ACCOMMODATION
Design and Construction of Crew Accommodation in respect of Title 3 of Maritime Labour Convention 2006

July 2012

Guidance Note
NI 577 DT R00 E
**ARTICLE 1**

1.1. - BUREAU VERITAS is a Society the purpose of whose Marine Division (the "Society") is the classification ("Classification") of any ship or vessel or structure of any type or part of it or system therein collectively hereinafter referred to as a "Unit" whether linked to shore, river bed or sea bed or not, whether operated or located at sea or in inland waters or partly on land, including submarines, hovercrafts, drilling rigs, offshore installations of any type and of any purpose, their related and ancillary equipment, subsists or not, such as well head and pipelines, mooring legs and mooring points or otherwise as decided by the Society.

The Society:
- prepares and publishes Rules for classification, Guidance Notes and other documents ("Rules");
- issues Certificates, Attestations and Reports following its interventions ("Certificates");
- publishes Registers.

1.2. - The Society also participates in the application of National and International Regulations or Standards, in particular by delegation from different Governments. Those activities are hereafter collectively referred to as "Certification".

1.3. - The Society can also provide services related to Classification and Certification such as ship and company safety management certification, ship and port security certification, training activities; all activities and duties incidental thereto such as documentation on any supporting means, software, instrument, measurements, tests and trials on board.

1.4. - The interventions mentioned in 1.1., 1.2. and 1.3. are referred to as "Services".

1.5. - The Society is neither and may not be considered as an Underwriter, Broker in ship's sale or chartering, Expert in Unions valuation, Consulting Engineer, Controller, Naval Architect, Manufacturer, Shipbuilder, Repair yard, Charterer or Shipowner who are not relieved of any of their expressed or implied obligations by the interventions of the Society.

**ARTICLE 2**

2.1. - Certification is the appraisement given by the Society for its Client, at a certain date, following surveys by its Surveyors along the lines specified in Articles 3 and 4 hereafter on the level of compliance of the Unit to its Rules or part of them. This appraisement is represented by a class entered on the Certificates and periodically transcribed in the Society’s Register.

2.2. - Certification is carried out by the Society along the same lines as set out in Articles 3 and 4 hereafter and reference to the applicable National and International Regulations or Standards.

2.3. - It is incumbent upon the Client to maintain the condition of the Unit after surveys, to present the Unit for surveys and to inform the Society without delay of circumstances which may affect the given appraisal or cause to modify its scope.

2.4. - The Client is to give to the Society access and information necessary for the safe and efficient performance of the requested Services. The Client is the sole responsible for the conditions of presentation of the Unit for tests, trials and surveys and the conditions under which tests and trials are carried out.

**ARTICLE 3**

3.1. - The Rules, procedures and instructions of the Society take into account at the date of their preparation the state of currently available and proven technical knowledge of the Industry. They are not a standard or a code of construction neither a guide for maintenance, a safety handbook or a guide of professional practices, all of which are assumed to be known in detail and carefully followed at all times by the Client.

Committees consisting of personalities from the Industry contribute to the development of those documents.

3.2. - The Society only is qualified to apply its Rules and to interpret them. Any reference to them has no effect unless it involves the Society’s intervention.

3.3. - The Services of the Society are carried out by professional Surveyors according to the applicable Rules and to the Code of Ethics of the Society. Surveyors have authority to decide locally on matters related to classification and certification of the Units, unless the Rules provide otherwise.

3.4. - The operations of the Society in providing its Services are exclusively conducted by way of random inspections and do not in any circumstances involve monitoring or exhaustive verification.

**ARTICLE 4**

4.1. - The Society, acting by reference to its Rules:
- reviews the construction arrangements of the Units as shown on the documents presented by the Client;
- conducts surveys at the place of their construction;
- classes Units and enters their class in its Register;
- surveys periodically the Units in service to note that the requirements for the maintenance of class are met.

The Client is to inform the Society without delay of circumstances which may cause the date or the extent of the surveys to be changed.

**ARTICLE 5**

5.1. - The Society acts as a provider of services. This cannot be construed as an obligation bearing on the Society to obtain a result or as a warranty.

5.2. - The certificates issued by the Society pursuant to 5.1. here above are a statement on the level of compliance of the Unit to its Rules or to the documents of reference for the Services provided for.

In particular, the Society does not engage in any work relating to the design, building, production or repair checks, neither in the operation of the Units or in their trade, neither in any advisory services, and cannot be held liable on those accounts. Its certificates cannot be construed as an implied warranty of fitness for the purpose, seaworthiness of the Unit or of its value for sale, insurance or chartering.

5.3. - The Society does not declare the acceptance or commissioning of a Unit, nor of its construction in conformity with its design, that being the exclusive responsibility of its owner or builder, respectively.

**ARTICLE 6**

6.1. - The Society accepts no responsibility for the use of information related to its Services which was not provided for the purpose by the Society or with its assistance.

6.2. - If the Services of the Society cause to the Client a damage which is proved to be the direct and reasonably foreseeable consequence of an error or omission of the Society, its liability towards the Client is limited to ten times the amount of fee paid for the Service having caused the damage, provided however that this limit shall be subject to a minimum of eight thousand (8,000) Euro, and to a maximum of a half times the client’s fee paid for the Service or a sum of eight hundred thousand (800,000) Euro and one and a half times the above mentioned fee.

The Society bears no liability for indirect or consequential loss such as e.g. loss of revenue, loss of profit, loss of production, loss relative to other contracts and indemnities for termination of other agreements.

6.3. - All claims are to be presented to the Society in writing within three months of the date when the Services were supplied or (if later) the date when the events which are relied on of were first known to the Client, and any claim which is not so presented shall be deemed waived and absolutely barred. Time is to be interrupted thereafter with the same periodicity.

**ARTICLE 7**

7.1. - Requests for Services are to be in writing.

7.2. - Either the Client or the Society can terminate as of right the requested Services after giving the other party thirty days’ written notice, for convenience, and without prejudice to the provisions in Article 8 hereunder.

7.3. - The class granted to the concerned Units and the previously issued certificates remain valid until the date of effect of the notice issued according to 7.2. here above subject to compliance with 2.3. here above and Article 8 hereunder.

7.4. - The contract for classification and/or certification of a Unit cannot be transferred neither assigned.

**ARTICLE 8**

8.1. - The Services of the Society, whether completed or not, involve, for the part carried out, the payment of fees upon receipt of the invoice and the reimbursement of the expenses incurred.

8.2. - Overdue amounts are increased as of right by interest in accordance with the applicable legislation.

8.3. - The class of a Unit may be suspended in the event of non-payment of fee after a first unfuition notification to pay.

