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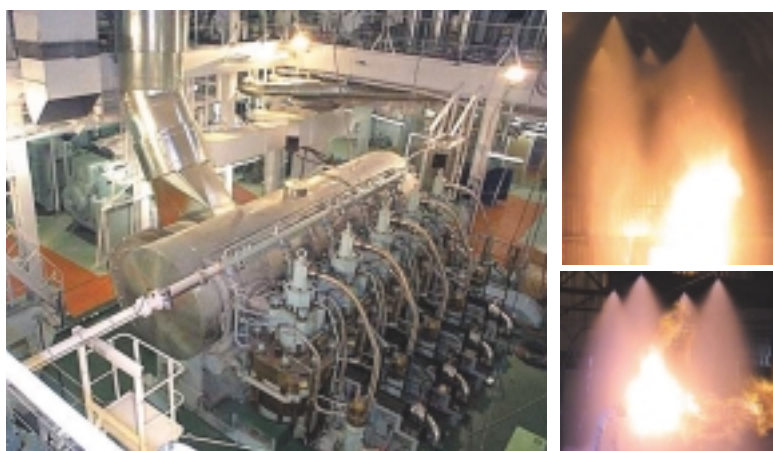
# TECHNICAL PAPER

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## LOCAL APPLICATION FIRE FIGHTING SYSTEMS DNV INTERPRETATIONS AND ADVICE FOR OWNER'S SPECIFICATION

PAPER SERIES NO. 2001-P013

*Revision 01*  
*December 2001*



DET NORSKE VERITAS

## **1 INTRODUCTION**

New requirements regarding local application fire fighting systems have been introduced by IMO through SOLAS Ch. II-2, Reg.7.7 and IMO MSC/Circ. 913. The requirements apply to new cargo and passenger vessels built after July 2002, whereas existing passenger vessels are to comply by October 2005. The Norwegian and Swedish Maritime Authorities have moved the target dates to 2000 and 2001, respectively.

To meet the excessive request on this subject, DNV has developed preliminary guidelines / interpretations to SOLAS Ch. II-2, Reg.7.7 and IMO MSC/Circ. 913. Any official IMO or IACS interpretations will automatically supersede these guidelines.

Details of the fire tests or component tests have not been addressed.

Validity of this revision: July 2002

## **2 DNV ADVICE ON OWNER SPECIFICATION**

As system approval is based upon comprehensive fire and component testing we recommend that only DNV type approved systems are specified as acceptable systems. Several systems are type approved, see part 4 of this paper for more information.

SOLAS Ch. II-2, Reg.7.7 and IMO MSC/Circ. 913 do not require system to be powered by emergency power. In case of a fire, the crew may have to choose between shutoff of affected engine and shutoff of pumps serving local system. No or delayed shutoff of engines can escalate fire significantly, so will also lack of release of local system. If pumps for local system are connected to the emergency power or independent of an external power supply, the crew can stop fuel supply to the area in fire and still release the local fire fighting system. Power demand for local system is typically 5–40 kW.

### 3 INTERPRETATIONS

#### 3.1 Definitions

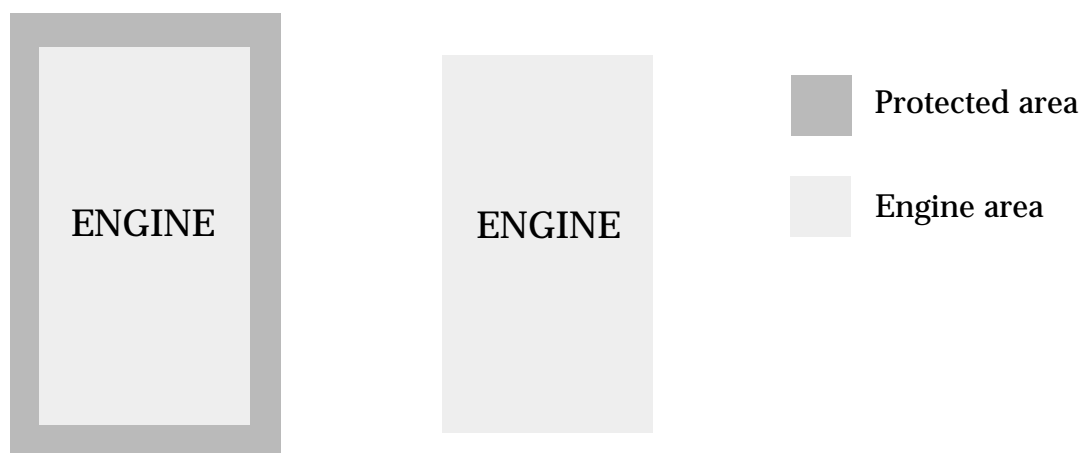
Protected object:

see SOLAS Ch. II-2, Reg.7.7 and below clarification.

Protected area (see also figure):

- i. section covering protected object(s), or
- ii. section covering protected object(s) and a zone outside these objects (1/4 nozzle spacing), see IMO MSC/Circ. 913,

Which option to be used is defined in the DNV type approval certificate.



