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NEWBUILDINGS  
MACHINERY AND SYSTEMS – MAIN CLASS

**Fire Safety**

JANUARY 2011

*This chapter has been amended since the main revision (January 2011), most recently in July 2011.  
See “Changes” on page 3.*

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# FOREWORD

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The Rules lay down technical and procedural requirements related to obtaining and retaining a Class Certificate. It is used as a contractual document and includes both requirements and acceptance criteria.

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## CHANGES

### General

As of October 2010 all DNV service documents are primarily published electronically.

In order to ensure a practical transition from the “print” scheme to the “electronic” scheme, all rule chapters having incorporated amendments and corrections more recent than the date of the latest printed issue, have been given the date January 2011.

An overview of DNV service documents, their update status and historical “amendments and corrections” may be found through [http://www.dnv.com/resources/rules\\_standards/](http://www.dnv.com/resources/rules_standards/).

### Amendments July 2011

- **General**

— The restricted use legal clause found in Pt.1 Ch.1 Sec.5 has been added also on the front page.

### Main changes

Since the previous edition (July 2008), this chapter has been amended, most recently in July 2010. All changes previously found in Pt.0 Ch.1 Sec.3 have been incorporated and a new date (January 2011) has been given as explained under “General”.

In addition, the layout has been changed to one column in order to improve electronic readability.

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## **SECTION 1 GENERAL REQUIREMENTS**

### **A. Application**

#### **A 100 Application**

**101** Unless explicitly stated, the requirements of this chapter do not apply to:

- ships of war and troopships
- ships not propelled by mechanical means
- wooden ships of primitive build
- pleasure yachts not engaged in trade
- fishing vessels.

### **B. Scope of Work**

#### **B 100 Classification**

**101** The requirements in Sec.2 apply to cargo ships of less than 500 gross tonnage assigned main class.

**102** The requirements in Sec.3 apply to cargo ships of 500 gross tonnage and above assigned main class.

**103** Supplementary requirements will be enforced for ships with additional class notations as required by the respective parts of the rules.

**Guidance note:**

Other requirements in Pt.1, Pt.2, Pt.3 and Pt.4 may apply in addition to these rules.

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#### **B 200 SOLAS safety certificates**

**201** It is the responsibility of the government of the flag state to ensure that ships are provided with the fire safety measures required by the International Convention for the Safety of Life at Sea, 1974, as amended (hereafter referred to as SOLAS) when such requirements apply.

**202** Where the government of the flag state has authorised the Society to issue the SOLAS safety certificates on its behalf, the Society will give effect to the fire protection, detection and extinction requirements of Ch.II-2 of SOLAS.

**203** The requirements in Sec.4 apply as the basis for stating compliance with Ch.II-2 of SOLAS and as part of the basis for the issue of SOLAS safety certificates. Compliance with requirements in Sec.4 will automatically result in compliance with requirements in Sec.3 for assignment of main class.

### **C. Submission of Documentation**

#### **C 100 General**

**101** Verification of design is based on an assessment of plans and documentation containing relevant information elements.

**102** Plans and documentation shall be submitted for assessment as required by Sec.2, Sec.3 and Sec.4 respectively depending on the Society's scope of work.

### **D. Applicable referenced Regulations**

#### **D 100 Definitions**

**101** For definitions, see SOLAS Ch.II-2 Reg.3.

#### **D 200 Applicable IACS unified interpretations**

**201** The following IACS unified interpretations apply:

- UI SC125
- UI SC17.

## SECTION 2

### FIRE SAFETY MEASURES FOR CARGO SHIPS OF LESS THAN 500 GROSS TONNAGE

#### A. General

##### A 100 Application

**101** The requirements in this section apply to cargo ships of less than 500 gross tonnage assigned main class and which are in line with IACS IG2 for ships with unrestricted service.

**102** Where the government of the flag state has prescribed specific rules and regulations for fire safety measures, such rules and regulations may be considered as the basis for assignment of main class on the condition that they are deemed to provide a level of safety acceptable to the Society.

##### A 200 Submission of documentation

**201** Plans and documentation given in Table A1 shall be submitted for approval.

**202** Documentation types listed in Table A1 are defined in Pt.0 Ch.3 and give reference to specific parts of the rules for the scope of verification.