**ARTICLE 9**

9.1. - The documents and data provided to or prepared by the Society for its Services, and the information available to the Society, are treated as confidential. However:
- clients have access to the data they have provided to the Society and, during the period of classification of the Unit for them, to the classification file consisting of survey reports and certificates which have been prepared at any time by the Society for the classification of the Unit;
- copy of the documents made available for the classification of the Unit and of available survey reports can be handed over to another Classification Society, where appropriate, in case of the Unit’s transfer of class;
- the data relative to the evolution of the Register, to the class suspension and to the survey status of the Units, as well as general technical information related to hull and equipment damages, are passed on to IACS (International Association of Classification Societies) according to the association working rules;
- the certificates, documents and information relative to the Units classed with the Society may be reviewed during certificating bodies audits and are disclosed upon order of the concerned governmental or inter-governmental authorities or of a Court having jurisdiction.

The documents and data are subject to a file management plan.

**ARTICLE 10**

10.1. - Any delay or shortcoming in the performance of its Services by the Society arising from an event not reasonably foreseeable by or beyond the control of the Society shall be deemed not to be a breach of contract.

**ARTICLE 11**

11.1. - In case of diverging opinions during surveys between the Client and the Society’s surveyor, the Society may designate another of its surveyors at the request of the Client.

11.2. - Disagreements of a technical nature between the Client and the Society can be submitted by the Society to the advice of its Marine Advisory Committee.

**ARTICLE 12**

12.1. - Disputes over the Services carried out by delegation of Governments are assessed within the framework of the applicable agreements with the States, international Conventions and national rules.

12.2. - Disputes arising out of the payment of the Society’s invoices by the Client are submitted to the Court of Nanterre, France.

12.3. - Other disputes over the present General Conditions or over the Services of the Society are exclusively submitted to arbitration, by three arbitrators, in London according to the Arbitration Act 1996 or any statutory modification or re-enactment thereof. The contract between the Society and the Client shall be governed by English law.

**ARTICLE 13**

13.1. - These General Conditions constitute the sole contractual obligations binding together the Society and the Client, to the exclusion of all other representation, statements, terms, conditions whether express or implied. They may be varied in writing by mutual agreement.

13.2. - The invalidity of one or more stipulations of the present General Conditions does not affect the validity of the remaining provisions.

13.3. - The definitions herein take precedence over any definitions serving the same purpose which may appear in other documents issued by the Society.
ACCOMMODATION
Design and Construction of Crew Accommodation in respect of Title 3 of Maritime Labour Convention 2006

SECTION 1 GENERAL REQUIREMENTS
SECTION 2 DETAILED REQUIREMENTS
Preamble

The purpose of this Guidance Note is to provide classification interpretation of the design and construction of accommodation provisions as required by Title 3 "Accommodation, Recreational facilities, Food and Catering" of the ILO Maritime Labour Convention 2006. This Guidance Note is intended to be used in the case when the Owners of the vessel are requesting the additional class notation ACCOMMODATION. The criteria provided in this Guidance Note are based on established international standards and practices for health and safety onboard in line with the requirements of the ILO Maritime Labour Convention 2006 (the "Convention"). Unless indicated otherwise, the terms and definitions are those of this Convention or other international maritime conventions in force, to which the reader is invited to refer. Bureau Veritas taking into account the wide range of mandatory rules and regulations in force, in no way intends to replace any of these requirements, nor do any of the requirements of this Guidance Note relieve any other party of their responsibility to comply with the requirement of mandatory rules and regulations as required. This Guidance Note is issued in the scope of the Marine Division General Conditions.
# Section 1  General Requirements

<table>
<thead>
<tr>
<th>1. General</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Scope</td>
<td></td>
</tr>
<tr>
<td>1.2 Class notation - granting and maintenance</td>
<td></td>
</tr>
<tr>
<td>1.3 Equivalents and alternatives</td>
<td></td>
</tr>
</tbody>
</table>

# Section 2  Detailed Requirements

<table>
<thead>
<tr>
<th>1</th>
<th>Accommodation design</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>General design requirements</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>Sleeping accommodation</td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>Sleeping accommodation - Special arrangements on passenger ships or special purpose ships</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>Mess rooms</td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td>Sanitary facilities</td>
<td></td>
</tr>
<tr>
<td>1.7</td>
<td>Hospital accommodation</td>
<td></td>
</tr>
<tr>
<td>1.8</td>
<td>Miscellaneous</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2</th>
<th>Vibration prevention</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>Design requirements</td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>Testing</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th>Noise prevention</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td>Design requirements</td>
<td></td>
</tr>
<tr>
<td>3.3</td>
<td>Testing</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4</th>
<th>Ventilation, heating and air conditioning</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>4.2</td>
<td>Design requirements</td>
<td></td>
</tr>
<tr>
<td>4.3</td>
<td>Testing</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5</th>
<th>Lighting</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>5.2</td>
<td>Design requirements</td>
<td></td>
</tr>
<tr>
<td>5.3</td>
<td>Testing</td>
<td></td>
</tr>
</tbody>
</table>
SECTION 1 GENERAL REQUIREMENTS

1 General

1.1 Scope

1.1.1 This Guidance Note covers the requirements for crew Accommodation and Recreational facilities of the Convention (Reg 3.1) in so far as the following aspects are concerned:

• Accommodation Design
• Vibration
• Noise
• Indoor Climate
• Lighting

The Guidance Note does not cover the requirements for Food and Catering (Reg 3.2 of the Convention).

1.2 Class notation - granting and maintenance

1.2.1 The class notation ACCOMMODATION may be assigned, upon request of the shipowner, to the vessels found to be in compliance with the criteria of the Convention and the provisions contained in this Guidance Note.

Maintenance of the notation is subject to satisfactory annual and renewal surveys at the end of term in the scope defined in NR467 Rules for Classification of Steel Ships, Part A, Ch 5, Sec 10.

1.3 Equivalents and alternatives

1.3.1 National requirements

In case of a discrepancy between the national regulations and the provisions of the present Guidance Note, the former always takes precedence. However the Society reserves the right to call for the necessary adaptation to preserve the intention of this Guidance Note.

1.3.2 Technical alternatives

When authorized by the Administration, the Society will consider alternative arrangements and criteria for compliance with this Guidance Note, proposed by the interested parties always on behalf of the owner, provided that their relevance has been demonstrated through sound engineering analysis or service experience.
SECTION 2  DETAILED REQUIREMENTS

1 Accommodation design

1.1 General

1.1.1 Documents to be submitted
Location and general arrangement of crew accommodation spaces, deck by deck at a scale not less than 1/100, adequately detailing:

- The use of various spaces
- The type of cabins (ratings, officers)
- The surfaces of spaces
- The number of persons (crew/passengers) on board
- The disposition of furniture and fittings and
- The sanitary arrangements.

