 25 m

4.1

4.1.1 As an alternative to proving adequate stability after damage in accordance with [1.1.2] to [3.1.4], passenger

vessels with a length of not more than 25 m and authorised to carry up to a maximum of 50 passengers are to comply with the following criteria:

- a) after symmetrical flooding, the immersion of the vessel is not to exceed the margin line; and
- b) the metacentric height G_{mt} is to be not less than 0,10 m.

The necessary residual buoyancy is to be ensured through the appropriate choice of material used for the construction of the hull or by means of highly cellular foam floats, solidly attached to the hull. In the case of vessels with a length of more than 15 m, residual buoyancy can be ensured by a combination of floats and subdivision complying with the 1-compartment status as stated above.

SECTION 2

DAMAGE STABILITY REQUIREMENTS FOR SHIPS CARRYING DANGEROUS GOODS

1 Damage stability requirements for tankers carrying dangerous goods (Type C and Type N Tankers)

1.1 Application

1.1.1 Proof of sufficient stability shall be furnished, including stability in damaged condition.

1.1.2 The basic values for the stability calculation - the vessel's lightweight and location of the centre of gravity - shall be determined either by means of an inclining experiment or by detailed mass and moment calculation. In the latter case the lightweight of the vessel shall be checked by means of a lightweight test with a tolerance limit of $\pm 5\%$ between the mass determined by calculation and the displacement determined by the draught readings.

1.1.3 Floatability after damage shall be proven for the most unfavourable loading condition. For this purpose, calculated proof of sufficient stability shall be established for critical intermediate stages of flooding and for the final stage of flooding. Negative values of stability in intermediate stages of flooding may be accepted only if the continued range of curve of righting lever in damaged condition indicates adequate positive values of stability.

1.2 Stability (damaged condition)

1.2.1 The following assumptions shall be taken into consideration for the damaged condition:

- a) The extent of side damage is as follows:
 - longitudinal extent: at least 0,10 L, but not less than 5,00 m;
 - transverse extent: 0,79 m;
 - vertical extent: from the base line upwards without limit.
- b) The extent of bottom damage is as follows:
 - longitudinal extent: at least 0,10 L, but not less than 5,00 m;
 - transverse extent: 3,00 m;
 - vertical extent: from the base line 0,59 m upwards, the sump excepted.
- c) Any bulkheads within the damaged area shall be assumed damaged, which means that the location of bulkheads shall be chosen so as to ensure that the vessel remains afloat after the flooding of two or more adjacent compartments in the longitudinal direction.

1) The following provisions are applicable:

- For bottom damage, adjacent athwartship compartments shall also be assumed as flooded;
- The lower edge of any non-watertight openings (e.g. doors, windows, access hatchways) shall, at the final stage of flooding, be not less than 0,10 m above the damage waterline;

In general, permeability shall be assumed to be 95%. Where an average permeability of less than 95% is calculated for any compartment, this calculated value may be used. However, the following minimum values shall be used:

- engine rooms: 85%
- accommodation: 95%
- double bottoms, fuel oil tanks, ballast tanks etc., depending on whether, according to their function, they are to be assumed as full or empty for the vessel floating at the maximum permissible draught: 0% or 95%.

For the main engine room only the one-compartment standard need be taken into account, i.e. the end bulkheads of the engine room shall be assumed as not damaged.

