Guidance For Classification And Construction

Part 4 Special Equipment and Systems

Volume C

GUIDANCE FOR EQUIPMENT ON FIRE FIGHTING SHIP

2018

Biro Klasifikasi Indonesia

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The following guidance come into force on 1st July 2018.

Amendments to the preceding Edition are marked by red color and expanded text. However, if the changes involves a whole section or sub section, normally only the title will be in red colour.

Foreword

This 2018 edition supersedes the guidance for equipment on fire fighting ships 1996 edition. In this 2018 edition, there is no major changes have been made in whole of the guidance.

Section 1 consists of general requirements

Section 2 consists of basic requirements

Section 3 consists of fire protection and extinguishing equipment.

The reference sources of the rules are mainly derived from SOLAS, FSS Code and inputs from internal BKI.

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Guidance Amendment Notice

These pages contain amendments within the following section of the guidance, 2018 Edition.

These amendments will come into force on 1st July 2018.

Paragraph	Title/Subject	Status/Remark
Section 3 – Fire Protection And Extinguishing Equipment		
A	**Range of Appliances and Equipment**	
A.1.	No Title	To add provision
E	**Pumps, Sea Connection, And Pipeline**	
E.1	Pumps	To add definition
G	**Fire-Fighter's Outfit**	
G.1.	Range of Fire-fighter's Outfit Required	To add definition
G.2.	Storage Of Fire-fighter's Outfit	To add definition

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Section 1 General Requirements and Guidance

A. General 1–1
B. Notation to the Character of Classification 1–1
C. Documents for Approval 1–1
D. Trials and Surveys 1–2
E. Reference to Further Rules 1–2

A. General

1. Scope

1.1 These guidance apply to equipment on ships for firefighting and rescue work on offshore installations, harbour facilities and ships.

1.2 The range of the equipment is determined by the type of duty for which the ship is intended and is denoted by a notation affixed to the character of classification of the machinery in accordance with B.

B. Notation to the Character of Classification

FF1 : Ships for fighting fires in the initial stage and for rescue operations in the immediate vicinity of the burning installation

FF2 : Ships for the prolonged fighting of major fires and for cooling parts of the burning installation

FF3 : Same as **FF2** but with greater fire extinguishing capacity and more extensive firefighting equipment

FF1/2 and **FF1/3**: Ships of types **FF2** or **FF3** which are additionally equipped for the rescue functions of type **FF1**.

C. Documents for Approval

Each of the following documents is to be submitted electronically for approval:

- Manual covering the handling of the ship, the fire extinguishing systems and other shipboard equipment while in action
- General drawing showing the arrangement of all the fire extinguishing equipment called for in these regulations and giving details of the types and performances of pumps and monitors.
- Drawing showing the disposition and design of the sea connections and sea chests for the fire-fighting system.
- Drawings showing the seatings of the water monitors and giving details of their method of mounting.
- Arrangement drawing and diagram of the remote-control equipment for the water and foam monitors.
- Details of the disposition of fireman's outfits and of the compressor for the refilling of breathing air cylinders.
- Details of the location, type, capacity and class of protection of the searchlights.

- Proof that the ship's propulsion plant and thrusters are capable of holding it on station and in the required direction against the resultant forces of the monitors.
- Proof of the maximum heeling moment corresponding -to the maximum output of all the monitors in any direction.
- Documentation showing the stability in. all operating conditions based on the results of a recognized heeling experiment.
- Energy balance allowing for the simultaneous operation of all the consumers required when in action such as fire pumps, thrusters, active rudders, water- spray system:

According to the notation to the character of classification concerned, the following documents are also to be submitted electronically:

For FF1:

Diagram of the water-spray system and of the disposition of nozzles, pumps and valves together with the calculation of the water consumption.

For FF2:

Details of the type and performance of the portable foam generator and of the sitting of the storage tanks for the foam concentrate.

For FF3:

Details of the type and performance of the portable foam generator and of the sitting of the storage tanks for the foam concentrate.

plan of the permanently installed foam system including the stroage tanks, mixing unit, and pipeline.

