

# **RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS**

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

**Part H**

**Electrical Installations**

**Rules for the Survey and Construction of Steel Ships**  
**Part H** **2013 AMENDMENT NO.1**  
**Guidance for the Survey and Construction of Steel Ships**  
**Part H** **2013 AMENDMENT NO.1**

Rule No.38 / Notice No.28      30th May 2013  
Resolved by Technical Committee on 4th February 2013  
Approved by Board of Directors on 4th March 2013

**ClassNK**  
NIPPON KAIJI KYOKAI

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# **RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS**

**RULES**

**Part H**

**Electrical Installations**

## **2013 AMENDMENT NO.1**

Rule No.38      30th May 2013

Resolved by Technical Committee on 4th February 2013

Approved by Board of Directors on 4th March 2013

“Rules for the survey and construction of steel ships” has been partly amended as follows:

## Part H ELECTRICAL INSTALLATIONS

### Chapter 1 GENERAL

#### 1.1 General

##### 1.1.7 Ambient Conditions

Table H1.2 has been amended as follows.

Table H1.2 Angles of Inclination

Installation Components	Athwartships <sup>(1)</sup>		Bow-and-stern <sup>(1)</sup>	
	Static inclination (List)	Dynamic inclination (Rolling)	Static inclination (Trim)	Dynamic inclination (Pitching)
Electrical installations excluding those items started below	15°	22.5°	5° <sup>(3)</sup>	7.5°
Emergency electrical installations, switch gears (circuit breakers, etc.), electric appliances and electronic appliances	22.5° <sup>(2)</sup>	22.5° <sup>(2)</sup>	10°	10°

Notes:

1. Athwartships and bow-and-stern inclinations may simultaneously occur.
2. In ships carrying liquefied gases in bulk and ships carrying dangerous chemicals in bulk, emergency power supplies are to remain operable with the ship flooded to a final athwartships inclination up to a maximum of 30°.
3. Where the length of the ship exceeds 100 m, the fore-and-aft static angle of inclination may be taken as follows:

$$\theta = 500/L$$

$\theta$  : The static angle of inclination (°)

$L$  : Length of the ship specified in 2.1.2, Part A (m)

## Chapter 2 ELECTRICAL INSTALLATIONS AND SYSTEM DESIGN

### 2.9 Cables

Paragraph 2.9.11 has been amended as follows.

#### 2.9.11 Precaution against Fire

1 Cables are to be installed so as to not impair any of their original flame retardant properties.

2 All cables for power, lighting, internal communications, signals and navigational aids of essential and emergency services are to be, as far as practicable, routed clear of all machinery spaces of category A as well as their casings, all galleys, all laundries and any other high fire risk areas. Cables connecting fire pumps to emergency switchboards are to be fire resistant types in cases where they pass through high fire risk areas. All such cables are to be, as far as practicable, run in such a manner as to preclude their being rendered unserviceable by any heating of bulkheads that may be caused by fires in adjacent spaces.

~~3 Cables for those services which are required to be operable under fire conditions are, unless specially approved by the Society, to be fire resistant types, which have passed testing in accordance with IEC publication 60331, in cases where they pass through fire protection boundaries, consisting of bulkheads and decks enclosing stairways, high fire risk areas, machinery spaces of category A or similar spaces and any other decks in accommodation spaces.~~

4~~3~~ Interconnecting cables between generators and main switchboards are to be routed clear of fuel oil purifier spaces, above other generator engines and fuel oil purifiers except in the following (1) to (3):

- (1) Subdivided into at least two groups separated throughout their length as far apart as practicable;
- (2) Fire resistant cables which have passed those tests specified in IEC publication 60331; or
- (3) Protected by means deemed appropriate by the Society.

## Chapter 4 ADDITIONAL REQUIREMENTS FOR SHIPS CARRYING SPECIAL CARGOES

### 4.2 Tankers, Ships Carrying Liquefied Gases in Bulk and Ships Carrying Dangerous Chemicals in Bulk

Paragraph 4.2.1 has been amended as follows.

#### 4.2.1 General

Electrical equipment for tankers, ships carrying liquefied gases in bulk and ships carrying dangerous chemicals in bulk is to comply with ~~all applicable requirements in this Part and chapter as well as the requirements in Chapter 4, Part R, Chapters 10 and 12, Part N and Chapters 10 and 12, Part S.~~

Paragraph 4.2.6 has been amended as follows.