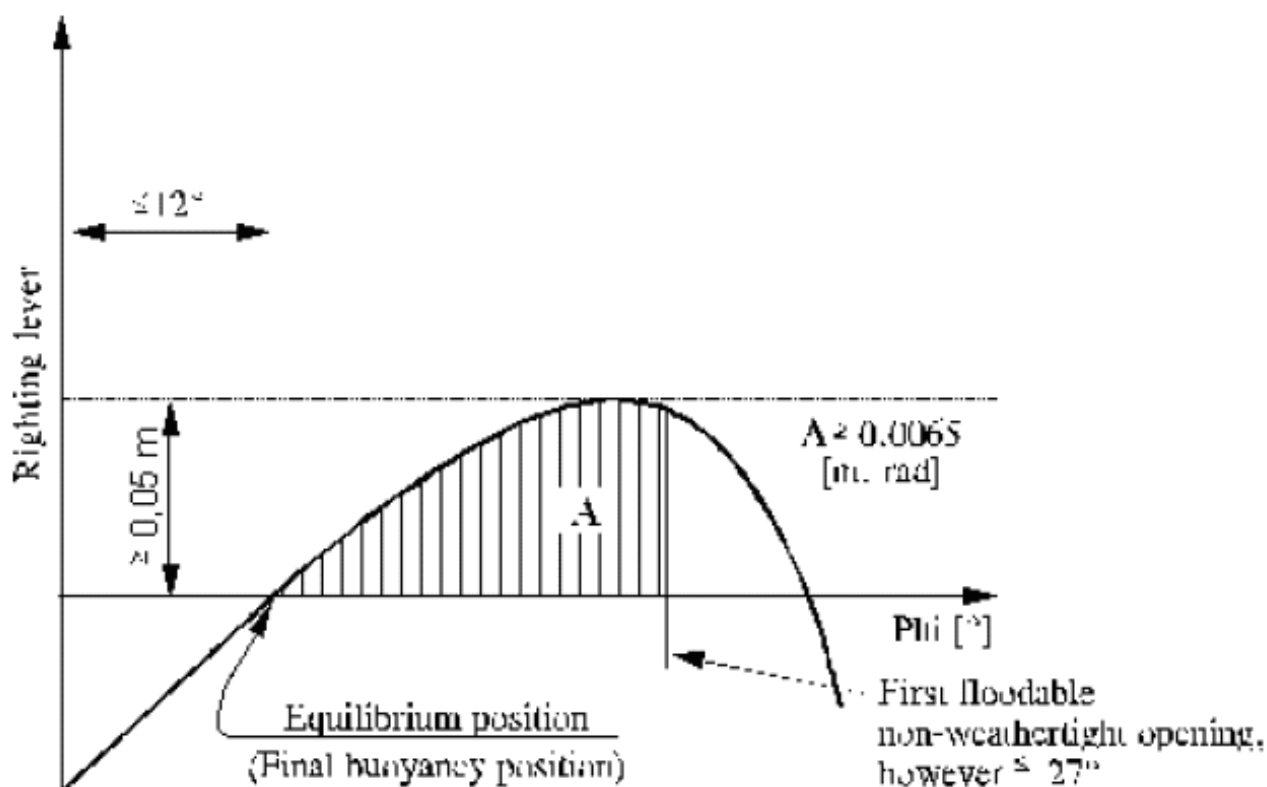
2) At the stage of equilibrium (final stage of flooding), the angle of heel shall not exceed 12° . Non-watertight openings shall not be flooded before reaching the stage of equilibrium. If such openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purpose of the stability calculation.

The positive range of the righting lever curve beyond the stage of equilibrium shall have a righting lever equal to or greater than 0,05 m in association with an area under the curve equal to or greater than 0,0065 m.rad.

The minimum values of stability shall be satisfied up to immersion of the first non-weather-tight opening and, in any event, up to an angle of heel equal to or less than 27° . If non-weather-tight openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purposes of stability calculation.

- 3) If openings through which undamaged compartments may additionally become flooded are capable of being closed watertight, the closing appliances shall be marked accordingly.
- 4) Where cross- or down-flooding openings are provided for reduction of unsymmetrical flooding, the time for equalisation shall not exceed 15 minutes, if during the intermediate stages of flooding sufficient stability has been proven.

Figure 1



2 Damage stability requirements for tankers carrying dangerous liquefied gasses (Type G Tankers)

2.1 General

2.1.1 The requirements stated in [1] are to be applied.

3 Damage stability requirements for cargo ships carrying dry dangerous goods

3.1 General

3.1.1 The requirements given in [2.1.1] are to be complied with.

3.2 Stability (damaged condition)

3.2.1 The following assumptions shall be taken into consideration for the damaged condition:

- a) The extent of side damage is as follows:
- longitudinal extent: at least 0,10 L, but not less than 5,00 m;
 - transverse extent: 0,59 m;
 - vertical extent: from the base line upwards without limit.

b) The extent of bottom damage is as follows:

- longitudinal extent: at least 0,10 L, but not less than 5,00 m;
- transverse extent: 3,00 m;
- vertical extent: from the base line 0,49 m upwards, the sump excepted.

c) Any bulkheads within the damaged area shall be assumed damaged, which means that the location of bulkheads shall be chosen so as to ensure that the vessel remains afloat after the flooding of two or more adjacent compartments in the longitudinal direction.

