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# RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

## Part V LOAD LINES

### Chapter 1 GENERAL

#### 1.1 General

##### 1.1.1 Application

The requirements in this Part apply to all ships intended for international voyages except undermentioned ships.

- (1) Ships,  $L_f$  of which is less than 24 metres
- (2) Pleasure yachts not engaged in trade
- (3) Fishing vessels

##### 1.1.2 Special Cases in Application

In ships to which the requirements in this Part are not directly applicable for some special reasons i.e. unusual form or proportion, or carriage of special cargoes load lines are to be determined at the Society's discretion notwithstanding the provisions in [1.1.1](#).

##### 1.1.3 National Requirements

The Society may make special requirements as instructed by the flag-government of ships or the government of sovereign nation in which ships navigate.

**Chapter 2      ASSIGNMENT OF FREEBOARD AND MARKING OF LOAD LINES****2.1      General****2.1.1      General\***

1    Ships are to be marked with the load lines corresponding to freeboard assigned in accordance with the requirements in this Part.

2    In ships carrying timber cargoes on exposed deck, timber load lines may be marked in accordance with the requirements in this Part in addition to the load lines specified in above -1.

3    The Society may accept freeboards assigned by the flag-government of ships or its recognizing organization according to “*International Convention on Load Lines, 1966 and Protocol of 1988 relating to the International Convention on Load Lines, 1966*” (hereinafter referred to as “*ILLC*”) or National Local Rules based on *ILLC* and marking load lines corresponding to them.

**2.2      Assignment of Freeboard and Marking of Load Lines****2.2.1      Assignment of Freeboard\***

Freeboard is to be assigned in accordance with *ILLC* after confirming that the hull structure has a sufficient strength for the draught corresponding to the freeboard assigned.

**2.2.2      Marking of Load Lines\***

Load lines corresponding to assigned freeboards are to be marked with in accordance with *ILLC*.

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# GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

## Part V LOAD LINES

### V2 ASSIGNMENT OF FREEBOARD AND MARKING OF LOAD LINES

#### V2.1 General

##### V2.1.1 General

1 The Society accepts the freeboards assigned by the flag Administration of ships or its recognizing organization subject to the hull structure of ships being confirmed to have a sufficient strength for the draught corresponding to them.

2 When a freeboard is assigned to a ship under the instruction by the flag Administration according to the *International Convention of Load Lines, 1966* and the *Protocol of 1988 relating to the International Convention of Load Lines, 1966*, the following IACS Unified Interpretations are to apply.

LL2, LL15, LL16, LL17, LL18, LL24, LL25, LL26, LL27, LL28, LL29, LL30, LL31, LL33, LL34, LL35, LL37, LL38, LL39, LL41, LL42, LL43, LL48, LL53, LL54, LL56, LL57, LL59, LL63, LL65, LL69, LL72, LL81

#### V2.2 Assignment of Freeboard and Marking of Load Lines

##### V2.2.1 Assignment of Freeboard

1 In the case of the freeboard assignment specified in **2.2.1, Part V of the Rules**, the standard heights of superstructures and raised quarterdecks used for freeboard assignment calculations are given in **Table V2.2.1-1**. For intermediate values not specified in the table,  $L_f$  is to be obtained by linear interpolation.

2 The ordinates of the standard sheer profile are given in **Table V2.2.1-2**. The standard mean height of sheer is the sums of the respective products, which are obtained from each four ordinate of the profile in forward and after half multiplied by the corresponding coefficients given in **Table V2.2.1-2**, divided by eight.

3 For the application of regulation 28 of the *International Convention of Load Lines, 1966 and Protocol of 1988 relating to the International Convention of Load Lines, 1966* (hereinafter, referred to as *ILLC*), the tabular freeboards for ships with lengths between 365 m and 400 m are to be determined by the following formula.

(1) Freeboards for Type A ships

(a)  $221 + 16.10L_f - 0.02L_f^2$  (mm) for ships of  $365 < L_f \leq 400$  (m)

(b) 3,460 (mm) for ships of  $400 < L_f$  (m)

(2) Freeboards for Type B ships

(a)  $-587 + 23L_f - 0.0188L_f^2$  (mm) for ships of  $365 < L_f \leq 400$  (m)

(b) 5,605 (mm) for ships of  $400 < L_f$  (m)

4 When there are steps or recesses in a transverse bulkhead, assumed damages specified in regulation 27(12) of *ILLC* are to be determined as per **Fig. V2.2.1-1(1)** to **(4)**.