1.2 General design requirements

1.2.1 The headroom in all seafarer accommodation where full and free movement is necessary is not be less than 203 centimetres, subject to Sec 1, [1.3] if less.

1.2.2 The accommodation shall be adequately insulated, see [1.2.7].

1.2.3 In ships other than passenger ships, sleeping rooms shall be located above the load line amidships or aft, except that, where the size, type or intended service of the ship commands, sleeping rooms may be located in the fore part of the ship, however not forward of the rule vertical extension of the collision bulkhead.

1.2.4 In passenger ships, and in special purpose ships, the Society may, on condition that satisfactory arrangements are made for lighting and ventilation, permit the location of sleeping rooms below the load line, but not immediately beneath working alleyways.

1.2.5 There shall be no direct openings into sleeping rooms from cargo and machinery spaces or from galleys, store-rooms, drying rooms or communal sanitary areas; that part of a bulkhead separating such places from sleeping rooms and external bulkheads shall be constructed of steel or other approved substance and be adequately gas-tight.

1.2.6 The materials used to construct internal bulkheads, panelling and sheeting, floors and joinings shall be adequate for the purpose according to the referred standards.

1.2.7 The details of construction shall be as follows:

a) External bulkheads of sleeping rooms and mess rooms should be adequately insulated. All machinery casings and all boundary bulkheads of galleys and other spaces in which heat is produced should be adequately insulated where there is a possibility of resulting heat effects in adjoining accommodation or passageways. Measures should also be taken to provide protection from heat effects of steam or hot-water service pipes or both. In general insulation materials with thermal conductivity factor K value of 0.036 W/m·K for external boundaries or equivalent are to be used.

b) Sleeping rooms, mess rooms, recreation rooms and alleys in the accommodation space should be adequately insulated to prevent condensation

c) The bulkhead surfaces and deckheads should be of material with a surface easily kept clean. No form of construction likely to harbour vermin should be used.

d) The bulkhead surfaces and deckheads in sleeping rooms and mess rooms should be capable of being easily kept clean and light in colour with a durable, non-toxic finish.

e) The decks in all seafarer accommodation should be of steel or equivalent material and construction and should provide a non-slip surface impervious to damp and easily kept clean.

f) Where the floorings are made of composite materials, the joints with the sides should be profiled to avoid crevices.

1.3 Sleeping accommodation

1.3.1 In ships other than passenger ships, an individual sleeping room shall be provided for each seafarer; in the case of ships of less than 3,000 gross tonnage or special purpose ships, exemptions from this requirement may be considered, subject to Sec 1, [1.3].

1.3.2 Separate sleeping rooms shall be provided for men and for women;

1.3.3 A separate berth for each seafarer shall in all circumstances be provided.

1.3.4 The minimum inside dimensions of a berth shall be at least 198 centimetres by 80 centimetres.

1.3.5 In single berth seafarers' sleeping rooms the floor area shall not be less than:

- 4.5 square metres in ships of less than 3,000 gross tonnage
- 5.5 square metres in ships of 3,000 gross tonnage or over but less than 10,000 gross tonnage
- 7 square metres in ships of 10,000 gross tonnage or over.

1.3.6 However, in order to provide single berth sleeping rooms on ships of less than 3,000 gross tonnage, passenger ships and special purpose ships, a reduced floor area may be considered subject to Sec 1, [1.3].
1.3.7 In ships of less than 3,000 gross tonnage other than passenger ships and special purpose ships, sleeping rooms may be occupied by a maximum of two seafarers; the floor area of such sleeping rooms shall not be less than 7 square metres.

1.3.8 On ships other than passenger ships and special purpose ships, sleeping rooms for seafarers who perform the duties of ships' officers, where no private sitting room or day room is provided, the floor area per person shall not be less than:

- 7.5 square metres in ships of less than 3,000 gross tonnage
- 8.5 square metres in ships of 3,000 gross tonnage or over but less than 10,000 gross tonnage
- 10 square metres in ships of 10,000 gross tonnage or over.

1.3.9 The master, the chief engineer and the chief navigating officer shall have, in addition to their sleeping rooms, an adjoining sitting room, day room or equivalent additional space.

Ships of less than 3,000 gross tonnage may be exempted by the Society from this requirement subject to Sec 1, [1.3].

1.3.10 For each occupant, the furniture shall include a clothes locker of minimum 475 litres and a drawer or equivalent space of not less than 56 litres. If the drawer is incorporated in the clothes locker then the combined minimum volume of the clothes locker shall be 500 litres. It shall be fitted with a shelf and be able to be locked by the occupant.

1.3.11 Each sleeping room shall be provided with a table or desk, which may be of the fixed, drop-leaf or slide-out type, and with adequate seating accommodation.

1.3.12 Details of arrangements shall be as follows:

a) In the case of seafarers performing the duty of petty officers there should be no more than two persons per sleeping room.

b) Space occupied by berths and lockers, chests of drawers and seats should be included in the measurement of the floor area. Small or irregularly shaped spaces which do not add effectively to the space available for free movement and cannot be used for installing furniture should be excluded.

c) Berths should not be arranged in tiers of more than two; in the case of berths placed along the ship's side, there should be only a single tier where a sidelight is situated above a berth.

d) The lower berth in a double tier should be not less than 30 centimetres above the floor; the upper berth should be placed approximately midway between the bottom of the lower berth and the lower side of the deckhead beams.

e) The framework and the lee-board, if any, of a berth should be of approved material (as per standards used in shipbuilding industry), hard, smooth, and not likely to corrode or to harbour vermin.

f) If tubular frames are used for the construction of berths, they should be completely sealed and without perforations which would give access to vermin.

g) Each berth should be fitted with a comfortable mattress with cushioning bottom or a combined cushioning mattress, including a spring bottom or a spring mattress. The mattress and cushioning material used should be made of approved material (as per standards used in shipbuilding industry). Stuffing of material likely to harbour vermin should not be used.

h) When one berth is placed over another, a dust-proof bottom should be fitted beneath the bottom mattress or spring bottom of the upper berth.

i) The furniture should be of smooth, hard material not liable to warp or corrode.

j) Sleeping rooms should be fitted with curtains or equivalent for the sidelights.

k) Sleeping rooms should be fitted with a mirror, small cabinets for toilet requisites, a book rack and a sufficient number of coat hooks.

1.4 Sleeping accommodation - special arrangements on passenger ships or special purpose ships

1.4.1 On passenger ships and special purpose ships the floor area of sleeping rooms for seafarers not performing the duties of ships' officers shall not be less than:

- 7.5 square metres in rooms accommodating two persons
- 11.5 square metres in rooms accommodating three persons
- 14.5 square metres in rooms accommodating four persons.