The following provisions are applicable:

- 1) For bottom damage, adjacent athwartship compartments shall also be assumed as flooded;
- 2) The lower edge of any non-watertight openings (e.g. doors, windows, access hatchways) shall, at the final stage of flooding, be not less than 0,10 m above the damage waterline;
- 3) In general, permeability shall be assumed to be 95%. Where an average permeability of less than 95% is calculated for any compartment, this calculated value may be used. However, the following minimum values shall be used:
 - engine rooms: 85%
 - accommodation: 95%
 - double bottoms, fuel oil tanks, ballast tanks etc., depending on whether, according to their function, they are to be assumed as full or empty for

the vessel floating at the maximum permissible draught: 0% or 95%.

- 4) For the main engine room only the one-compartment standard need be taken into account, i.e. the end bulkheads of the engine room shall be assumed as not damaged.

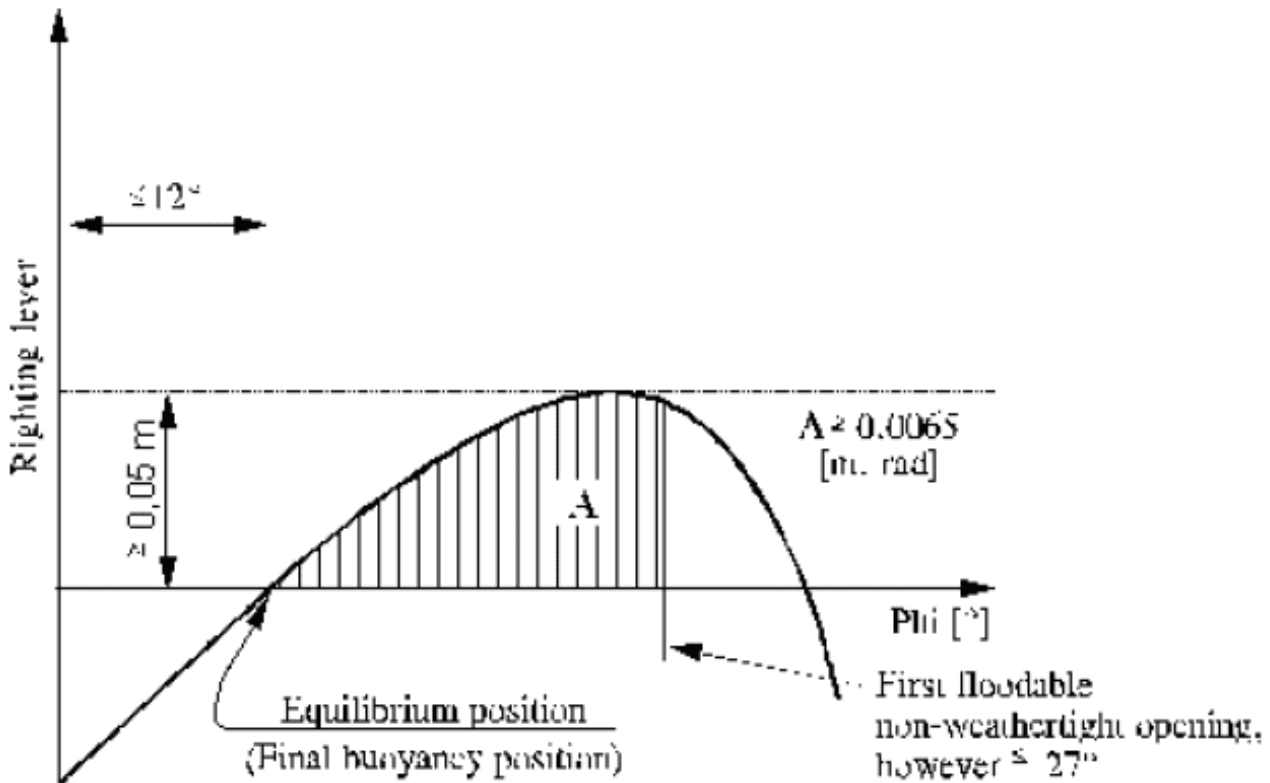
3.2.2 At the stage of equilibrium (final stage of flooding), the angle of heel shall not exceed 12°. Non-watertight openings shall not be flooded before reaching the stage of equilibrium. If such openings are immersed before that