Case 1: IMO MSC/Circ. 913, appendix 3.4.2.1  
↔ 1/4 nozzle spacing between first nozzle row and engine  
Protected area > engine area

Case 2: IMO MSC/Circ. 913, appendix 3.4.2.2  
First nozzle row can be located along periphery of engine.  
Protected area = engine area

*Protected space:*

space within A-class boundaries enclosing the protected area(s) in question

#### 3.2 Clarification on Objects to be Protected

All protected objects within a protected space need not to be covered simultaneously. However, simultaneously operation of sections is normally required when the protected areas are less than 2.0-2.5 m apart (final arrangement to be considered on a case by case basis).

Only top of engines (cylinder hood, fuel oil lines) need to be protected, unless combination of hot surface / oil lines are installed at lower level as well.

*Boiler fronts:*

Only oil burners on boilers is to be protected

*Fire hazard portion of incinerator:*

Only oil burners on incinerator is to be protected

*Gas turbines are to be protected*

*Inert gas generators, steam turbine and engines:*

SOLAS Ch. II-2, Reg.7.7.3 is not considered to apply to inert gas generators using oil burners (to be accepted by Flag State), steam turbines or steam engines.

**3.3 Large engines (width and height exceeding nozzle spacing)**

Installations where installed height exceeds tested height with less than 10 %, the following approach may be accepted (to be accepted by Flag State):

- Nozzles should be installed around the perimeter with spacing (far) less than the maximum spacing, and
- Additional nozzles should be located above the engine (for instance above exhaust manifold facing engine top). These nozzles should not be in conflict with IMO MSC/Circ. 913, annex 3.19. Alternatively, we may review a design where additional nozzles are located in a deckhead height exceeding the maximum approved height, provided that spacing of nozzles is reduced accordingly.

**3.4 Alarms (new SOLAS Ch.II-2, Reg.7.7.5)**

Indication on the bridge may be provided by using a dedicated reporting address in the fire detection and alarm system

The alarm inside the protected space should have a different characteristic from the fire alarm system defined by SOLAS Ch. II-2, Reg.13. See IMO Code on Alarms.

**3.5 Location of Equipment**

We generally advise that valves and pump units are located outside the protected space. The following alternatives can however be accepted on a case by case basis.

Section valves may be located inside the protected space if they are in compliance with IMO MSC/Circ. 913, annex 3.6/3.13 (fire resistant cables and pipes, valves, etc). Test documentation to be submitted.

Pumps may be located inside the protected space if it can be documented that the pump is in compliance with IMO MSC/Circ. 913, annex 3.6 or when a ventilated A-60 box enclosure is provided.

The release station(s) inside the protected space should be located along normal access ways or escape routes. Cables from the release station need not be of fire resistance type. Other items of the local fire fighting system should however not be affected if the fire damages this cable.

The release station(s) outside of the protected space shall be located on the other side of an A-class division.

### **3.6 Detection and Automatic Release**

Automatic release is only required for unmanned engine rooms. This relates to manning requirements from Flag States and not necessarily to additional class notation **E0**.

A combination of dedicated flame (located at end of object), heat or smoke detectors (located immediately above the protected object) is advised. Main alarm panel (as required by SOLAS Ch. II-2, Reg.13) may be used for routing signal from detectors to release logic unit.

The first detection signals should be used for release control (release upon signal from 2 out of 3 detectors is advised, release upon 2 out of 2 also accepted, whereas 1 out of 1 is not accepted). Subsequent signals should be disregarded, and it should though be possible to release or close sections manually (override the automatic release). Singles from detectors located in between sections should not be used for release purposes.

### **3.7 Miscellaneous – System Design Detection and Release**

Automatic stop of ventilation fans (IMO MSC/Circ. 913, annex 3.4) upon release of system is not required when fire performance test is carried out according to IMO MSC/Circ. 913, appendix 3.2.1.1.

Compliance with IMO MSC/Circ. 913, annex 3.2 can be documented by a full scale test on a "typical" marine diesel engine. Engine should operate for 20 minutes under full discharge rate from the local system.

### **3.8 Component Test**

The following component test is to be carried out (reference is made to IMO Circ. 668/728, appendix A):

- 4.1 General (test conditions)
- 4.2 Visual examination
- 4.5 Functional test
- 4.10 Water flow
- 4.11 *Water distribution*

- 4.12 Corrosion tests
- 4.13 Nozzle coatings (if applicable)
- 4.14 Heat resistance
- 4.16 *Vibration tests*
- 4.17 Impact test
- 4.21 Clogging test
- 5.1 General (marking of nozzles)

Exemption from the items written in Italics can be granted when supported by adequate documentation.

## **4 DNV TYPE APPROVAL CERTIFICATES**

1. Open internet site: [www.dnv.com](http://www.dnv.com)
2. Click on flip-over "Products & Services"
3. Choose under classification "Approved Products"

Water mist systems certificates can be found under these categories:

Equivalent Sprinkler System (IMO Res. A.800 (19))  
Fixed Local Application Water Based Systems (SOLAS Ch. II-2, Reg.7.7)  
Waterbased Fixed Fire Fighting System (IMO Circ. 668/728)

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