08-460

# RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

## Part R Fire Protection, Detection and Extinction

**Rules for the Survey and Construction of Steel Ships**
**Part R 2008 AMENDMENT NO.2**
**Guidance for the Survey and Construction of Steel Ships**
**Part R 2008 AMENDMENT NO.2**

Rule No.36 / Notice No.37 29th May 2008
Resolved by Technical Committee on 1st February 2008
Approved by Board of Directors on 26th February 2008

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# RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

## Part R Fire Protection, Detection and Extinction

**2008 AMENDMENT NO.2**

Rule No.36 29th May 2008
Resolved by Technical Committee on 1st February 2008
Approved by Board of Directors on 26th February 2008

Rule No.36 29th May 2008
AMENDMENT TO THE RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

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

# Part R FIRE PROTECTION, DETECTION AND EXTINCTION

## Chapter 4 PROBABILITY OF IGNITION

Section 4.3 has been amended as follows.

### 4.3 Arrangements for ~~Gaseous Fuel~~ Gases for Domestic Purpose

#### 4.3.1 Arrangements for Gaseous Fuel for Domestic Purpose

Gaseous fuel systems used for domestic purposes are to be ~~approved by~~ of suitable type to the satisfaction of the Society. Storage of gas bottles is to be located on the open deck or in a well ventilated space which opens only to the open deck.

#### 4.3.2 Arrangements for Gas Welding Equipments

Gas welding equipments are to be of suitable type to the satisfaction of the Society. Storage of gas bottles is to be located on the open deck or in a well ventilated space which opens only to the open deck.

EFFECTIVE DATE AND APPLICATION

**1.** The effective date of the amendments is 1 July 2008.

**2.** Notwithstanding the amendments to the Rules, the current requirements may apply to ships for which the date of contract for construction is before the effective date.

**3.** Notwithstanding the provision of preceding **2.**, the amendments to the Rules may apply to ships for which the application is submitted to the Society before the effective date upon request by the owner.

# GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE

## Part R Fire Protection, Detection and Extinction

**2008 AMENDMENT NO.2**

Notice No.37 29th May 2008
Resolved by Technical Committee on 1st February 2008

Notice No.37 29th May 2008
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 R FIRE PROTECTION, DETECTION AND EXTINCTION

Amendment 2-1

## R9 CONTAINMENT OF FIRE

### R9.7 Ventilation Systems

Sub-paragraph R9.7.2 has been amended as follows.

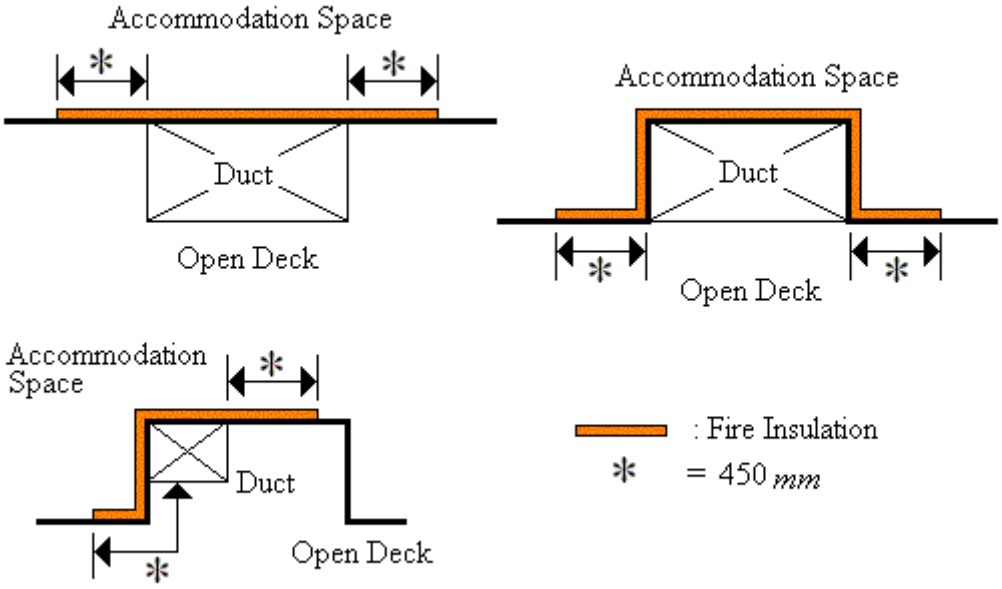
**R9.7.2 Arrangement of Ducts**

**1** Insulation of "*A*-60" class standard specified in **9.7.2, Part R of the Rules** is, as a standard, to be an insulation with rock-wool approved as non-combustible material, or insulation approved as "*A*-60" class.