5 Where gutter bars are installed on the weather decks of tankers in way of cargo manifolds and are extended aft as far as the after house front, the free surface effects of boarding seas is to be taken into account with respect to the ship's residual stability specified in regulation 27(13) of *ILLC*.

6 Small access openings stipulated in regulation 27(14)(c) of *ILLC* generally refer to access openings that have an area not greater than  $1.5 \text{ m}^2$ . Access openings with plates which are secured by closely spaced bolts and in their joining parts are properly gasketed, need not be considered as openings.

7 For bulk carriers assigned *B-60* or *B-100* freeboards according to regulation 27 of *ILLC* and intended to carry deck cargoes, the *KG* used for demonstrating compliance with the deterministic damage stability requirements of that regulation is to be the same as that used for the probabilistic damage stability calculations specified in 2.3, Part 1, Part C of the Rules, at the deepest subdivision load line. For ships assigned timber freeboards according to the provisions of Part V of the Rules, the above mentioned deepest subdivision load line is to be read as the deepest timber subdivision load lines.

8 Where a recess in the freeboard deck extends to both sides of the ship but is not in excess of 1 *m* in length, it is to be treated as a recess that does not extend to the sides of the ship for the application of regulation 32-1 of *ILLC*.

9 In the application of regulation 34(1) of *ILLC*, where a cargo hatchway complying with the following conditions, extends above the level of the superstructure deck and covers the whole area of the recess, the hatchway may be deemed as forming a part of the superstructure, allowing the effective length of the superstructure not to be reduced by the area of the recess.

- (1) The hatchway is complying with the requirements of regulation 16 of *ILLC*.
- (2) The coaming height extending above the level of the superstructure deck is not less than the following values.
  - (a) Position 1: 600 *mm*
  - (b) Position 2: 450 *mm*

10 In the application of the regulations of *ILLC*, where moonpools are arranged within the hull in open communication with the sea, the volume of the moonpool is not to be included in the calculation of any hydrostatic properties. An addition is to be made to the geometric freeboard, if the moonpool has a cross-sectional area that is larger above the waterline at 0.85 of freeboard depth than below, corresponding to the lost buoyancy. This addition for the excess portion above 0.85 of freeboard depth is to be made as prescribed for recesses in regulation 32-1. If an enclosed superstructure contains part of the moonpool, a deduction should be made from the effective length of the superstructure.

11 In the application of the regulation 27(3) and (8) of the *ILLC*, the permeability assumed in the damage stability calculation for the flooding of any store space is to be 0.95.

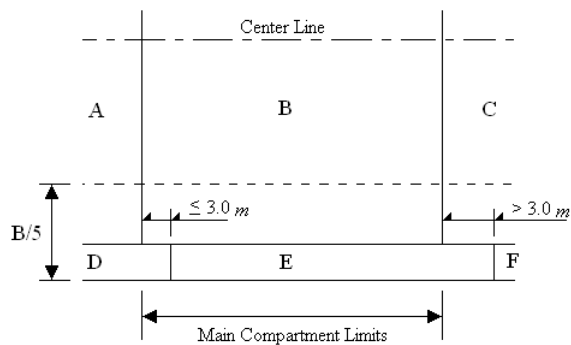
Table V2.2.1-1 Standard Heights of Superstructures

Freeboard length $L_f$ (m)	Standard height $h_s$ (m)	
	Raised quarter decks	All other superstructures
30 <i>m</i> or less	0.90	1.80
75 <i>m</i>	1.20	1.80
125 <i>m</i> or more	1.80	2.30

Table V2.2.1-2 Standard Sheer Profile

	Station	ordinates (mm)	coefficient
After half	After Perpendicular	$25(L_f/3+10)$	1
	$L_f/6$ from <i>A.P.</i>	$11.1(L_f/3+10)$	3
	$L_f/3$ from <i>A.P.</i>	$2.8(L_f/3+10)$	3
	Amidships	0	1
Forward half	Amidships	0	1
	$L_f/3$ from <i>F.P.</i>	$5.6(L_f/3+10)$	3
	$L_f/6$ from <i>F.P.</i>	$22.2(L_f/3+10)$	3
	Forward Perpendicular	$50(L_f/3+10)$	1