#### 4.2.6 Ventilation in Hazardous Areas

1 Ventilators installed in cargo pump rooms or cargo compressor rooms are to be arranged in order that no discontinuities of ventilation are expected to occur for long periods of time and so that no accumulation of gas or vapours occurs. In cases where of ventilation failures, alarms are to be activated in continually manned spaces, *e.g.* navigation bridges or machinery control rooms, in addition to those relevant cargo pump rooms and cargo compressor rooms.

2 Electric motors for ~~these~~ ventilators specified in -1 above for tankers, ships carrying liquefied gases in bulk and ships carrying dangerous chemicals in bulk are to be placed outside ventilation ducts.

3 ~~These~~ ventilators specified in -1 above for tankers, ships carrying liquefied gases in bulk and ships carrying dangerous chemicals in bulk are to be ones that do not to produce any source of ignition in compliance with the requirements given in 4.5.4-1(1), Part R, 12.1.9, Part N and 12.2.8, Part S.

4 ~~In tankers, notwithstanding these~~ The ventilation air change ratios in cargo pump rooms for tankers, ships carrying liquefied gases in bulk and ships carrying dangerous chemicals in bulk are to comply with the requirements given in 4.5.4-1(1), Part R, 12.1.2, Part N and 12.2.3, Part S. ~~the ventilation air change ratio in cargo pump rooms is to be at least 30 times per hour, based upon the gross volume of such spaces. However, in cases where deemed appropriate by the Society, these requirements do not apply.~~

### EFFECTIVE DATE AND APPLICATION

1. The effective date of the amendments is 30 May 2013.

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# **GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS**

**Part H**

**Electrical Installations**

**GUIDANCE**

**2013 AMENDMENT NO.1**

Notice No.28      30th May 2013

Resolved by Technical Committee on 4th February 2013

AMENDMENT TO THE GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

“Guidance for the survey and construction of steel ships” has been partly amended as follows:

## **Part H ELECTRICAL INSTALLATIONS**

### **H2 ELECTRICAL INSTALLATIONS AND SYSTEM DESIGN**

#### **H2.9 Cables**

Paragraph H2.9.11 has been amended as follows.

##### **H2.9.11 Precaution against Fire**

(-1 and -2 are omitted.)

**3** Those cables to which the requirements given in **2.9.11-2, Part H of the Rules** are to apply are generally those used for the following equipment:

- (1) Motors of auxiliary machinery used for steering gears and main propulsion
- (2) All the lighting systems on board ship
- (3) Internal communications, signals and navigational aids specified in **2.2.8, Part H of the Rules**
- (4) Emergency sources of electrical power, lighting, internal communications, signals and navigational aids required by **3.3.2-2, Part H of the Rules**
- (5) Those services which are required to be operable under fire conditions means the following

(a) to (h):

(a) General alarm systems

(b) Fire alarm systems

(c) Fixed fire-extinguishing systems and their medium release alarms

(d) Fire detection systems

(e) Control and power systems to power operated watertight doors and their status indication

(f) Emergency lighting

(g) Public address systems or other equivalent means of communication

(h) Remote emergency stop/shutdown of equipment specified in **2.2.13-1, Part H of the Rules**

~~(5)~~ Other equipment as deemed necessary by the Society

**4** The wording “fires in adjacent spaces” in **2.9.11-2, Part H of the Rules** generally means those fires from which temperature-time curves are obtainable in those standard fire tests defined in Paragraph 47, Regulation 3, Chapter II-2, the Annex to the *SOLAS* Convention.

**5** The wording “high fire risk areas” in **2.9.11-2 and -3, Part H of the Rules** generally means those places as specified below:

- (1) Cargo holds specified in **4.8, Part H of the Rules**.
- (2) Spaces specified in **9.2.3-2(9)** and **9.2.4-2(9), Part R of the Rules**. However, lockers and store-rooms are to be excluded.
- (3) Machinery spaces as defined in **3.2.30, Part R of the Rules**.

**6** In cases where any installation of cables specified in -3 above in those space specified in **2.9.11-2, Part H of the Rules** is unavoidable, such cables are to be laid in insulated steel pipes or steel ducts equivalent to **A-60** or more unless fire resistant cables which have passed those tests

given in *IEC Publication 331* or any equivalent thereto are used. (See Fig. H2.9.11-1) However, this does not include any cases where the “services which are required to be operable under fire conditions” specified in ~~-3(5)~~ above can be maintained by means of one of the following (1), (2) or (3):

- (1) Self-monitoring of short-circuits and line open faults
- (2) Preservation of the function against short-circuits and line open faults
- (3) Duplication with cable runs as widely separated as is practicable

