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THÔNG BÁO KỸ THUẬT TÀU BIỂN
TECHNICAL INFORMATION ON SEA-GOING SHIPS

Ngày 11 tháng 07 năm 2012
Số thông báo: 021TI/12TB

Nội dung: Chiến dịch kiểm tra tập trung của các Chính quyền cảng thành viên Indian Ocean MOU về bố trí các hệ thống an toàn chống cháy từ ngày 01 tháng 09 đến ngày 30 tháng 11 năm 2012.

Kính gửi: Các chủ tàu/ công ty quản lý tàu
Các đơn vị đăng kiểm tàu biển

Ngày 07 tháng 06 năm 2012, Ban Thư ký Tổ chức Indian Ocean MOU đã ra thông cáo báo chí về việc các Chính quyền cảng thành viên Tổ chức này sẽ tiến hành chiến dịch kiểm tra tập trung về bố trí các hệ thống an toàn chống cháy từ ngày 01 tháng 09 đến ngày 30 tháng 11 năm 2012. Như vậy, Indian Ocean MOU sẽ tiến hành đồng thời chiến dịch kiểm tra này cùng với các thành viên của Paris MOU và Tokyo MOU (đề nghị xem Thông báo kỹ thuật tàu biển số 020TI/12TB ngày 02 tháng 06 năm 2012 trong mục: *Thông báo của VR/ Thông báo kỹ thuật TB* của trang tin điện tử Cục Đăng kiểm Việt Nam: http://www.vr.org.vn).

Chúng tôi xin gửi đến các Quý Đơn vị, kèm theo Thông báo kỹ thuật này, thông cáo báo chí ngày 07 tháng 06 năm 2012 của Indian Ocean MOU và hướng dẫn liên quan. Đề nghị các Quý Đơn vị lưu ý và có sự chuẩn bị sẵn sàng, nhằm tránh việc tàu bị lưu giữ trong chiến dịch kiểm tra tập trung nêu trên của các Chính quyền cảng thành viên Paris MOU, Tokyo MOU và Indian Ocean MOU

Thông báo kỹ thuật này được nêu trong mục: *Thông báo của VR/ Thông báo kỹ thuật TB* của trang tin điện tử Cục Đăng kiểm Việt Nam: http://www.vr.org.vn.

Nếu Quý cơ quan cần thêm thông tin về vấn đề nêu trên, đề nghị vui lòng liên hệ:

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Xin gửi đến các Quý Cơ quan lời chào trân trọng./.

KT. CỤC TRƯỞNG
PHÓ CỤC TRƯỞNG

Nơi nhận:
- Như trên;
- Phòng QP, TB, CN, CTB;
- Trung tâm VRQC, TH;
- Lưu TB./.

Nguyễn Vũ Hải

PRESS RELEASE

INDIAN OCEAN MOU WILL CARRY OUT A CONCENTRATED INSPECTION CAMPAIGN (CIC) ON FIRE SAFETY SYSTEM ARRANGEMENTS FROM SEPTEMBER 1st, 2012

The member Authorities of the IOMOU will embark on a concentrated inspection campaign (CIC) on Fire Safety System Arrangements. The three- month campaign will start on September 1, 2012 and end on November 30, 2012

During the campaign period, member Authorities of the IOMOU will inspect, within the resources available, as many ships as possible in conjunction with routine port State control inspections. The purpose of the campaign on Fire Safety System is to get a detailed view of the fire safety arrangements, maintenance records and other applicable documentation will be verified in more detail for compliance with SOLAS Chapter II-2. Port State Control Officers (PSCOs) will use a list to verify critical areas for the shipboard fire safety systems, some of which are related to documentation, equipment and crew familiarisation.

For this purpose, PSCOs will apply a questionnaire listing a number of items to be covered during the concentrated inspection. The questionnaire has been annexed to this press release.

All deficiencies found, will be recorded by the port State. Action taken may vary from instructing the master to rectify before departure or within a certain period, to detention of the ship until serious deficiencies have been rectified.

07 June 2012

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MEMORANDUM OF UNDERSTANDING ON PORT STATE CONTROL IN THE INDIAN OCEAN REGION

CONCENTRATED INSPECTION CAMPAIGN ON Fire Safety Systems(FSS) 01/09/2012 to 30/11/2012

CIC ON FIRE SAFETY SYSTEMS (FSS).