Table A1 Information elements to be submitted for approval			
<i>Preferred plan or document</i>	<i>Document type, ref. Pt.0 Ch.3</i>	<i>Information elements</i>	<i>Verification reference</i>
Structural fire protection plan	G060	— Details of fire insulation and specification of materials and doors. — Application of fire rated divisions for all areas and spaces	B700
Penetration details drawing	V060	— Details of ventilation duct penetrations through fire divisions — Details of cable penetrations through fire divisions — Details of pipe penetrations through fire divisions	B700
Fire main system drawing	S010 S030 Z030	— Fire pumps — Arrangement and construction details of fire main and isolating valves — Number and positions of hydrants and hoses — Fire pump capacity calculations	B100
Arrangement drawings for each fixed fire-extinguishing system (if relevant)	V060	— Specification and location of all equipment — Reference to equipment certificates — Calculations for the quantity of the media used and the proposed rates of application — Release instructions — Control and monitoring system	B400
Escape route plan	G120	— Arrangement of escape routes including stairways, escape trunks and escape ladders	B600
Fire control plan	G040	— Showing all fire safety measures onboard	B

**203** For fire safety component and systems the following shall be submitted for approval or review:

- copies of the DNV type approval certificates, or
- fire test reports for the constructions and equipment which shall be used onboard, or
- type approval certificate issued by flag state (including MED as applicable).

**204** Piping used in fire safety systems, shall unless stated otherwise, be in compliance with Pt.4 Ch.6.

#### B. Suppression of Fire

##### B 100 Fire pumps

**101** Ships above 150 gross tonnage shall be provided with at least one independent power driven fire pump.

**102** Ships of 150 gross tonnage and below shall be provided with at least one power driven fire pump, which may be driven by the main engine.

**103** The capacities of the main fire pumps referred to in either 101 or 102 shall be as required for ships of 500 gross tonnage and above (ref. SOLAS Ch. II-2/10.2.2) but shall not be less than 15 m<sup>3</sup>/hour.

**104** In every such ship, there shall be provided, in a position outside the space containing the main fire pumps, an additional:

- power driven fire pump for ships above 150 gross tonnage
- hand-operated fire pump for ships of 150 gross tonnage and below.

The additional pump shall have sufficient capacity and pressure to provide a 6 m jet throw with nozzles not less than 10 mm diameter. The jet throw shall be capable of being directed on to any part of the ship.

### **B 200 Fire mains and hydrants**

**201** The fire main shall have a diameter of sufficient size to maintain a steady distribution and pressure.

**202** A sufficient number of fire hydrants shall be provided and so located that at least one powerful jet of water can reach any normally accessible part of the ship. At least one hydrant shall be provided in the machinery space.

**203** Not less than three (3) fire hoses of at least 15 m in length, complete with couplings and nozzles, shall be provided.

**204** The nozzles shall be of dual purpose (spray/jet) type with 12 mm jet and integral shut-off. The jet may be reduced to 10 mm and shut-off omitted for hand pump hoses.

### **B 300 Fire extinguishers**

**301** The capacity of every portable fire extinguisher shall be at least equivalent to that of a 9 L liquid extinguisher.

**302** Not less than three (3) portable fire extinguishers shall be provided in the accommodation and service spaces.

**303** Not less than two (2) portable fire extinguishers, suitable for extinguishing oil fires, shall be provided in each boiler room, cargo pump room and spaces containing any part of any oil fuel installation.

**304** In machinery spaces containing internal combustion machinery, one (1) portable fire extinguisher shall be provided for every 375 kW of engine power, however, the total number shall not be less than two (2) and need not exceed six (6).

**305** For ships above 150 gross tonnage, at least one fire extinguisher equivalent to that of at least one (1) 45 L liquid extinguisher shall be provided in every machinery spaces of category A.

### **B 400 Fixed fire-extinguishing systems**

**401** For ships above 350 gross tonnage, a fixed fire-extinguishing system shall be provided in machinery spaces of category A and in cargo pump rooms. The system shall be as required for ships of 500 gross tonnage and above (ref. SOLAS Ch. II-2/10.4)

### **B 500 Cargo tank protection**

**501** Mobile foam applicators shall be provided on cargo tank decks.

### **B 600 Fire-fighter's outfits**

**601** Ships above 150 gross tonnage shall be provided with at least two (2) complete sets of fire-fighter's outfits stored in separate locations. Ships of 150 gross tonnage and below shall be provided with at least one (1) complete set of fire-fighter's outfit.

**602** The fire-fighter's outfits shall be as required for ships of 500 gross tonnage and above (ref. SOLAS Ch. II-2/10.10).

### **B 700 Structural fire protection**

**701** Boundaries of the wheelhouse and of the machinery spaces shall be A-60 class against adjacent spaces. Where, in the opinion of the Society, the adjacent spaces are of negligible fire risk, the boundaries may be A-0 class.

**702** Boundaries of escape routes shall be of B-0 class.

## **C. Escape**

### **C 100 Means of escape**

**101** Escape routes shall be maintained in a safe condition, free of obstacles, and shall be easily accessible and clearly marked.

**102** At least one (1) escape route shall be available from all spaces or groups of spaces normally accessible to the crew.