D. Trials and Surveys

When the ship has been completed and all the systems installed, an operational test is to be performed including verification of the equipment performance.

The heeling angle of the ship with the monitors in operation is to be determined on the basis of the most unfavourable conditions.

All equipment is to be submitted annually to external inspection and an operational test.

On the occasion of a class renewal the pumps and their drive motors together with the sea chests and the sea connections are to be inspected in accordance with the rules for classification applicable to the machinery plant.

E. Reference to Further Rules

In addition to these guidance, Rules (Pt.1, Vol. II, Pt.1, Vol. III and Pt.1, Vol. IV) of the "BKI Rules for the Classification and Construction of Seagoing Steel Ships" are also applicable.

The choice of materials and the testing of pumps for supplying water to monitors and water-spray system shall conform to Rules for Machinery Installations (Pt.1, Vol. III) Sec.11.D.7.

Section 2 Basic Requirements

A. Manual 2–1
B. Manoeuvrability 2–1
C. Stability 2–1
D. Lighting 2–2

A. Manual

1. The approved manual for operatng, testing, and maintenance shall be carried on board.

2. The first part of this manual should contain an accurate description of the ship's firefighting systems and equipment together with the relevant instructions for operation, testing and maintenance. The second part should contain instructions for the operation of the ship when in operation.

3. Information regarding line of responsibility and delegation of tasks, description of each fire fighting system and the equipment covered by the classification, safety precautions and start-up procedures, instructions for use, testing, and maintenance of the fire fighting installations and the equipment (or may be only referred to), instruction for operation of the vessel during fire fighting ,plan, and records for periodically testing and drills shall be included in the operatioan manual.

B. Manoeuvrability

1. In calm weather the main propulsion plant, the thrusters and the steering gear system must enable the ship to maintain its position and direction whatever the output and direction of operation of the monitors. Whatever the position of the monitors, 80% of the available power should be sufficient to achieve this.

2. In order to maintain full manoeuvrability, suitable control devices and interlocks are to be used to prevent overloading of the ship's mains.

3. When the consumption of electrical power exceeds 90% of the available capacity, a visual and audible alarm shall be provided on the bridge.

4. A control system for thrust and thrust direction, e.g. joystick system, shall be installed.

5. The operation of the side thruster(s) and the main propeller(s) shall be simple and limited to the adjusment of resultant thrust vector for the vessel, possible adjusment of the turningn moment, possible adjusment of heading (gyro stabilisied).

6. Operation shall be arragened at the workstation where the monitorrs are controlled.

C. Stability

1. The ship must be able to withstand the maximum heeling moment resulting from the operation of all the monitors.

D. Lighting

1. For operation in the dark, at least 2 permanently installed searchlights are to be provided which are to be fitted with maintenance-free lamps and capable of orientation in any direction.

2. The capacity of the searchlights shall be such as to produce a luminous intensity of 50 lux over an area at least 11 m in diameter at a distance of 250 m in good visibility.

Section 3 Fire Protection and Extinguishing Equipment

A. Range of Appliances and Equipment 3–1
B. Water - Spray System 3–2
C. Water Monitor System 3–2
D. Foam Monitor System 3–3
E. Pumps, Sea Connections and Pipeline 3–3
F. Portable Fire Extinguishing Equipment 3–4
G. Firefighter Outfit 3–5

A. Range of Appliances and Equipment

1. The Items of equipment corresponding to the various notations to the character of classification are shown in Table 3.1.