1.4.2 On special purpose ships sleeping rooms may accommodate more than four persons. The floor area of such sleeping rooms shall not be less than 3.6 square metres per person.

1.4.3 On passenger ships and special purpose ships the floor area for seafarers performing the duties of ships' officers where no private sitting room or day room is provided, the floor area per person for junior officers shall not be less than 7.5 square metres and for senior officers not less than 8.5 square metres. Junior officers are understood to be at the operational level, and senior officers at the management level.

1.5 Mess rooms

1.5.1 Mess rooms shall be located apart from the sleeping rooms and as close as practicable to the galley.

Ships of less than 3,000 gross tonnage may be exempted by the Society from this requirement subject to Sec 1, [1.3].

1.5.2 Mess room facilities are normally separate. They may be common subject to Sec 1, [1.3] and taking account of shipowners' representatives information such as the size of the ship and the distinctive cultural, religious and social needs of the seafarers.
1.5.3 Where separate mess room facilities are to be provided to seafarers, then separate mess rooms should be provided for:

- master and officers; and
- petty officers and other seafarers.

1.5.4 Details of arrangements shall be as follows:

a) On ships other than passenger ships, the floor area of mess rooms for seafarers should be not less than 1.5 square metres per person of the planned seating capacity.

b) In all ships, mess rooms should be equipped with tables and appropriate seats (34 cm minimum breadth), fixed or movable, sufficient to accommodate the specified number of seafarers likely to use them at any one time.

c) There should be available at all times when seafarers are on board:
   - a refrigerator, which should be conveniently situated and of sufficient capacity for the number of persons using the mess room or mess rooms
   - facilities for hot beverages
   - cool water facilities.

d) Where available pantries are not accessible to mess rooms, adequate lockers for mess utensils and proper facilities for washing utensils should be provided.

e) The tops of tables and seats should be of damp-resistant material.

1.6 Sanitary facilities

1.6.1 All seafarers shall have convenient access on the ship to sanitary facilities, with separate sanitary facilities being provided for men and for women;

1.6.2 There shall be sanitary facilities within easy access of the navigating bridge and the machinery space or near the engine room control centre.

Ships of less than 3,000 gross tonnage may be exempted by the Society from this requirement, subject to Sec 1, [1.3].

1.6.3 In all ships a minimum of one toilet, one wash basin and one tub or shower or both for every six persons or less who do not have personal facilities shall be provided at a convenient location.

1.6.4 With the exception of passenger ships, each sleeping room shall be provided with a washbasin having hot and cold running fresh water, except where such a washbasin is situated in the private bathroom provided.

1.6.5 In passenger ships normally engaged on voyages of not more than four hours' duration, consideration may be given to special arrangements or to a reduction in the number of facilities required, subject to Sec 1, [1.3].

1.6.6 Hot and cold running fresh water shall be available in all wash places.

1.6.7 Sanitary accommodation intended for the use of more than one person should comply with the following:

a) Floors should be of approved durable material (as per standards used in shipbuilding industry), impervious to damp, and should be provided with draining arrangements.

b) Bulkheads should be of steel or other approved material (as per standards used in shipbuilding industry) and should be watertight up to at least 23 centimetres above the level of the deck.

c) The accommodation should be sufficiently lit, heated and ventilated.

d) Toilets should be situated convenient to, but separate from, sleeping rooms and wash rooms, without direct access from the sleeping rooms or from a passage between sleeping rooms and toilets to which there is no other access.

   This requirement does not apply where a toilet is located in a compartment between two sleeping rooms having a total of not more than four seafarers; and

e) Where there is more than one toilet in a compartment, they should be screened from 23cm above deck up to deck ceiling minus 10cm minimum.

1.7 Hospital accommodation

1.7.1 Ships carrying 15 or more seafarers and engaged in a voyage of more than three days' duration shall provide separate hospital accommodation to be used exclusively for medical purposes.

This requirement may be exempted for ships engaged in coastal trade subject to Sec 1, [1.3].

The accommodation will, in all weathers, be easy of access, provide comfortable housing for the occupants and appropriate to their receiving prompt and proper attention.

1.7.2 Following provisions must be considered regarding the hospital accommodation design and construction:

a) The hospital accommodation should be designed so as to facilitate consultation and the giving of medical first aid and to help prevent the spread of infectious diseases without requiring separate ventilation.

b) The arrangement of the entrance, berths, lighting, ventilation, heating and water supply should be designed to allow for the comfort and to facilitate the treatment of the occupants.

c) Sanitary accommodation should be provided for the exclusive use of the occupants of the hospital accommodation, either as part of the accommodation or in close proximity thereto. Such sanitary accommodation should comprise a minimum of one toilet, one washbasin and one tub or shower.
1.8 Miscellaneous

1.8.1 Appropriately situated and furnished laundry facilities shall be available.

The laundry facilities provided for seafarers' use should include:

a) washing machines
b) drying machines or adequately heated and ventilated drying rooms
c) irons and ironing boards or their equivalent.

1.8.2 All ships shall have a space or spaces on open deck to which all off duty seafarers can have simultaneous access.

1.8.3 All ships shall be provided with separate offices or a common ship’s office for use by deck and engine departments.

Ships of less than 3,000 gross tonnage may be exempted from this requirement subject to Sec 1, [1.3).

1.8.4 Ships regularly trading to mosquito-infested ports shall be fitted with appropriate devices unless directly provided by air conditioning systems.

1.8.5 Appropriate seafarers' recreational facilities, amenities and services, as adapted, shall be provided on board according to the shipowner’s specifications showing evidence that they take account of the needs expressed by seafarers.

2 Vibration prevention

2.1 General

2.1.1 Documents to be presented

Documents to be presented are detailed in Tab 1.

<table>
<thead>
<tr>
<th>N°</th>
<th>Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General arrangements</td>
</tr>
<tr>
<td>2</td>
<td>List of measuring points:</td>
</tr>
<tr>
<td></td>
<td>• vibration level at sea conditions</td>
</tr>
<tr>
<td>3</td>
<td>Measurement program:</td>
</tr>
<tr>
<td></td>
<td>• loading conditions</td>
</tr>
<tr>
<td></td>
<td>• propulsion operating conditions</td>
</tr>
<tr>
<td></td>
<td>• other equipment in operation</td>
</tr>
<tr>
<td></td>
<td>• weather conditions</td>
</tr>
<tr>
<td></td>
<td>• measuring instrument calibration sheets</td>
</tr>
</tbody>
</table>

2.1.2 Standards of relevance

- ISO 2041, "Vibration and shock - Vocabulary".
- ISO 6954:2000, "Mechanical vibration - Guidelines for measurements, reporting and evaluation of vibration with regard to habitability on passenger and merchant ships".
- ISO 2631, "Mechanical vibration and shock- Evaluation of human exposure to whole-body vibration".
- ISO 8041, "Human response to vibration - Measuring instrumentation".