**2** With respect to the application of **9.7.2, Part R of the Rules**, in cases where a part of a trunk or a duct is contiguous to an enclosed space at outside the space where the trunk or duct is served, such trunk and duct are to be regarded as those passing through other enclosed spaces and the part of the trunks/ducts contiguous to the enclosed space is to be insulated in accordance with the applicable provisions of **9.7.2-1(1)(d)**, **-1(2)(b)** or **-2(2)(b)**, **Part R of the Rules**. (See **Fig. R9.7.2**)

Fig. R9.7.2 has been added as follows.

**Fig. R9.7.2 Examples for Insulation of Ducts**

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Sub-paragraph R9.7.4 has been amended as follows.

**R9.7.4 Exhaust Ducts from Galley Ranges**

**1** With respect to the requirements in **9.7.4, Part R of the Rules**, the exhaust ducts from galley ranges are to be in accordance with the following requirements **(1)** to **(5)**:

(1) The exhaust ducts from galley ranges are, in principle, to be independent from other ducts. In case where this is impracticable, i.e., where the ducts are connected to other ducts for other ventilation purposes, self-closing type fire dampers which can be remotely-operated are to be fitted to the other branch ducts in order to be capable of closing these dampers together with those for galley ranges simultaneously.

(2) Unless otherwise permitted by the Society, the term of "spaces containing combustible materials" will normally apply to all spaces in accommodation.

(3) The wording "exhaust ducts from galley ranges are to be constructed of "*A*" class divisions" means that ducts are to be of steel with a thickness of 4.5 *mm* or more. "*A*" class applies only to the part of the duct outside the galley and the part where such duct piercing a bulkhead.

(4) The fire dampers located at the lower end of the ducts are to be such that they can be readily and safely closed in the galley in case of fire in way of range.

(5) In case where the carbon dioxide gas fire extinguishing system specified in **Chapter 25, Part R of the Rules** is provided as fixed means for extinguishing a fire within the exhaust duct, the quantity of fire extinguishing medium is to be 100% or more of the volume of the duct spaces to be protected.

**2** With respect to the application of **9.7.4, Part R of the Rules**, when a part of an exhaust duct for galley range is contiguous to accommodation spaces or other spaces containing combustible

materials, at outside the galley, such ducts are to be in accordance with the provisions of **R9.7.2-2**.

## EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

**1.** The effective date of the amendments is 29 May 2008.

**2.** Notwithstanding the amendments to the Guidance, the current requirements may apply to ships for which the date of contract for construction* is before the effective date.
*"contract for construction" is defined in IACS Procedural Requirement(PR) No.29 (Rev.4).

### **IACS PR No.29** (Rev.4)

**1.** The date of "contract for construction" of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.

**2**. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.
For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:
(1) such alterations do not affect matters related to classification, or
(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.
The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

**3.** If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

**4.** If a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Notes:
1. This Procedural Requirement applies to all IACS Members and Associates.
2. This Procedural Requirement is effective for ships "contracted for construction" on or after 1 January 2005.
3. Revision 2 of this Procedural Requirement is effective for ships "contracted for construction" on or after 1 April 2006.
4. Revision 3 of this Procedural Requirement was approved on 5 January 2007 with immediate effect.
5. Revision 4 of this Procedural Requirement was adopted on 21 June 2007 with immediate effect.

Amendment 2-2

# R4 PROBABILITY OF IGNITION

Section R4.3 has been amended as follows.

## R4.3 Arrangements for ~~Gaseous Fuel~~ Gases for Domestic Purpose

### R4.3.1 Arrangements for Gaseous Fuel for Domestic Purpose

**1** With respect to the requirements of **4.3.1, Part R of the Rules**, ~~the wording "gaseous fuel systems approved by the Society" means that~~ gas ~~cylinders~~ gas bottles, pipes, valves and pipe fittings ~~for gas cylinders, pipes and horses~~ of the gaseous fuel systems ~~have passed the inspection of organizations authorized by the Administration or~~ are to comply with an international or national standard deemed appropriate by the Administration or the Society, in spite of the provisions of **Part D of the Rules**.