Inspection Authority			
Ship Name		Flag	
IMO No.		Classification Society	
Date of Inspection		Inspection Port	

No.	Item	Yes	No	N/A
1	Does the Fire Control Plan meet the requirements?	☐	☐	
2a	Do the fire fighters' outfits including personal equipment comply with the requirements?	☐	☐	☐
2b	Do the Emergency Escape Breathing Devices (EEBD) comply with the requirements?	☐	☐	☐
3	Are the portable extinguishers ready for use in locations as per the fire plan?	☐	☐	☐
***4**	Does the test of automatic audible alarm sound prior to release of a fixed gas fire-extinguishing medium into spaces in which personnel normally work?	☐	☐	☐
***5a**	Are the fire protection systems, fire fighting-systems and appliances maintained ready for use?	☐	☐	
5b	Is there a maintenance plan onboard to show that fire protection systems and fire- fighting systems and appliances (as appropriate) have been properly tested and inspected?	☐	☐	
***6**	Is the crew familiar with the location and operation of fire-fighting systems and appliances that they may be called upon to use?	☐	☐	
7	Does the test of the sprinkler system trigger an automatic visual and audible alarm for the section?	☐	☐	☐
***8**	Does the activation of any detector or manually operated call point initiate a visual and audible fire signal at the control panel on the bridge or control station?	☐	☐	☐
9	Is the lighting in escape routes, including the Low Location Lighting systems where applicable properly maintained?	☐	☐	☐

***10**	Is the Emergency Fire pump, capable of producing at least two jets of water?	☐	☐	☐
11	Are the Isolating valves of the fire main marked, maintained and easily operable?	☐	☐	☐
***12**	Where a fire drill was witnessed was it found to be satisfactory?	☐	☐	☐

13	Was the ship detained as a result of the CIC?	☐	☐	

Notes: If the box “No” is ticked off, for questions marked with an “*” the ship may be considered for detention. The detail of any
deficiencies should be appropriately entered on the PSC Report of Inspection -Form B and include the deficiency code as indicated in the question.

For questions combined with the conjunction “and” if the box “YES” is checked that means all the parts in the question are in compliance.

Guidelines on the Concentrated Inspection Campaign (CIC) on Fire Safety Systems (FSS)

Introduction:

The deficiencies related to fire safety account, on an average in the last 8 years, account for 14% of the total number of deficiencies within the Paris and Tokyo MOU. A CIC on FSS on any types of ships has never been the subject of a CIC in the past. Compliance of ships with provisions of the International Convention on Safety of Life at Sea Ch II-2 has never been assessed by any CIC. Taking all the above into consideration, at the 20th session of the Tokyo MOU Committee meeting (PSCC20), it was agreed to organize a joint CIC between the Paris and Tokyo MoU's in 2012 to verify the compliance with the Fire Safety Systems requirements and the provisions of the International Convention SOLAS Ch II-2 on all types of ships. Considering the importance of Co-operation and Harmonisation, IOMOU Committee during its 14th Meeting, decided to participate in this CIC.

The guidelines (Items to check) are a tool for the Port State Control Officer to be familiar with the requirements of the Convention. It is not intended nor expected that the PSCO will be using the guidelines as a check list, PSCOs will use their professional judgment to the extent of using the guidelines and the items to check pertaining to each question.

General:

The campaign will target aspects of compliance provisions of SOLAS Chapter II-2 on all vessels regardless of type. The campaign is designed to examine a specific area and not intended to detract from normal coverage of Port State Control Inspections. The CIC will be conducted in conjunction with the regular port State control targeting,

In principle PSC inspection performed during the campaign is subject to **one** CIC only.

Purpose:

To get a detailed insight of the compliance of the relevant regulations as applicable.
The revised Chapter II-2: Construction – Fire protection, fire detection and fire extinction, of the Annex to the International Convention for the Safety of Life at Sea (SOLAS) came into force on 1 July 2002. This chapter applies to all ships, irrespective of type, constructed before, on or after this date. Existing ships shall comply with the requirements of the Convention and regulations as appropriate.

It is the responsibility of the Flag administration to ensure existing ships comply with the requirements of Ch II-2 as amended.

Objective:

This CIC is to ensure that:

- There is compliance with the requirements of the SOLAS convention as applicable.
- The firefighting equipment is readily available and maintained at all times.
- The master, officers and crew are familiar with equipment and have received training in carrying out their duties and
- To raise awareness among the crew on fire safety related issues.

The following guidance is provided to assist in checking for compliance of SOLAS Ch II-2 and the FSS Code, during the CIC. In addition PSCOs should refer to the following documents:

SOLAS 74	Safety of Life at Sea Ch II-2
STCW	Standards of Training Certification and Watchkeeping for Seafarers Regulation 1/4 & Regulation 1/14
PSCC 43/2010/24	Conducting Operational Fire, Abandon Ship and Damage Control Drills during a Port State Control Inspection, **(this is a Paris MOU Instruction).**

References For information purposes only:

The following Resolutions and Circulars are for information purposes only and as such are generally regarded as editorial guidance to flag states and **should not be construed as regulations** to be applied by PSCOs

Resolution A.951(23): Improved guidelines for marine, portable fire extinguishers.
Resolution A.752(18): Guidelines for the evaluation, testing and application of low-location lighting on passenger ships.
Resolution MSC.265(84): Amendments to Resolution A.800(19). The revised Guidelines for Approval of Sprinkler Systems Equivalent to that referred to in SOLAS regulation II-2/12.
MSC/Circ.849: Guidelines for the performance, location, use and care of emergency escape breathing devices (EEBDs).
MSC/Circ.850: Guidelines for the maintenance and inspection of fire-protection systems and appliances.
Resolution A. 1021(26): IMO Code on Alerts and Indicators 2009.
MSC.1/Circ.1275: Unified interpretation of SOLAS Chapter II-2 on the number and arrangement of portable fire extinguishers onboard ships.
MSC.1/Circ.1318: Guidelines for the maintenance and inspections of fixed CO2 fire-extinguishing systems.