2.2 Design requirements

2.2.1 General - scope

Seafarers should not to be exposed to excessive vibration level.

2.2.2 Criteria

The vibration criterion is based on the guideline levels given by ISO 6954:2000. It shall be expressed in terms of overall frequency-weighted r.m.s. velocity (mm/s) from 1 to 80Hz as defined by the standard. The highest value in any direction shall be used for the evaluation, using the guidance given in Tab 2.

2.2.3 Vibration levels

Vibration levels are detailed in Tab 2.

<table>
<thead>
<tr>
<th>Location</th>
<th>Frequency range</th>
<th>Maximum vibration velocity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodation and recreation spaces</td>
<td>1 to 80 Hz</td>
<td>6 mm/s</td>
</tr>
<tr>
<td>Catering facilities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.3 Testing

2.3.1 General

Measurements are to be performed under attendance of a Society’s surveyor during building stage, sea trials or in service, as relevant.

2.3.2 Instrumentation

Measurement and calibration equipments are to comply with ISO 6954 and ISO 8041. The instrumentation has to include at least a transducer (accelerometer or velocity transducer) with an appropriate amplifier, and a FFT (Fast Fourier Transform) analyser. The instrumentation has to be calibrated in situ, before and after the tests. Should the vibration measurements be performed on a soft floor, a tripod mount is to be used.
2.3.3 Measuring positions

The list of measuring points is to be prepared prior to the tests (see [2.1.1]). This list is to be presented to the Society and may be adjusted during the tests. Measurements may be performed in locations such as corridors, sanitary spaces, when vibration levels are expected to be high.

Measurements are to be taken in vertical direction. In cabins, offices or other small size rooms, measurements are to be taken on the floor in the centre of the room. For larger rooms, several measuring points may be required and are to be chosen taking account the local structure (measurements of the different existing types of stiffened panels). Vibrations are to be measured in throughout accommodation space (typical cabins, mess rooms, typical offices).

In addition to vertical direction, measurements in transverse and longitudinal directions are to be performed on one point of each deck.

2.3.4 Test conditions

a) Vibration level measurement is to be carried out according to the requirements of ISO 6954:2000.

b) Sea trials conditions:

1) During sea trials, propeller output has to correspond to the operating condition specifications of the ship. In particular, ships which are frequently operated by means of a Dynamic Positioning system (DP system) may require additional measurements to be performed in DP mode according to a specification taking account of duration of transients.

2) Any other frequently used equipment (more than 1/3 of the time at sea) is to be run at its normal operating conditions (if practicable). The list of machine and equipment to be run during the tests is normally to include the following:
   - generating sets
   - air conditioning and machinery ventilation
   - evaporators
   - anti rolling devices
   - compressors, chillers
   - cold rooms
   - waste treatment units
   - swimming pool with pumps
   - jacuzzi and thalassotherapy equipment
   - laundry with the entire equipment running: drying (spin dryer or tumble dryer) and washing machines (for measurements inside laundry, equipment is to be stopped).

3) Standard test conditions correspond to the loading condition defined for sea trials. Nevertheless, for cargo ships which are operated over a wide range of draughts, the readings may significantly differ from test condition to another loading condition. The Society will determine whether it requires measurements for another one loading condition than the sea trials condition.

4) The meteorological conditions such as wind (max Beaufort 4), rain (moderate) as well as sea state (max 1m significant wave height), should normally be accepted as not influencing the measurements.

5) The tests have to be performed in deep water, with a water depth greater than 5 times the mean draft. However, for ships usually operating in coastal waters, measurements may be taken with conditions declared to correspond to normal service conditions.

6) Ship course has to be kept constant, with rudder angle less than 2 degrees portside or starboard, for the duration of the measurement. If ship manoeuvring is needed, measurements must be stopped until recovery of heading.

2.3.5 Test report framework

The measurement report shall be submitted to the Society for review. The details listed in the following paragraphs shall be provided in the Vibration test report.

a) General information:
   - Testing company/ names of the involved personnel
   - Name of the Surveyors
   - Name of the ship
   - IMO number of the ship
   - Name of the owner
   - Name of the shipyard
   - Classification society name and register number
   - Date of the test
   - All deviation from the approved test plan shall be reported.

b) Ship’s main data:
   - Hull: tonnage / Length (BP) / Breadth moulded / Maximum draught
   - Machinery: Main engine data / Auxiliary engine data/ Gear data / Propulsion data / Service speed / Est. propulsion power.

c) Test main conditions:
   - Test site location
   - Environmental conditions: Sea height / wind state
   - Speed of the ship
   - Alt/Fore Draught
   - Test Machinery conditions
   - Machinery ventilation condition
   - HVAC condition.

d) Measuring equipment data:
   - ID / manufacturer / serial number
   - Last calibration dates - Calibration certificates.

e) Results:
   - Measurement positions (additionally indicated on appropriate drawings)
   - Location and orientation of transducers
   - Measurement duration
   - Results of the measurements
   - All deviation from the vibration level requirements of Tab 2
3 Noise prevention

3.1 General

3.1.1 Documents to be presented
Documents to be presented are detailed in Tab 3.

Table 3: Documents to be presented for noise prevention

<table>
<thead>
<tr>
<th>No.</th>
<th>Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General arrangements</td>
</tr>
<tr>
<td>2</td>
<td>List of measuring points:</td>
</tr>
<tr>
<td></td>
<td>• noise level at sea conditions</td>
</tr>
<tr>
<td></td>
<td>• insulation measurements</td>
</tr>
<tr>
<td></td>
<td>• impact measurements</td>
</tr>
<tr>
<td>3</td>
<td>Measurement program:</td>
</tr>
<tr>
<td></td>
<td>• loading conditions</td>
</tr>
<tr>
<td></td>
<td>• propulsion operating conditions</td>
</tr>
<tr>
<td></td>
<td>• other equipment in operation</td>
</tr>
<tr>
<td></td>
<td>• weather conditions</td>
</tr>
<tr>
<td></td>
<td>• measuring instrument calibration sheets</td>
</tr>
</tbody>
</table>

3.1.2 Regulations, standards of relevance
- IMO Resolution A.468 (XII), "Code on noise levels onboard ships"
- ISO 2923, "Acoustics - Measurements of noise on board vessels"
- ISO 31/VII, "Quantities and units of acoustics"
- IEC Publication 61672, "Electroacoustics-Sound level meters"
- IEC Publication 61260, "Octave, half-octave and third octave band filters"
- IEC Publication 60942, "Electroacoustics - Sound calibrators"
- ISO 140, "Acoustics - Measurements of sound insulation in buildings and of building elements", namely:
  - Part 4, "Field measurements of airborne sound insulation between rooms"
  - Part 13, "Guidelines"
  - Part 14, "Guidelines for special situation in the field"
- ISO 717, "Acoustics - Rating of sound insulation in buildings and of building elements", namely:
  - Part 1, "Airborne sound insulation in buildings and interior elements"
- IEC Publication 60268-16, "Sound system equipment - Part 16: Objective rating of speech intelligibility by speech transmission index".