**2** Gas bottles are to be protected appropriately according to characters of used gases. In general, gas bottles are to be stored in areas not exposed to direct sun beam and also safe against waves, flame and high temperature, and secured so that the safety against ship motions and vibrations is ensured.

~~**2**~~**3** With respect to the provisions of **4.3.1, Part R of the Rules**, a portion of open deck, recessed into deck structure, machinery casing, deck house, etc., utilized for the exclusive storage of gas bottles is to comply with the following requirements.

(1) Such a recess is to have an unobstructed opening, except for small appurtenant structures, such as opening corner radii, small sills, pillars, etc. The opening may be provided with grating walls and door.

(2) The depth of such a recess is not to be greater than 1*m*, where the depth means the maximum horizontal distance between the recessed wall and the wall of deck structure, machinery casing, deck house, etc.

**4** A storage space 3 sides of which are closed is to be regarded as a recessed space and comply with the requirements of **-3** above.

~~**3**~~**5** With respect to the provisions of **4.3.1, Part R of the Rules**, where gas bottles are stored in a space other than open decks, such a space is to be provided with appropriate mechanical ventilation. In this context, portions of open deck complying with the provisions in **-~~2~~3** above may be regarded as open decks. Electrical installations provided within storage spaces other than open decks or 3*m* of ventilation outlets for the spaces are to comply with the requirements of **2.1.3-7, Part H of the Rules**.

### R4.3.2 Arrangements for Gas Welding Equipments

**1** With respect to the requirements of **4.3.2, Part R of the Rules**, gas welding equipments using acetylene and oxygen are to conform to the following provisions.

**2** Gas bottles, pipes, valves and pipe fittings of the gas welding equipments are to comply with an international or national standard deemed appropriate by the Administration or the Society, in spite of the provisions of **Part D of the Rules**.

**3** The location of gas bottles is to be as specified below:

(1) Gas bottles are to be stored in areas not exposed to direct sunlight and also safe against waves, fire and high temperature. Appropriate consideration is to be given so that in general the temperature of the bottles is not higher than $40\,^{\circ}C$.

(2) Gas bottles are to be secured so that the safety against ship motions and vibrations is ensured, and they should stand upright. Further, means are to be provided so that the bottles can be transferred quickly in case of fire.

(3) Acetylene bottles and oxygen bottles are to be stored apart as far as practicable.

**4** With respect to the provisions of **4.3.2, Part R of the Rules**, a portion of open deck, recessed into deck structure, machinery casing, deck house, etc., utilized for the exclusive storage of gas bottles is to comply with the following requirements.

(1) The deck area of such a recess is not to be excessive large.

(2) Such a recess is to have an unobstructed opening, except for small appurtenant structures, such as opening corner radii, small sills, pillars, etc. The opening may be provided with grating walls and door.

(3) The depth of such a recess is not to be greater than the width of the recess, where the depth means the maximum horizontal distance between the recessed wall and the wall of deck structure, machinery casing, deck house, etc.

**5** A storage space in which 3 sides are closed is to be regarded as a recessed space and comply with the requirements of **-4** above.

**6** With respect to the provisions of **4.3.2, Part R of the Rules**, where gas bottles are stored in a space other than open decks, such a space is to be provided with appropriate mechanical ventilation. In this context, portions of open deck complying with the provisions in **-4** above may be regarded as open decks. Electrical installations provided within storage spaces other than open decks or 3*m* of ventilation outlets for the spaces are to comply with the requirements of **2.1.3-7, Part H of the Rules**.

**7** Storage spaces exclusively used for oxygen bottles need not to comply with the provisions of **-4(3)** above.

**8** Piping between the gas bottles and working area is to comply with the following provisions.

(1) Steel pipes with corrosion protection are to be used for acetylene gas piping, and steel or copper pipes are to be used for oxygen gas piping. Use of flexible joints made of non-metal material ensleeved in metal sheath in part of the piping may be accepted.

(2) No cast iron is to be used as material for valves and pipe fittings. Further, copper or copper alloy with a copper content exceeding 62% is not to be used as the material of valves and pipe fittings in the acetylene gas piping.

(3) The procedures of piping arrangement are to be as specified below.