2. For pumps involved in firefighting service, a performance test is to be carried out in manufactures workshop under BKI supervision

Table 3.1

Notation to the character of classification	FF1	FF2		FF3
Water monitors	2	3	4	4
Output [m^3 / h] per monitor	1200	2400	1800	2400
Length of throw [m] [1]	120	150		150
Height of throw [m] [2]	45	70		70
Pumps	1 - 2	2-4		2-4
Total pump capacity [m^3/ h]	2400	7200		9600
Foam monitors	-	-		2
Supply of foam concentrate for foam monitors	-	-		30 3)
Portable foam generator	-	1		1
Supply of foam concentrate for portable foam generator	-	30 [3]		30 [3]
Water-spray system	1	– [4]		– [4]
No. of hose connection each· side of ship	4	8		8
Fireman's outfits	4	8		8
Fuel supply [h] [5]	24	96		96

[1] Horizontal distance from monitor orifice to centre of impact area.
[2] Vertical distance from surface of water to centre of impact area at a distance of at least 70 m from the closest portion of the hip.
[3] Duration (in minutes) of uninterrupted from production with generator operating at rated output.
[4] A water-spray is to be installed in the case of the combined notation to system the character of classification **FF1/2** or **FF1/3**.
[5] With all monitors in uninterrupted operation.

B. Water - Spray System

1. The water-spray system is to be capable of protecting all the vertical external surfaces of the ship's hull exposed in the light-load condition, all the vertical surfaces of superstructures and deckhouses, the mounting platforms of the monitors and the deck areas above engine rooms and spaces in which combustible materials are stored.

2. The capacity of the water-spray system is to be calculated on the basis of 10 l/min^2 per m^2 of area to be protected.

3. A reduction of the capacity to 5 l/min^2 per m^2 may be approved for areas with A-60 type insulation applied from the inside.

4. The water-spray system is to be divided in such a way that sections of piping for areas of the ship which are not exposed to radiant heat can be shut off.

5. The nozzles are to be so arranged that the water is distributed evenly over the area to be protected. Provision is to be made to ensure adequate visibility from the bridge and the remote-control station for the monitors.

6. One of the pumps provided to supply water to the monitors may be used to operate the water-spray system provided that the capacity of the pumps is increased by the amount of the additional demand.

7. If, besides the ship's emergency fire pump, two further fire pumps are available for the ship's own use, one of these may be used for the water-spray system provided that their capacity is sufficient to supply water at the required pressure simultaneously to the water-spray system and the hose connections.

8. The pipes of the permanently installed water-spray system are to be hot-dip galvanized internally and externally or are to be given other equivalent anti-corrosion protection.

C. Water Monitor System

1. Design and siting of water monitors

1.1 Monitors must be approved by Biro Klasifikasi Indonesia.

1.2 Monitors must deliver a concentrated jet of water when operating at the required output.

1.3 At least two of the monitors are to be equipped with permanently fitted control enabling either a solid or a spray jet to be delivered as required.

1.4 When mounting the monitors, allowance is to be made for the loads due to recoil action and the state of the sea.

1.5 Monitors are to be made of materials resistant to seawater.

1.6 Monitors must be directed either fore or aft and must be capable of being traversed horizontally through an angle 45° with respect to each side of the ship. The angle of elevation is determined by the required height of throw. Within the required fields of traverse and elevation, the jet of water delivered by the monitors shall not be obstructed by superstructures, masts, funnels, etc.

2. Control of Monitors

2.1 A remote control is to be provided for the operation of monitors and valves.

2.2 The monitors and valves must be remotely controlled from a protected room (monitor control room) giving a full view of the rescue and/or firefighting operations.

2.3 In addition to the remote control, provision is to be made for the manual operation of the monitors and associated valves. The switch-over to manual operation is to be affected locally at the monitors and valves. Switch-over to remote control must be affected from the monitor control room.

2.4 Suitable measures such as appropriate settings of the opening and closing times of re-motely controlled valves are to be used to prevent unacceptable high-pressure surges in the system.

2.5 In electrical control systems an independent circuit is to be provided for each individual control unit. Hydraulic or pneumatic control systems must be capable of being supplied from two mutually independent energy sources.