3.2 Design requirements

3.2.1 General - scope
Seafarers shall not be exposed to excessive noise level.

3.2.2 Criteria
The noise levels provided in this section are based on the IMO Resolution A.468(XII) (1981) : Code on noise levels on board ships.

Consideration should be given to the acoustic insulation between accommodation spaces in order to make rest and recreation possible even if activities are taking place in adjacent spaces, e.g. music, talking, cargo-handling, etc.

3.2.3 Maximum noise levels
Maximum noise levels are detailed in Tab 4.

Table 4: Maximum equivalent continuous A-weighted noise level $L_{Aeq}$

<table>
<thead>
<tr>
<th>Location</th>
<th>Noise Limit $L_{Aeq}$ in dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodation and recreation Spaces</td>
<td></td>
</tr>
<tr>
<td>Cabins and Hospital</td>
<td>60</td>
</tr>
<tr>
<td>Mess rooms</td>
<td>65</td>
</tr>
<tr>
<td>Recreation rooms</td>
<td>65</td>
</tr>
<tr>
<td>Open recreation spaces</td>
<td>75</td>
</tr>
<tr>
<td>Offices</td>
<td>65</td>
</tr>
<tr>
<td>Catering facilities</td>
<td></td>
</tr>
<tr>
<td>Galley without food processing</td>
<td></td>
</tr>
<tr>
<td>Equipment operating</td>
<td>75</td>
</tr>
<tr>
<td>Serveries and pantries</td>
<td></td>
</tr>
</tbody>
</table>

3.2.4 Sound insulation index
Building specifications should normally include provisions applicable to the erection of materials and in the construction of accommodation spaces to reduce sound transmission. Measurements should be performed onboard ships for a representative selection of the different types of partitions, floors and doors.

The apparent weighted sound reduction index ($R'w$ as defined in ISO 717 Part 1) should attain the following indexes:
- Cabin to cabin: $R'w = 30$
- Mess rooms, recreation rooms to cabins and hospitals: $R'w = 45$
- Corridor to cabin: $R'w = 30$

3.3 Testing

3.3.1 General
Measurements are to be performed under attendance of a Society’s surveyor during building stage, sea trials or in service, as relevant.

3.3.2 Instrumentation
Measurement and calibration equipments are to comply with ISO 2923, IEC 61672, IEC 61260 and IEC 60942. The instrumentation has to be calibrated in situ, before and after the tests.
3.3.3 Measuring positions

a) The list of measuring points is to be prepared prior to the tests (see [3.1.1]). This list is to be presented to the Society and may be adjusted during the tests. Measurements may be performed in locations such as corridors, sanitary spaces, where noise levels are expected to be high.

b) Noise measurements:

One measurement should be made in the middle of the space. The microphone should be moved slowly horizontally and/or vertically over a distance of 1 m. Additional measurements may be performed in other locations if appreciable sound level differences inside the room occur.

On open decks, measurements should be taken in areas provided for the purpose of recreation. The measurements are to be taken at 2 m at least from the existing noise sources (e.g. inlet/outlet of ventilation).

c) Sound insulation measurements:

The selection of insulation measuring locations is to be representative of the different types of insulation provided in [3.2.4] (one measurement of each type is normally to be performed).

3.3.4 Test conditions

a) Noise level measurement is to be carried out according to the requirements of ISO 2923. Sound insulation measurement is to be carried out according to ISO 140-4, ISO 140-13 and ISO 140-14.

b) Harbour test conditions:

Noise measurement tests for the determination of insulation indexes between rooms is to be conducted at quay or at anchorage in a condition as near as possible to dead ship condition. For these tests, no particular condition concerning output, loading, water depth or weather conditions are required.

c) Sea trials conditions:

1) During sea trials, propeller output has to correspond to the operating condition specifications of the ship. In particular, ships which are frequently operated by means of a Dynamic Positioning system (DP system) may require additional measurements to be performed in DP mode according to a specification taking account of duration of transients.

2) Any other frequently used equipment (more than 1/3 of the time at sea) is to be run at its normal operating conditions (if practicable). The list of machine and equipment to be run during the tests is, at least, to include (if present) the following:

- generating sets
- air conditioning and machinery ventilation
- evaporators
- anti rolling devices
- compressors, chillers
- cold rooms
- waste treatment units
- swimming pool with pumps
- jacuzzi and thalassotherapy equipment
- laundry with the entire equipment running: drying (spin dryer or tumble dryer) and washing machines (for measurements inside laundry, equipment is to be stopped).

3) Standard test conditions correspond to the loading condition defined for sea trials. Nevertheless, for cargo ships which are operated over a wide range of drafts, the readings may significantly differ from test condition to another loading condition. The Society will determine whether it requires measurements for another one loading condition than the sea trials condition.

4) The meteorological conditions such as wind (max Beaufort 4), rain (moderate) as well as sea state (max 1m significant wave height), should normally be accepted as not influencing the measurements.

5) The tests have to be performed in deep water, with a water depth greater than 5 times the mean draft. However, for ships usually operating in coastal waters, measurements may be taken with conditions declared to correspond to normal service conditions.

6) Ship course has to be kept constant, with rudder angle less than 2 degrees portside or starboard, for the duration of the measurement. If ship manoeuvring is needed, measurements must be stopped until recovery of heading.

3.3.5 Test report framework

The measurement report shall be submitted to the Society for review. The details listed in the following paragraphs shall be provided in the Noise test report.

a) General information:

- Testing company/ names of the involved personnel
- Name of the Surveyors
- Name of the ship
- IMO Number of the ship
- Name of the owner
- Name of the shipyard
- Classification society name and register number
- Date of the test
- All deviation from the approved test plan shall be reported.

b) Ship’s main data:

- Hull: tonnage / Length (BP) / Breadth moulded / Maximum draught
- Machinery: Main engine data / Auxiliary engine data/ Gear data / Propulsion data / Service speed / Est. propulsion power.

c) Test main conditions:

- Test site location
- Environmental conditions: Sea height / wind state
- Speed of the ship
- Alt/Fore Draught
- Test Machinery conditions
- Machinery ventilation condition
- HVAC condition.
4 Ventilation, heating and air conditioning

4.1 General

4.1.1 Documents to be submitted
The following documentation relating to the Design Philosophy of the HVAC system shall be presented to the Society for review and information, as follows:

a) General arrangement of air distribution and location of all relevant interacting components such as cooling and heating coils, means for temperature and relative humidity regulation, dampers, data analysis including methods, software and instrumentation.

b) Actual measurement locations and transducer positions shall be indicated on appropriate drawings.