(a) Acetylene gas piping and oxygen gas piping are not to be led through the control stations, accommodation spaces, service spaces of high fire risk, machinery spaces and cargo spaces and other enclosed spaces where any installation which is susceptible to fire is installed.

(b) On acetylene gas piping and oxygen gas piping, stop valves are to be fitted at adequate location of the penetrations through the casing of storage room and working area.

(c) Joints between pipes and pipe fittings are to be welded joint or flange joint as far as practicable.

(d) For clear distinction of the acetylene gas piping system and oxygen gas piping system, the piping systems are to be provided with adequate means of identification.

(4) In case where rubber pipes are used between gas bottles and working area, the rubber pipes are to be of the ones complying with the requirements of any recognized standard deemed adequate by the Society according to the type of gas involved.

(5) After completion of shipboard installation, piping systems are to be subjected to air-tightness test at a pressure of 1.25 *times* or more of the maximum working pressure of the pressure regulator.

# R9 CONTAINMENT OF FIRE

## R9.2 Thermal and Structural Boundaries

### R9.2.3 Bulkheads within Accommodation Area

**1** Where spaces are classified for the application of the standards of fire integrity, the requirements specified in **(1)** to **(11)** of **9.2.3-2, Part R of the Rules** and further the requirements given in **Table R9.2.3-1** are also to be complied with. With respect to the provisions of **9.2.3-2, Part R of the Rules**, the wording "smaller, enclosed room" means a room having no entrance to corridors but only therefrom and where someone may occupy during a significant time (*e.g.*, a bed room in a cabin), and the wording "less than 30% communicating openings" means that the total area of the entrance mentioned above is less than 30% of the area of separating bulkheads or divisions. In this connection, locker rooms, store rooms, lavatories for control stations, etc., only having entrance therefrom, whose area is less than 30% of the area of divisions, may be regarded as an integral part of such spaces.

Table R9.2.3-1 has been amended as follows.

**Table R9.2.3-1**

| | |
|---|---|
| Control stations | Spaces containing navigational apparatus (steering stand, compass and radar equipment)<br>Electric rooms (where charging/discharging panels or battery charges are located), battery rooms, motor-generator rooms for navigational apparatus, radio or inverter rooms<br>Spaces containing control systems and storage rooms of fire-extinguishing medium for fixed fire extinguishing systems (See Note **(1)** below) |
| Accommodation spaces | Telephone rooms (Telephone booths) |
| Service spaces with low risk of fire | Shore connection box rooms<br>Electric rooms (where transformers, switchboards (see Note **(2)** below), motor-generators, etc. of less than 50 *kVA* (*kW*) are located and having area s of less than 4 $m^2$)<br>Space where distribution panels and starters are located<br>Accommodation ladder winch machinery rooms<br>Ballast control rooms, main cargo control rooms |
| Other machinery spaces | Electric rooms (except those categorized as "control stations" or "service spaces with low risk of fire")<br>Storage rooms for hydraulic units for deck machinery and cargo gears<br>Propulsion motor rooms, Propulsion motor control rooms<br>Steering gear rooms (See Note **(3)** below)<br>Emergency fire pump rooms (See Note **(4)** below)<br>Spaces containing deck foam systems (See Note **(5)** below)<br>Spaces other than machinery spaces of category *A* where fuel oil piping lines are located<br>Inert gas fan rooms |
| Service spaces with high risk of | ~~Oxygen or acetylene bottle storage~~ Storage rooms for gaseous fuel (See Note **(6)** below) |

| | |
|---|---|
| fire | Storage rooms for gas welding equipments (See Note **(7)** below)<br>Jumper lockers<br>Mail rooms, specie rooms and workshops<br>Provision store rooms (See Note **(~~7~~8)** below)<br>Refrigerating chambers (See Note **(~~8~~9)** below) |
| Other spaces | 1. To duct spaces and cable trunks, the requirements of **9.2.3-6, Part R of the Rules** for lift trunks are to apply.<br>2. Under deck passages of container ships with self-closing gas-tight doors separating the spaces from cargo spaces effectively, are to be regarded as void spaces. However, in case where they serve as escape route, they are to be regarded as corridors. |

Notes:

(1) Except where permitted to be stored in the space protected by that fixed fire-extinguishing system according to the type of the system.

(2) Small distribution boards may be located behind panels/linings within accommodation spaces including stairway enclosures, provided no provision is made for storage. Such location need not to be considered as a separate space nor categorized as a service space with low risk of fire.