stage, the corresponding spaces shall be considered as flooded for the purpose of the stability calculation.

The positive range of the righting lever curve beyond the stage of equilibrium shall have a righting lever equal to or greater than 0,05 m in association with an area under the curve equal to or greater than 0,0065 m.rad.

The minimum values of stability shall be satisfied up to immersion of the first non-weather-tight opening and, in any event, up to an angle of heel equal to or less than 27°. If non-weather-tight openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purposes of stability calculation.

Figure 2



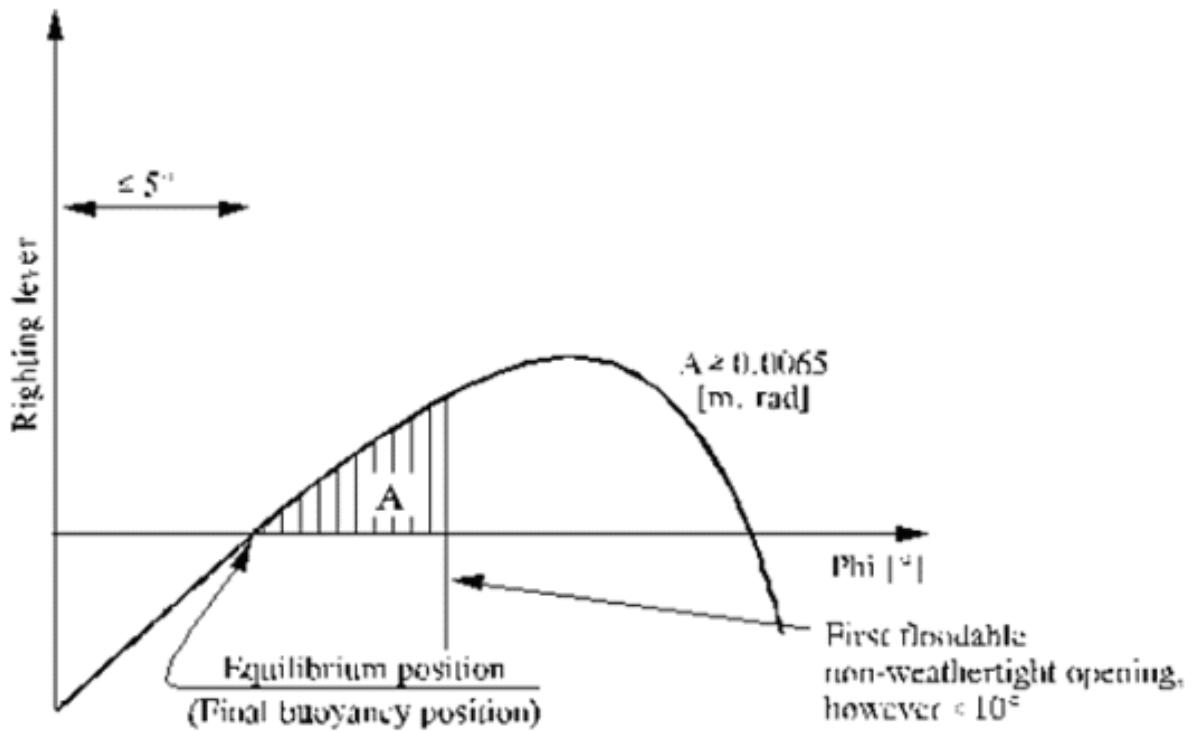
3.2.3 Inland navigation vessels carrying containers which have not been secured shall satisfy the following damage stability criteria:

At the stage of equilibrium (final stage of flooding) the angle of heel shall not exceed 5°. Non-watertight openings shall not be immersed before reaching the stage of equilibrium.