4.1.2 Regulations, standards of relevance
- ASHRAE (American Society of Heating Refrigerating and Air Conditioning Engineers)
- ISO 7726 (E) (1998)
- NEBB (1998)

4.2 Design requirements

4.2.1 Central HVAC (Heating, Ventilation and Air-Conditioning) performance requirements

a) The HVAC system including the condensing unit capacity and the interacting components shall be provided with efficient means to condition the air in compliance with the requirements of the Convention (Reg 3.1) and ISO 7730:1994(E).

b) Air-conditioning systems, whether of a centralized or individual unit type, should be designed to maintain the air at a satisfactory temperature and relative humidity and ensure a sufficiency of air changes in all air conditioned spaces as per Tab 5, taking into account the specified ambient conditions at sea.

c) Indoor climate criteria for the notation ACCOMMODATION apply only to manned spaces.

d) A ‘manned’ space is considered herein as a space occupied by a seafarer at least for twenty (20) minutes or longer at a time.

4.2.2 Monitoring and control

a) The HVAC system shall be capable of providing return air temperatures as those indicated in Tab 5.

b) The temperature and relative humidity shall be sufficiently maintained and controlled in each concerned space, whereas the overall system shall be capable of providing and maintaining the room temperature and relative humidity as indicated in Tab 5.

Table 5: Air temperature, relative humidity and air exchange requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Air Temperature</td>
<td>22 to 25°C</td>
</tr>
<tr>
<td>2</td>
<td>Relative Humidity</td>
<td>30% minimum to 70% maximum</td>
</tr>
<tr>
<td>3</td>
<td>Air Exchange Rate</td>
<td>six (6) complete changes-per-hour</td>
</tr>
</tbody>
</table>

4.3 Testing

4.3.1 Test plan

a) Along with the design details of the HVAC system, a Test Plan shall be presented to the Society for review.

b) Test Plan shall include the necessary documentation and data to enable the Surveyor to verify the compliance with the indoor climate criteria set in this Guidance Note and to identify the spaces where measurements are to be taken:

1) HVAC system design specifications
2) Schematics/layout drawings of the HVAC system
3) General arrangement drawings of the vessel’s accommodations indicating the concerned spaces.

c) The personnel running the test are to be qualified for performing Ambient Environmental Testing, and the relevant qualifications documentation is to be included in the test report.

d) Details of measuring and analysis equipment (e.g., manufacturer, type and serial number, accuracy, sampling frequency, and resolution) shall be provided.

Documentation establishing compliance with minimum requirements for instruments entails for such purpose in accordance with international recognized standards is to be included.

e) The equipment calibration and data collection process of the indoor climate tests shall be done under attendance of a Society’s Surveyor.

f) Copies of the relevant instrumentation reference calibration certificates, together with the results of field setup and calibration checks before and after the field tests, shall be provided.

g) The performance test of the entire system shall be conducted in accordance with recognized practice and standards from an organization that establishes and maintains HVAC system industry standards, procedures and specifications.

h) A table format shall be submitted with all the relevant information on the concerned spaces being subjected to physical measurements as indicated in Tab 6 including any deviations from the approved Test Plan.
i) Specific locations are to be identified as "Measurement Locations" and the test conditions are to be based on an international recognized standard.

j) A preset return air temperature shall be maintained by a temperature controller for each concerned zone when HVAC systems do not make provision for individual adjustment within a specific space.

### Table 6: Physical measurements

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Measurement position</td>
</tr>
<tr>
<td>2</td>
<td>Number of people present in the space at time of measurement</td>
</tr>
<tr>
<td>3</td>
<td>Measurement period</td>
</tr>
<tr>
<td>4</td>
<td>Time at start and end of measurement</td>
</tr>
<tr>
<td>5</td>
<td>Air temperature (1) (2)</td>
</tr>
<tr>
<td>6</td>
<td>Relative humidity (3)</td>
</tr>
<tr>
<td>7</td>
<td>Outdoor wind speed and direction</td>
</tr>
<tr>
<td>8</td>
<td>Ambient outdoor air temperature</td>
</tr>
<tr>
<td>9</td>
<td>Outdoor humidity</td>
</tr>
<tr>
<td>10</td>
<td>Barometric pressure corresponding to indoor measurement periods</td>
</tr>
</tbody>
</table>

(1) Minimum, maximum, and average
(2) As per [4.3.2], item k)
(3) As per [4.3.2], item l)

### 4.3.2 Test report

a) A Test Report shall be presented to the Society after completion of the test.

b) The report on the test results for air temperature and relative humidity shall include the items listed in Tab 8, and shall document the spaces or areas where measurements were taken.

c) The Test Report shall detail the environmental conditions under which the tests were performed and shall be accomplished at sea, with the equipment functioning in the design operational mode. See Tab 7.

d) All doors and windows are to be kept closed (except those to be left open), and are to be furnished according to the space accommodation intended design; whereas for cooling mode, the test should be performed on a clear day.

e) The data shall be gathered every five (5) minutes for air temperature and relative humidity and three (3) minutes for air velocity during a period of two (2) hours. Entry and exit to and from the space being tested should be kept to a minimum and shall be mentioned in the report.

f) Whether for cooling or heating tests, and as far as practicable, within those zones having high sensitivity to time of day, the measurements in one same space should be performed in the system most demanding conditions possible during the day or night as applicable.

g) When selecting indoor climate measurement locations, accurate representative sample of data shall be used reproducing best the actual conditions in manned spaces. Attention shall be paid to areas to be identified as specific vs. conditions of radiation or absorption of heat that substantially affect the indoor climate.

h) The same criteria applies for gathering data in spaces covering large portions of the vessel, and when the area extends from one side to the other, the selection of areas shall normally include port starboard and amidships, as well as fore and aft sections of the space.

i) Measurements shall be done for each space commonly manned, such as bridge, radio room, officer's mess, gymnasium, library etc.; whereas for cabins, a representative sample, including the worst case locations, of at least 20% percent of each type of cabin shall be selected for measurement.

j) Air temperature and relative humidity measuring instrumentation shall be set up approximately in the middle of the space to measure general space temperature and humidity levels.

k) Air temperature shall be simultaneously measured at approximately 100 mm, 1100 mm and 1700 mm above the deck.

l) Relative humidity shall be measured at a height of approximately 1700 mm above the deck.