D. Foam Monitor System

1. Capacity

1.1 Foam monitors must be approved by Biro Klasifikasi Indonesia.

1.2 The capacity of permanently installed foam monitors must be at least 5000 l/min of foam-water mixture each.

1.3 With both monitors operating simultaneously the length of throw must be at least 70 m.

1.4 The monitors shall be mounted at a level designed to achieve a maximum height of throw.

2. Foam Concentrate

2.1 The low-expansion foam concentrate must be approved for oil and chemical fires.

3. Foam Generator

3.1 The foam generating plant including the associated pipework must be permanently in-stalled.

E. Pumps, Sea Connections and Pipeline

1. Pumps

1.1 The pumps supplying water to the firefighting and water-spray systems together with their drive motors are to be installed in such a way that their operation and accessibility are not impaired by fumes or radiant heat during firefighting.

2. Sea Connections and Sea Chests

2.1 Sea connections and sea chests are to be provided on both sides of the ship for supplying the firefighting systems.

2.2 Facilities shall be available enabling such a connection to be used on either side of the ship.

2.3 Sea chest openings in the shell plating are to be equipped with strum plates having a free section equal to at least twice the free section of the seawater intake pipe.

2.4 Sea connections and sea chests are to be dimensioned and arranged so as to provide an adequate and uniform supply of water free from interference by movements of the ship or currents set up by thrusters and propellers. The supply of water to cooling water and other systems shall not be affected by firefighting operations.

2.5 Each sea connection is to be fitted with a shut off valve operated from the monitor control rooms.

3. Pipelines

3.1 The piping systems is to be dimensioned and laid out in such a way that all the monitors can be operated simultaneously at their rated capacity from one of the sea chests.

3.2 Up to the connection of the monitors, all pipelines are to be hot-dip galvanized internally or are to be given equivalent anti-corrosion protection.

F. Portable Fire Extinguishing Equipment

1. Hose Connections and Hose Stations

1.1 At least half the hose connections prescribed in these regulations are to be located on the open deck.

1.2 Hose stations are to be provided for at least every second hose connection.

1.3 Each hose station is to be equipped with two approved fire hose's, each 20 m one approved multi-purpose nozzle and one hose wrench.

1.4 It is to be ensured that at least half the hose connections can be operated simultaneously with a pressure of 5bar at the nozzle orifice.

1.5 Where water is supplied to the hose connections by the pumps of the water monitors, a separate piping system is to be provided for this purpose. Where necessary, the pressure is to be reduced, e.g. by pressure-reducing valves, to the point where the nozzles can be managed by one person each.

2. Portable Foam Generators

2.1 The portable foam generator called for in Table 1 is to be designed to produce at least 100 m^3 of high-expansion foam per minute.

2.2 The high-expansion foam extract must be approved for oil and chemical fires. It is to be stored in a readily accessible place in portable containers holding approximately 20 l each.

G. Fire-Fighter's Outfit

1. Range of Fire-Fighter's Outfit Required

1.1 Fire-fighter's outfit must conform to FSS Code .

1.2 Ship shall carry at least two fire-fighter's outfits.

1.3 The only respirator supplied shall be self-contained compressed-air breathing apparatuses. 1200 l of breathing air (including the spare cylinders) are to be provided for each breathing apparatus.

1.5 Two spare charges shall be provided for each required breathing apparatus. Passenger ships carrying not more than 36 passengers and cargo ships that are equipped with suitably located means for fully recharging the air cylinders free from contamination need carry only one spare charge for each required apparatus. In passenger ships carrying more than 36 passengers, at least two spare charges for each breathing apparatus shall be provided.

2. Storage of Fire-fighter's Outfits

2.1 The firefighter's outfit or sets of personal equipment shall be kept ready for use in an easily accessible location that is permanently and clearly marked and where more than one fire fighter's outfit or more than one set of personal equipment is carried, they shall be stored in widely separated positions.

2.2 The room must be so arranged that the items of equipment can be stored in an orderly manner ready for immediate use. Adequate ventilation and heating is required.

3. Compressor for Refilling of Breathing Air Cylinders

3.1 A breathing air compressor with a capacity of at least 300 l/min and with all the accessories necessary for filling simultaneously at least 4 breathing air cylinders is to be installed at a suitable position on the ship.

3.2 Breathing air compressors must be approved by Biro Klasifikasi Indonesia.

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