**103** At least two (2) widely separated escape routes shall be provided from the accommodation and service spaces (at each level).



## SECTION 3 FIRE SAFETY MEASURES FOR CARGO SHIPS OF 500 GROSS TONNAGE AND ABOVE

### A. General

#### A 100 Application

**101** The requirements in this section apply to cargo ships of 500 gross tonnage and above assigned main class.

#### A 200 Submission of documentation

**201** The fire control plan shall be submitted for information.

### B. Fire Control Plans

#### B 100 Fire control plans

(SOLAS Ch. II-2/15.2.4)

**101** General arrangement plans shall be permanently exhibited for the guidance of the ship's officers, showing clearly for each deck:

- the control stations
- the various fire sections enclosed by "A" class divisions
- the sections enclosed by "B" class divisions together with particulars of the fire detection and fire alarm systems
- the sprinkler installation
- the fire-extinguishing appliances
- means of access to different compartments, decks and such like
- the ventilating system including particulars of the fan control positions, the position of dampers and identification numbers of the ventilating fans serving each section.

Alternatively, at the discretion of the Society, the aforementioned details may be set out in a booklet, a copy of which shall be supplied to each officer, and one copy shall at all times be available on board in an accessible position. Plans and booklets shall be kept up to date; any alterations thereto shall be recorded as soon as is practicable. Descriptions in such plans and booklets shall be in the language or languages required by the Society. If the language is neither English nor French, a translation into one of those languages shall be included.

**102** A duplicate set of fire control plans or a booklet containing such plans shall be permanently stored in a prominently marked weathertight enclosure outside the deckhouse for the assistance of shore-side fire-fighting personnel.

**Guidance note:**

Refer to "Graphical symbols for shipboard fire control plans" adopted by IMO by Res. A.952(23).

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## SECTION 4 FIRE SAFETY MEASURES FOR ISSUANCE OF SOLAS SAFETY CERTIFICATES

### A. General

#### A 100 Application

**101** The requirements in this section apply when the government of the flag state has authorised the Society to issue the SOLAS safety equipment certificate (CEC) and SOLAS safety construction certificate (CCC) on their behalf.

**102** These requirements are supplemented by those given in the publication “DNV Statutory Interpretations”.

#### A 200 Purpose

**201** The purpose of this section shall provide a set of clarifying requirements for Ch.II-2 of SOLAS. The clarifying requirements are made up of the Society’s and IACS’ interpretations to Ch.II-2 of SOLAS and are meant as a further detailing and clarification of the basic SOLAS requirement.

#### A 300 Scope

**301** Requirements in Ch.II-2 Regs.1-3, 4.3, 4.4, 5-10, 11.1-11.4, 12-20 of SOLAS are considered as part of the Society's scope under the authorization from the government of the flag state.

**302** Where IMO has issued interpretations to Ch.II-2 of SOLAS, such interpretations are regarded as part of SOLAS and the Society's scope.

**303** Statutory interpretations provided by the Society are published separately as the publication “DNV Statutory Interpretations”.

**304** If any contradictory requirements are identified, the requirements of Ch.II-2 of SOLAS and of the FSS-Code shall prevail.

#### A 400 Submission of documentation

**401** Plans and documentation given in Table A1 shall be submitted for approval.

**402** Documentation types listed in Table A1 are defined in Pt.0 Ch.3.

**403** Table A1 includes a column marked "Verification Reference" which gives reference to specific parts of Ch.II-2 of SOLAS and indicates the detailed scope of the verification covered herein.

<b>Table A1 Information elements to be submitted for approval</b>			
<i>Preferred plan or document</i>	<i>Document type, ref. Pt.0 Ch.3</i>	<i>Information elements</i>	<i>Verification reference</i>
Fire Control Plan	G040	— Equipment as described in SOLAS Ch.II-2/ Reg.15.2.4	SOLAS Ch.II-2, Regulations: 10.3, 10.10, 15.2.4, 19.3.6, 19.3.7 and 20.6.2 as applicable
Structural fire protection plan	G060	— Method of construction — Categories of spaces — Details of fire insulation and specification of materials and doors — Application of fire rated divisions for all areas and spaces — Draught stops	SOLAS Ch.II-2, Regulations: 4.4, 5.3, 6, 8.4, 9.2, 9.4, 9.5, 9.6, 11.2, 11.3, 11.4, 19.3.8, 20.2.2 and 20.5 as applicable
Ventilation system drawing	V010 V050	— Duct layout and construction details — Specification of fire insulated ducts — Position, dimension and details of fire dampers — Arrangement of means of control for closure of openings and stop of ventilation fans	SOLAS Ch.II-2, Regulations: 5.2, 8.2, 8.3, 8.5, 9.7, 19.3.4 and 20.3.1 as applicable
Penetration details drawing	V060	— Details of ventilation duct penetrations through fire divisions — Details of cable penetrations through fire divisions — Details of pipe penetrations through fire divisions	SOLAS Ch.II-2, Regulation 9.3
Escape route plan	G120	— Arrangement of primary and secondary escape routes including stairways, escape trunks and escape ladders — Width of escape routes including doors — Inclination of stairways/ladders	SOLAS Ch.II-2, Regulation 13