### Table 7: Test conditions

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Climate</td>
</tr>
<tr>
<td>2</td>
<td>Loading condition</td>
</tr>
<tr>
<td>3</td>
<td>Number of seafarers and total number of persons onboard during testing</td>
</tr>
<tr>
<td>4</td>
<td>Machinery operating conditions</td>
</tr>
<tr>
<td>5</td>
<td>Navigation conditions:</td>
</tr>
<tr>
<td></td>
<td>a) Vessel course and speed versus wind speed and direction</td>
</tr>
<tr>
<td></td>
<td>b) Ambient outdoor air temperature outdoor humidity</td>
</tr>
<tr>
<td></td>
<td>c) Barometric pressure</td>
</tr>
<tr>
<td></td>
<td>d) Latitude and longitude</td>
</tr>
<tr>
<td>6</td>
<td>Weather conditions and meteorological data</td>
</tr>
<tr>
<td>7</td>
<td>Sea state</td>
</tr>
<tr>
<td>8</td>
<td>Special activities (1)</td>
</tr>
</tbody>
</table>

(1) Conditions during the test that might affect results

### Table 8: Test results

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Transducer measurement positions</td>
</tr>
<tr>
<td>2</td>
<td>Measurement Locations (1)</td>
</tr>
<tr>
<td>3</td>
<td>Reaction time to load variation</td>
</tr>
<tr>
<td>4</td>
<td>Data Analysis (2)</td>
</tr>
<tr>
<td>5</td>
<td>Data Acquisition and Instruments (3)</td>
</tr>
</tbody>
</table>

(1) Indoor climate measurements shall be in accordance with the requirements of an international recognized standard
(2) Methods, software, and instrumentation to be used for data analysis
(3) The instrumentation shall meet the characteristics of instruments for measuring physical quantities characterizing an environment specified in ISO 7726:1998(E)
4.3.3 Walkthrough verification inspection and spot check measurements

a) A walkthrough verification inspection covering at least 10% of all other manned spaces not included in the test is to be done to assess the indoor climatic qualities of those spaces, and the potential impact on the areas subject to physical measurements in accordance with Tab 9.

b) One copy of the report shall be presented to the Society for filing and one copy shall be included in the final Indoor Climate Test Report.

Table 9: Ventilation, heating and air conditioning - Other manned spaces

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name and number of space</td>
</tr>
<tr>
<td>2</td>
<td>Walkthrough verification inspection results</td>
</tr>
<tr>
<td>3</td>
<td>Spot measurement results (1)</td>
</tr>
<tr>
<td>(1)</td>
<td>When appropriate</td>
</tr>
</tbody>
</table>

5 Lighting

5.1 General

5.1.1 Documents to be submitted

Documents to be submitted are detailed in Tab 10.

Table 10: Documents to be submitted for lighting

<table>
<thead>
<tr>
<th>N°</th>
<th>Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Single line diagram of main lighting system</td>
</tr>
<tr>
<td>2</td>
<td>Single line diagram of emergency lighting system</td>
</tr>
<tr>
<td>3</td>
<td>Layout diagram of main lighting system</td>
</tr>
<tr>
<td>4</td>
<td>Layout diagram of emergency lighting system</td>
</tr>
<tr>
<td>5</td>
<td>Average illumination levels calculations per room (EN13032-1)</td>
</tr>
</tbody>
</table>

5.1.2 Regulations, standards of relevance

- IEC 61892-2
- IEC 60598 and 60092-306.

5.1.3 Illumination level

Illumination level is the luminous flux per unit area at any point on a surface exposed to incident light, measured in luxes.

5.2 Design requirements

5.2.1 General

General lighting illumination on accommodation areas are to be at least as per Tab 11, unless specific illumination levels requirements of concerned authority. The average illumination levels mentioned below are stated as maintained average illuminance, which is understood as the average illumination level at the time where maintenance is to be carried out.

Different light colours will be used when required.

5.2.2 Emergency lighting

The emergency lighting level shall, as a minimum be 30% of the general lighting level requirement.

5.2.3 Escape lighting

The escape lighting system shall, as a minimum, provide a lighting level to meet the illumination levels given in Tab 12.

5.3 Testing

5.3.1 On board testing of lighting systems is to be done in presence of a Society’s surveyor. Illumination levels are to be measured according to IEC 61892-2. Deviations of measured values from Tab 11 and Tab 12 are to be documented in the report presented to the Society.

Table 11: General lighting illumination levels

<table>
<thead>
<tr>
<th>Area</th>
<th>Normal Lighting (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Illuminance E (lux)</td>
</tr>
<tr>
<td>General outdoor areas</td>
<td>50</td>
</tr>
<tr>
<td>General indoor areas, corridors,</td>
<td>100</td>
</tr>
<tr>
<td>accommodation, etc.</td>
<td></td>
</tr>
<tr>
<td>Stairways</td>
<td>150</td>
</tr>
<tr>
<td>Offices</td>
<td>500</td>
</tr>
<tr>
<td>Laundry and mess area</td>
<td>300</td>
</tr>
<tr>
<td>Hospital</td>
<td>300</td>
</tr>
<tr>
<td>WC and sanitary room</td>
<td>100</td>
</tr>
<tr>
<td>Sanitary room mirror</td>
<td>200</td>
</tr>
<tr>
<td>Cabin general illumination</td>
<td>100</td>
</tr>
<tr>
<td>Cabin reading desk</td>
<td>300</td>
</tr>
<tr>
<td>Cabin head bed light</td>
<td>120</td>
</tr>
</tbody>
</table>

(1) Verification of the lighting levels shall be made by measurements one meter above floor level in general areas and at actual work places where appropriate levels are required.

Note 1: The number of measured points on each area is to be in accordance with IEC 61892-2.
Table 12: Escape lighting illumination levels

<table>
<thead>
<tr>
<th>Area</th>
<th>Normal Lighting (1)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Illuminance E (lux)</td>
<td>Minimum Illuminance E (lux)</td>
</tr>
<tr>
<td>General outdoor escape routes</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>General Indoor escape routes, corridors, accommodation, etc.</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Stairways escape routes</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Offices</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Laundry and mess area</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Hospital</td>
<td>300</td>
<td>120</td>
</tr>
<tr>
<td>Hospital spotlight</td>
<td>1000</td>
<td>500</td>
</tr>
</tbody>
</table>

(1) Verification of the lighting levels shall be made by measurements one meter above floor level in general areas and at actual work places where appropriate levels are required.

Note 1: The number of measured points on each area is to be in accordance with IEC 61892-2.