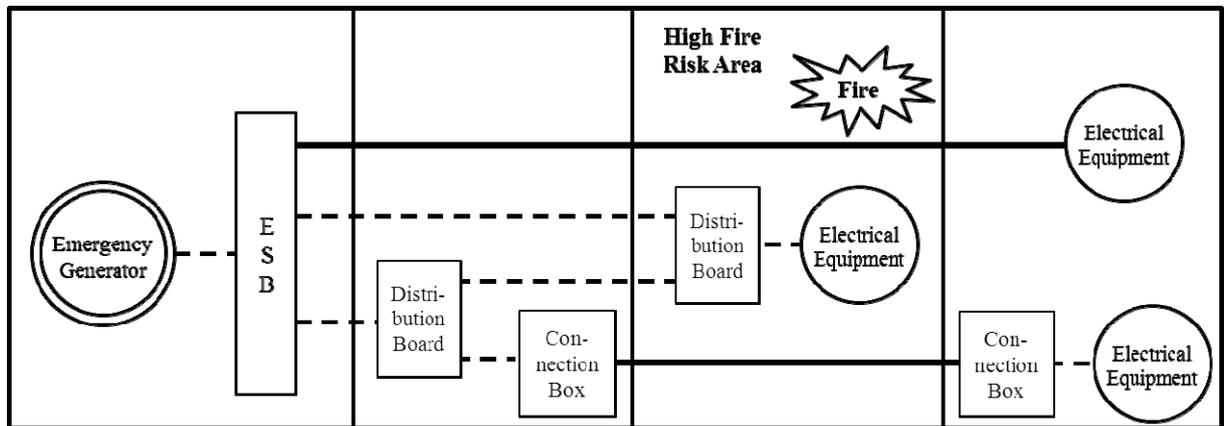
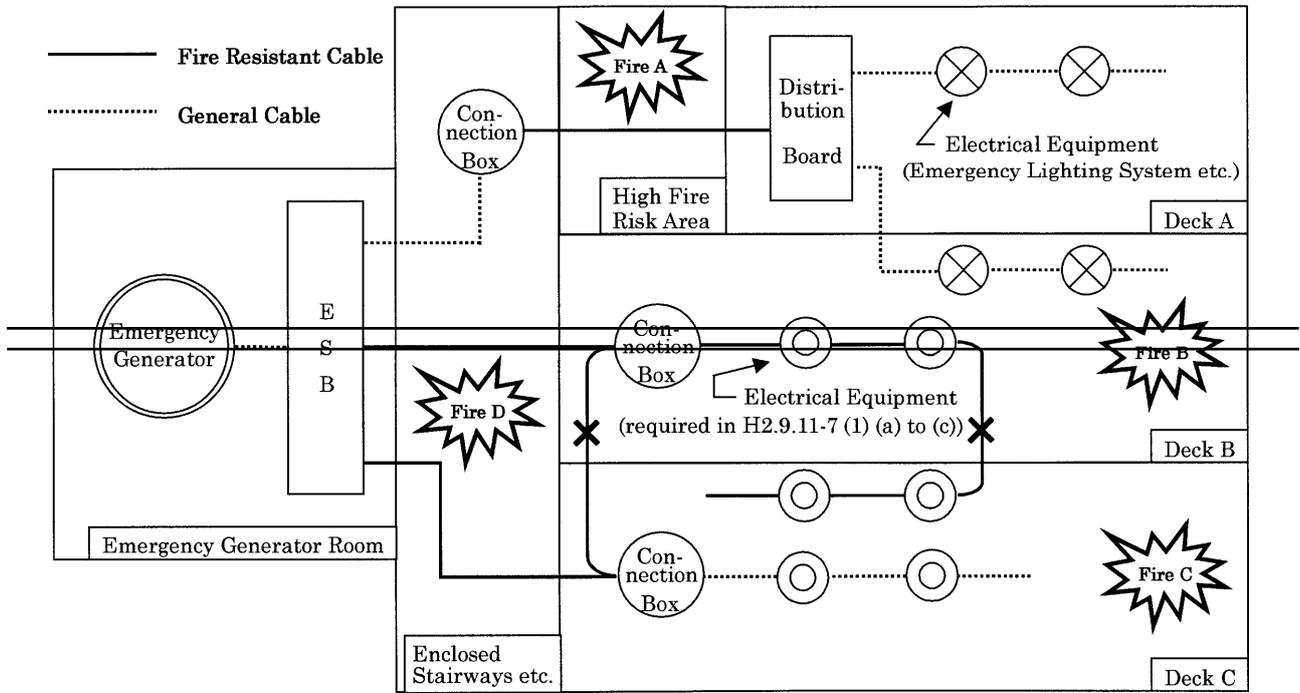
~~7~~ The requirements given in ~~2.9.11-3, Part H of the Rules~~ are to be in accordance with the following:

- ~~(1) Those “services which are required to be operable under fire conditions” means the following services:
  - ~~(a) General alarm systems~~
  - ~~(b) Fire alarm systems~~
  - ~~(c) Fixed fire extinguishing systems and their medium release alarms~~
  - ~~(d) Fire detection systems~~
  - ~~(e) Control and power systems to power operated watertight doors and their status indication~~
  - ~~(f) Emergency lighting~~
  - ~~(g) Public address systems or other equivalent means of communication~~
  - ~~(h) Remote emergency stop/shutdown of equipment specified in 2.2.13-1, Part H of the Rules~~~~
- ~~(2) The wording “similar spaces” means those machinery spaces other than any machinery spaces of category A.~~
- ~~(3) Fire resistant cables are to extend from their distribution points within any spaces containing emergency sources of electrical power to the nearest local distribution boards, connection boxes or the like with in the relevant fire protection boundary. (See Fig. H2.9.11-1)~~
- ~~(4) The wording “specially approved by the Society” means to satisfy any of the following:
  - ~~(a) The functions of systems required to be operable under fire conditions can be maintained by means of one of following i), ii) or iii):
    - ~~i) Self-monitoring of short-circuits and line open faults~~
    - ~~ii) Preservation of the function against short-circuits and line open faults~~
    - ~~iii) Duplication with cable runs as widely separated as is practicable~~~~
  - ~~(b) Such cables are installed on open decks.~~
  - ~~(c) Such cables are used for any of those services listed in (1) above (except for (a) to (c)) and pass through any spaces in accommodation spaces surrounded by fire protection boundaries which consist of bulkheads and decks.~~~~

**§7** Means are to be provided so that fire resistant cables installed in accordance with the requirements given in **2.9.11, Part H of the Rules** are easily distinguishable.

Fig. H2.9.11-1 has been amended as follows.

Fig. H2.9.11-1 Example of Potential Fire Hazards and Application Ranges of Fire Resistant Cables



— : Fire Resistant Cable  
 - - - : General Cable

Notes:

- 1 In the event of any fire in high fire risk areas (Fire A), cables are to be of fire resistant type in such areas so as to not allow any negative impact on the use of any connected electrical equipment.
- 2 For cables used for those services specified in ~~H2.9.11-7(1)(a) to (e)~~, the following are to be required in addition to 1 above so as to not allow any negative impact on the use of any connected electrical equipment in areas surrounded by fire protection boundaries other than in cases where an separate Fire B, C or D has occurred.
  - (1) Cables are to be of fire resistant type in any accommodation spaces surrounded by fire protection boundaries,

~~such as enclosed stairways.~~

- ~~(2) Electrical equipment in two or more of those areas surrounded by fire protection boundaries, such as the electrical equipment in Decks B and C shown in the above figure, are not to be supplied in series so as to not allow any negative impact on the use of any connected electrical equipment in areas other than where a fire has occurred.~~
- ~~(3) Connection boxes in two or more of those areas surrounded by other fire protection boundaries, such as those connection boxes on Decks B and C shown in the figure, are not to be connected in cases where such relevant connection boxes are not of fire resistant types in accordance with IEC 60331 or the equivalent thereto.~~

## **H4 ADDITIONAL REQUIREMENTS FOR SHIPS CARRYING SPECIAL CARGOES**

### **H4.2 Tankers, Ships Carrying Liquefied Gases in Bulk and Ships Carrying Dangerous Chemicals in Bulk**

Paragraph H4.2.6 has been deleted.

#### ~~**H4.2.6 Ventilation in Hazardous Areas**~~

~~**1** The wording “not to produce any source of ignition” in **4.2.6 3, Part H of the Rules** means any construction complying with the requirements given in **R4.5.4 1(2)**.~~

~~**2** The wording “in cases where deemed appropriate by the Society” in **4.2.6 4, Part H of the Rules** means that any electrical equipment installed in cargo pump rooms is limited to lighting fittings and audible indicators for general/fire alarms of flameproof or pressurized types instead of applying those requirements given in **4.2.4 1(2)(c), Part H of the Rules**.~~

## **EFFECTIVE DATE AND APPLICATION**

- 1.** The effective date of the amendments is 30 May 2013.