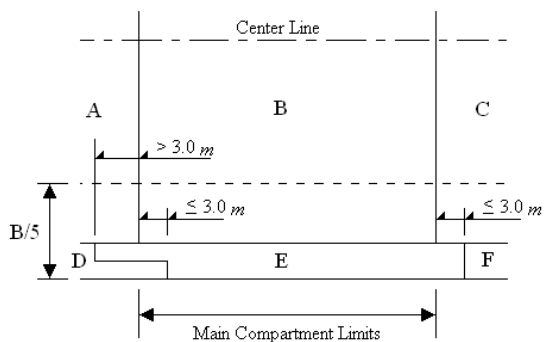
Fig. V2.2.1-1.(1)



Compartments to be considered damaged simultaneously:

- A + D
- B + E
- C + E + F

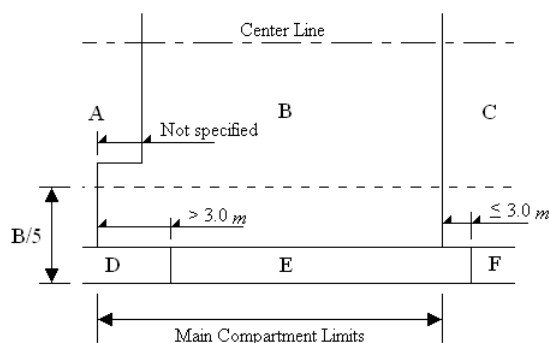
Fig. V2.2.1-1.(2)



Compartments to be considered damaged simultaneously:

- A + D + E
- B + E
- C + F

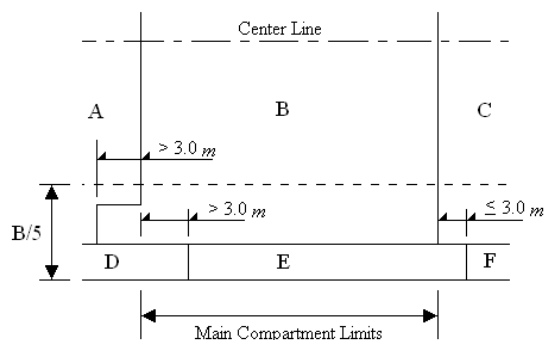
Fig. V2.2.1-1.(3)



Compartments to be considered damaged simultaneously:

- A + D
- B + D + E
- C + F

Fig. V2.2.1-1.(4)



Compartments to be considered damaged simultaneously:

A + B + D

B + D + E

C + F

12 In the application of regulation 36(6) of the *ILLC*, the following requirements (1) and (2) are to be complied with:

- (1) The following arrangements (a) and (b) may be regarded as “continuous hatchways”:
  - (a) In the case of a single hatchway, the hatchway may be regarded as a “continuous hatchway”.
  - (b) In cases where more than one hatchway is fitted, detached hatchways which are connected by longitudinal coamings and linked by weathertight decked steel structures in between may be regarded as “continuous hatchways” (See Fig.V2.2.1-2(1)). In such cases, the entire enclosed volume of the single hatchways and the weathertight spaces between them may be regarded as the “continuous hatchway”.
- (2) In cases where more than one hatchway is fitted, excluding the preceding (1)(b), each hatchway (including detached hatchways connected by longitudinal coamings) is considered to be a “separated detached trunk” and such hatchways are not to be regarded as “continuous hatchways” (See Fig.V2.2.1-2(2) and Fig.V2.2.1-2(3)). In such cases, each hatchway may be treated separately as a trunk in freeboard computations provided that the hatchway complies with regulation 36 of the *ILLC*.