If such openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purpose of stability calculation.

The positive range of the righting lever curve beyond the position of equilibrium shall have an area under the curve equal to or greater than 0,0065 m.rad. The minimum values of stability shall be satisfied up to immersion of the first non-weather-tight opening and, in any event, up to an angle of heel equal to or less than 10°. If non-weather-tight openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purposes of stability calculation.

Figure 3



3.2.4 If openings through which undamaged compartments may become additionally flooded are capable of being closed watertight, the closing devices shall be appropriately marked.

3.2.5 Where cross- or down-flooding openings are provided for reduction of unsymmetrical flooding, the time for equalisation shall not exceed 15 minutes, if during the intermediate stages of flooding sufficient stability has been proven.

SECTION 3

DAMAGE STABILITY REQUIREMENTS FOR CARGO SHIPS LONGER THAN 110 METRES

1 General

1.1 Damage stability criteria

1.1.1 The proof of sufficient stability is to be verified for the most unfavourable loading condition.

1.1.2 The basic values for the stability calculation, the vessel's lightweight and the location of the centre of gravity are to be determined:

- either by means of a heeling experiment, or
- by detailed mass and moment calculation, in which case the lightweight of the vessel is to be verified by checking the draught, with a tolerance limit of +/- 5 % between the mass determined by calculation and the displacement determined by the draught readings.

1.1.3 The proof of buoyancy after damage is to be verified for the fully laden craft.

For this purpose, calculated proof of sufficient stability is to be established for the critical intermediate stages of flooding and for the final stage of flooding. Negative values of stability in intermediate stages of flooding may be accepted if sufficient stability in subsequent intermediate stages is verified.

1.1.4 The following assumptions are to be taken into consideration for the damaged condition:

- a) Extent of side damage:
 - longitudinal extent: at least 0,10 L;
 - transverse extent: 0,59 m;
 - vertical extent: from the base line upwards without limit.
- b) Extent of bottom damage:
 - longitudinal extent: at least 0,10 L;
 - transverse extent: 3,00 m ;
 - vertical extent: from the base 0,39 upwards without limit.
- c) Any bulkheads within the damaged area are to be assumed damaged, which means that the subdivision is to be chosen so that the vessel remains afloat after the flooding of two or more adjacent compartments in the longitudinal direction.

For the main engine room only the one-compartment standard needs to be taken into account, i.e. the end bulkheads of the engine room are to be assumed as not damaged.

For bottom damage, adjacent athwartship compartments are also to be assumed as flooded.

d) Permeability

Permeability is to be assumed to be 95%.

By way of derogation from this assumption, the following permeability may be assumed:

- engine and operation rooms: 85%
- double bottoms, fuel tanks, ballast tanks etc., depending on whether, according to their function, they are to be assumed as full or empty for the vessel floating at the maximum permissible draught: 0% or 95%.

If a calculation proves that the average permeability of any compartment is lower, the calculated value may be used.

e) The lower edge of any non-watertight openings (e.g. doors, windows, access hatches) is, at the final stage of flooding, to be not less than 100 mm above the damaged waterline.

1.1.5 The stability after damage is sufficient if, on the basis of the assumptions in [1.1.4]:

- a) at the final stage of flooding a safety clearance of not less than 100 mm remains and the heeling angle of the craft does not exceed 5°; or
- b) calculations in accordance with the procedure for calculation of damage stability specified in Part 9 of the ADN produce a positive result.

1.1.6 When cross- or down-flooding openings are provided for reduction of asymmetrical flooding, the time for equalisation is not to exceed 15 minutes, if during the intermediate stages of flooding sufficient damage stability has been verified.

1.1.7 If openings through which undamaged compartments may additionally become flooded are capable of being closed watertight, the closing appliances are to be marked according to their operating instructions.

1.1.8 The proof by calculation in accordance with [1.1.2] to [1.1.5] is to be considered to have been provided if damage stability calculations in accordance with Part 9 of the ADN are produced with a positive result.