(3) In case where an emergency fire pump is installed in the steering gear room or spaces which are only accessible directly therefrom (except from the engine room specified in **R10.2.2-4**), the fire integrity of boundaries between the space where the main fire pump is installed and the steering gear room is to be in accordance with **R10.2.2-3**.

(4) The fire integrity of boundaries separating from the space where the main fire pump is installed is to be in accordance with **10.2.2-3(2), Part R of the Rules**.

(5) Attention is paid to the provisions of **R4.5.2-3** and **-4**.

(6) The provisions of **4.3.1, Part R of the Rules** are to apply. In case where a portion of open deck, recessed into deck structure, machinery casing, deck house, etc., utilized for the exclusive storage of gas bottles in accordance with the provisions of **R4.3.1-2**, such a location may be regarded as open decks.

(7) The provisions of **4.3.2, Part R of the Rules** are to apply. In case where a portion of open deck, recessed into deck structure, machinery casing, deck house, etc., utilized for the exclusive storage of gas bottles in accordance with the provisions of **R4.3.1-4** or **-7**, such a location may be regarded as open decks.

(~~7~~8) Such spaces having areas of less than 4 $m^2$ may be considered as a service space with low risk of fire.

(~~8~~9) If thermally insulated with non-combustible materials, such spaces may be considered as a service space with low risk of fire.

## EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

**1.** The effective date of the amendments is 1 July 2008.

**2.** Notwithstanding the amendments to the Guidance, the current requirements may apply to ships for which the date of contract for construction is before the effective date.

**3.** Notwithstanding the provision of preceding **2.**, the amendments to the Guidance may apply to ships for which the application is submitted to the Society before the effective date upon request by the owner.

Amendment 2-3

# R27 FIXED PRESSURE WATER-SPRAYING AND WATER-MIST FIRE-EXTINGUISHING SYSTEMS

## R27.2 Engineering Specifications

Paragraph R27.2.1 has been amended as follows.

### R27.2.1 Fixed Pressure Water-spraying Fire-extinguishing Systems

**1** "Approved system" specified in **27.2.1, Part R of the Rules** means a system approved in accordance with the "*Guidelines for the approval of equivalent water-based fire-extinguishing systems for machinery spaces and cargo pump rooms*" (*MSC/Circ.*1165).

**2** An application of MSC/Circ.1165 is to be made in accordance with the following **(1)** and **(2)**.

(1) For the 3 $m^2$ top tray of the engine mock-up specified in 4.2.1 of APPENDIX *B* to *MSC/Circ.*1165, test fuel level is to be 50 *mm*, regardless of the freeboard stipulated in 4.5.1 of the appendix.

(2) Fire-extinguishing tests with flowing fire (Test No.6) stipulated in 4.3.1 of APPENDIX *B* are to be carried out in accordance with the following procedures.

(a) The 4 $m^2$ fire tray below the engine mock-up is to be filled with a 50 *mm* water base and heptane up to a level of the tray's freeboard being 150±10 *mm*.

(b) The 3 $m^2$ fire tray on top of the engine mock-up is to be filled with a 40 *mm* water base and heptane up to a level of the fuel being 50 *mm*.

(c) The fuel is to be ignited when flowing down the side of the engine mock-up approximately 1 *m* below the notch.

(d) The pre-burn time stipulated in 4.5.4.1 of the appendix is to be measured from the ignition of heptane.

Paragraph R27.2.2 has been amended as follows.

### R27.2.2 Equivalent Water-mist Fire-extinguishing Systems

**1** "Approved system" specified in **27.2.2, Part R of the Rules** means a system approved in accordance with the "*Guidelines for the approval of equivalent water-based fire-extinguishing systems for machinery spaces and cargo pump rooms*" (*MSC/Circ.*1165).

**2** An application of MSC/Circ.1165 is to be made in accordance with **R27.2.1-2** above.

EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

**1.** The effective date of the amendments is 1 July 2008.

**2.** Notwithstanding the amendments to the Guidance, the current requirements may apply to systems for ships the keels of which were laid or which were at *a similar stage of construction* before the effective date.

(Note) The term "*a similar stage of construction*" means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 *tonnes* or 1%* of the estimated mass of all structural material, whichever is the less.

* For high speed craft, "1%" is to be read as "3%".