Fig. V2.2.1-2(1)

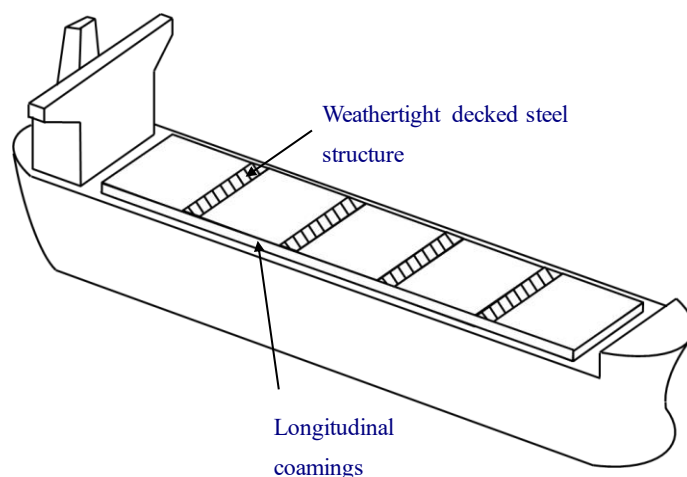




Fig. V2.2.1-2(2)

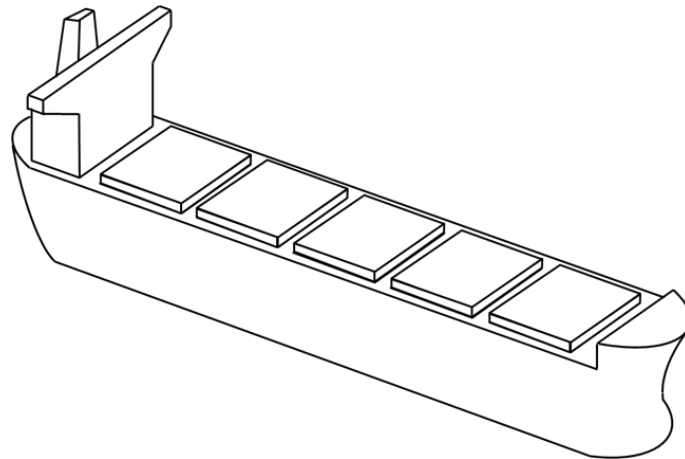
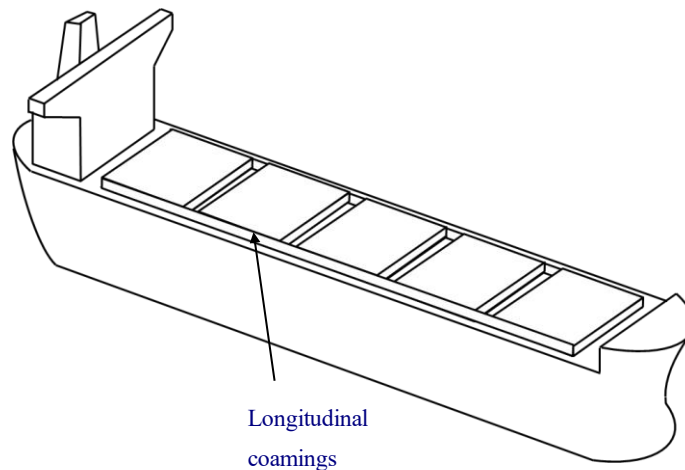


Fig. V2.2.1-2(3)



**13** In the application of Regulation 27(13)(e) of the *ILLC*, ventilators that are for operational reasons have to remain open to supply air to engine rooms, emergency generator rooms or closed ro-ro and vehicle spaces (if the same is either considered buoyant in stability calculations or is considered to be a protected opening leading below) for the effective operation of the ship and that are provided with weathertight closing appliances in accordance with the requirements of **14.12.3.1, Part 1, Part C of the Rules** or **21.6.5-2, Part CS of the Rules**, are to be considered as unprotected openings with regard to the residual range of stability. Where it is not technically feasible to treat some closed ro-ro and vehicle space ventilators as unprotected openings, an alternative arrangement that provides an equivalent level of safety may be used provided that it is deemed appropriate by the Administration.

#### **V2.2.2 Marking of Load Lines**

With respect to the provisions of **2.2.2, Part V of the Rules**, the load line marks and relevant markings are to be permanently marked such as by welding. When plating of metallic material is welded to the hull, precautions need to be taken regarding factors such as the materials used and the electrolytic compatibility of the material with the ship's hull.