<b>Table A1 Information elements to be submitted for approval (Continued)</b>			
<i>Preferred plan or document</i>	<i>Document type, ref. Pt.0 Ch.3</i>	<i>Information elements</i>	<i>Verification reference</i>
Fire main system drawing	S010 S030 Z030	<ul style="list-style-type: none"> <li>— Fire pumps including emergency fire pump</li> <li>— Arrangement and construction details of fire main and isolating valves</li> <li>— Number and positions of hydrants and hoses</li> <li>— Fire pump capacity calculations</li> </ul>	SOLAS Ch.II-2, Regulation 10.2
Arrangement drawings for fixed fire-extinguishing system in machinery spaces	S010 S030 Z030 Z160	<ul style="list-style-type: none"> <li>— Specification and location of all equipment</li> <li>— Reference to equipment certificates</li> <li>— Calculations for the quantity of the media used and the proposed rates of application</li> <li>— Release instructions</li> <li>— Control and monitoring system</li> </ul>	SOLAS Ch.II-2, Regulations: 10.4 and 10.5
Arrangement drawings for fixed local-application fire-extinguishing system in machinery spaces	S010 S030 Z030 Z160	<ul style="list-style-type: none"> <li>— Reference to equipment certificates</li> <li>— Specification and location of all equipment</li> <li>— Calculations for the quantity of the media used and the proposed rates of application</li> <li>— Release instructions</li> <li>— Control and monitoring system</li> </ul>	SOLAS Ch.II-2, Regulations: 10.4 and 10.5.6
Arrangement drawings for fixed fire-extinguishing system in cargo spaces (if relevant)	S010 S030 Z030 Z160	<ul style="list-style-type: none"> <li>— Specification and location of all equipment</li> <li>— Reference to equipment certificates</li> <li>— Calculations for the quantity of the media used and the proposed rates of application</li> <li>— Release instructions</li> <li>— Control and monitoring system</li> </ul>	SOLAS Ch.II-2, Regulations: 10.4, 10.7, 10.8, 10.9, 19.3.1, 19.3.9 and 20.6.1 as applicable
Arrangement drawings for each fixed fire-extinguishing system in service spaces, accommodation spaces and other spaces (if relevant)	S010 S030 Z160	<ul style="list-style-type: none"> <li>— Specification and location of all equipment</li> <li>— Reference to equipment certificates</li> <li>— Calculations for the quantity of the media used and the proposed rates of application</li> <li>— Release instructions</li> <li>— Control and monitoring system</li> </ul>	SOLAS Ch.II-2, Regulations: 10.4, 10.6.3, 10.6.4
Arrangement drawings for automatic sprinkler, fire detection and fire alarm system (if relevant)	S010 S030 Z160	<ul style="list-style-type: none"> <li>— Sprinklers grouped into sections</li> <li>— Specification and location of, pumps, tanks, alarms and activators</li> <li>— Relevant information as specified for arrangement drawings for fixed fire detection and fire alarm system</li> </ul>	SOLAS Ch.II-2, Regulations 10.6.1 and 10.6.2 as applicable
Arrangement drawings for fixed fire detection and alarm systems	I200 Z030	<ul style="list-style-type: none"> <li>— Specification of control panel (central unit), indication units, detectors, alarm devices and manual call points</li> <li>— Location of equipment including cable routing and loops</li> <li>— Power supply arrangement</li> <li>— Details of smoke extraction system (where relevant)</li> </ul>	SOLAS Ch.II-2, Regulations 7, 19.3.3 and 20.4 as applicable
Arrangement plan for helicopter deck (as relevant)	S010 S030 Z030	<ul style="list-style-type: none"> <li>— Details of construction</li> <li>— Means of escape</li> <li>— Fire-fighting appliances</li> <li>— Drainage Facilities</li> <li>— Helicopter refuelling and hangar facilities</li> </ul>	SOLAS Ch.II-2, Regulation 18

**404** For constructions and equipment required by SOLAS to be tested in accordance with the Fire Test Procedure Code the following applies:

- copies of the certificates of approval and fire test reports for the equipment that shall be used onboard, but which have not been approved by the Society or the government of the flag state, shall be submitted for approval.