1.1.9 Where necessary in order to meet the requirements in [1.1.2] or [1.1.3], the plane of maximum draught is to be re-established.

Part F
Additional Class Notations

Chapter 5

ADDITIONAL RULES FOR ALL TYPE OF SHIPS

SECTION 1 SHAFT MONITORING (MON-SHAFT)

**SECTION 2 IN-WATER SURVEY ARRANGEMENTS
(INWATERSURVEY)**

SECTION 1

SHAFT MONITORING (MON-SHAFT)

1 General

1.1 Applicability of MON-SHAFT notation

1.1.1 The additional class notation **MON-SHAFT** is assigned, in accordance with Pt A, Ch 1, Sec 2, [6.5], to ships complying with the requirements of this Section.

1.1.2 This notation is assigned only to ships having tailshafts arranged with oil lubricated stern bearing and with approved oil sealing glands.

1.1.3 The assignment of this notation allows a reduced scope for complete tailshaft surveys; see Pt A, Ch 3, Sec 5, [1.2.2].

2 Requirements for the issuance of the notation

2.1 Arrangement

2.1.1 In order for the notation **MON-SHAFT** to be granted, the stern bearing is to be arranged with facilities for measurement of bearing wear down.

2.2 Lubricating oil analysis

2.2.1 Item to be monitored

In order for the notation **MON-SHAFT** to be granted, the lubricating oil of the stern bearing is to be analysed as indicated in this Section.

2.2.2 Timing

Stern bearing lubricating oil is to be analysed regularly; in any event, the interval between two subsequent analyses is not to exceed six months.

2.2.3 Records

The lubricating oil analysis documentation is to be available on board, showing in particular the trend of the parameters measured according to [2.2.4].

2.2.4 Content of analysis

Each analysis is to include the following parameters:

- water content
- chloride content
- bearing material and metal particle content
- oil ageing (resistance to oxidation).

The oil samples are to be taken under service conditions and are to be representative of the oil within the sterntube.

2.2.5 Additional data to be recorded

In addition to the results of the oil sample analysis, the following data are to be regularly recorded:

- oil consumption
- bearing temperatures (a temperature sensor for each bearing or other approved arrangements are to be provided).

SECTION 2

IN-WATER SURVEY ARRANGEMENTS (INWATERSURVEY)

1 General

1.1 Application

1.1.1 The additional class notation **INWATERSURVEY** is assigned, in accordance with Pt A, Ch 1, Sec 2, [6.6.1].

1.2 Documentation to be submitted

1.2.1 Plans

Detailed plans of the hull and hull attachments below the waterline are to be submitted to the Society in triplicate for approval. These plans are to indicate the location and/or the general arrangement of:

- all shell openings
- stem
- rudder and fittings
- sternpost
- propeller, including the means used for identifying each blade
- anodes, including securing arrangements
- bilge keels
- welded seams and butts.

The plans are also to include the necessary instructions to facilitate the divers' work, especially for taking clearance measurements.

Moreover, a specific detailed plan showing the systems to be adopted, when the ship is floating, in order to assess the slack between pintles and gudgeons is to be submitted to the Society in triplicate for approval.

1.2.2 Photographs (1/1/2022)

As far as practicable, photographic documentation, used as a reference during the in-water surveys, of the following hull parts is to be submitted to the Society:

- propeller boss
- rudder pintles, where slack is measured
- typical connections to the water
- directional propellers, if any
- other details, as deemed necessary by the Society on a case-by-case basis.

1.2.3 Documentation to be kept on board

The Owner is to keep on board the ship the plans and documents given in [1.2.1] and [1.2.2], and they are to be made available to the Surveyor and the divers when an in-water survey is carried out.

2 Structure design principles

2.1

2.1.1 Marking

Identification marks and system are to be supplied to facilitate the in-water survey. In particular, the positions of transverse watertight bulkheads are to be marked on the hull.

2.1.2 Rudder arrangements

Rudder arrangements are to be such that rudder pintle clearances and fastening arrangements can be checked.

2.1.3 Tailshaft arrangements

Tailshaft arrangements are to be such that clearances (or wear down by poker gauge) can be checked.