In arriving at a Yes or No answer to each of the questions the following needs to be considered:

- **Should a question be answered "NO" a deficiency using the appropriate deficiency code listed in the question shall be used on the report of inspection form "B" and**
- **Should a question marked with an asterisk be answered "NO" the ship may be considered liable for detention.**

Examination of certificates and documents:
For the purpose of the CIC, at the initial inspection the Port State Control Officer will, as a minimum check the following to the extent applicable:

- Cargo ship safety equipment certificate.
- Passenger ship safety certificate
- Cargo ship safety certificate
- Fire control plan
- Fire safety operational booklet
- Ship's log book with respect to records of drills, records of inspection and maintenance of fire fighting appliances.
- Service or maintenance certificates for firefighting appliances, and any other certificates as appropriate.

However, no deficiency should be noted if the certificate for the hydraulic test of extinguishers and CO2 bottles is not available on board.

Due to re numbering of the regulations in SOLAS (consolidated 2009); the convention references/ deficiencies codes may be different depending on the keel laid date of the ship. PSCO's are requested to use the tools available at their disposal to check for the accurate convention references/ deficiencies codes. PSCO's should use the correct reference when noting deficiency on ships built before 1-7-2002. Every effort should be made to use deficiency code given in the questionnaire.

Explanatory notes to the CIC questions

1. Does the Fire Control Plan comply with the requirements?
SOLAS Ch II-2 Reg 15.2.4 and Reg 15.3.2 (Def Code 01309)

Items to Check:

- Is the plan permanently displayed in a prominent position?
- Does the plan appear to be up-to-date and any alterations recorded?
- Is there a duplicate plan available outside the accommodation for the use of shore firefighting personnel?
- Are relevant ships personnel familiar with the plan and its contents?
- If fire safety operational booklets have been issued in lieu of a plan, has every individual officer been issued with a set and are they familiar with the contents.
- If there is a separate booklet, is it available in an accessible location?

Requirements:
Fire control plans should be permanently displayed and provide up to date information on fire fighting equipment on board a ship. Any alterations should be recorded. Alternatively, at the discretion of the Administration, 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 practicable. The plans and booklets should be at least in English or French.

Additionally for passenger ships carrying more than 36 passengers the keel laying date and applicable SOLAS conventions and amendments should be recorded. The plan should indicate dates and description of any modifications to the ship, which in any way alter its fire safety (Ch II-2/ R15.3.2).

A duplicate set of fire plans or a booklet should be ready available outside the accommodation and permanently stored in a prominently marked weathertight enclosure for the assistance of shore-side fire-fighting personnel, usually placed adjacent to the gangway.(Ch II-2/R 15.2.4)

Fire control plans do not require to be stamped approved.

Fire control 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
- particulars of the fire detection and fire alarm systems,
- the sprinkler installation,
- the fire-extinguishing appliances,
- means of access to different compartments, decks, etc.,
- 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 Administration, 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 practicable.

2a. ***Do the Fire-Fighter's Outfits including personal equipment comply with the requirements?***
SOLAS Ch II-2 Reg 10.10; Reg 14.2.2 (Def Code 07111)

<u>Items to Check</u>:

- Are the Fire-Fighter's Outfits correctly stowed ready for use?
- Check the condition of the equipment and the correct operation of a representative sample of the BA sets.
- Is the correct pressure showing on the gauge?
- Does the low-pressure warning device operate? Ask a crewmember to demonstrate. Whistle should sound.
- Check the pressure gauge on the cylinder for the correct pressure (Normally stamped on the cylinder).
- Request to check maintenance plan.
- If ship is fitted with a suitable compressor for recharging the bottles check for test carried out annually and maintenance plan for the air compressor.

<u>Requirements</u>:

A Fire Fighters Outfit consists of a set of:

i) personal equipment
ii) a breathing apparatus and
iii) a life line.

*The personal equipment consists of**:***

1. protective clothing of material to protect the skin from the heat radiating from the fire and from burns and scalding by steam. The outer surface shall be water-resistant;
2. boots of rubber or other electrically non-conducting material;
3. rigid helmet providing effective protection against impact;
4. electric safety lamp (hand lantern) of an approved type with a minimum burning period of 3 hours. (electric safety lamps on tankers and those intended to be used in hazardous areas shall be of an explosion-proof type); and
5. axe with a handle provided with high-voltage insulation

The Breathing Apparatus comprises:

1. a self-contained compressed air-operated breathing apparatus for which the volume of air contained in the cylinders shall be at least 1,200 litres, or other self-contained breathing apparatus which shall be capable of functioning for at least 30 min. All air cylinders for breathing apparatus shall be interchangeable.
2. Two spare air cylinders must be provided for each set of breathing apparatus, however for passenger ships carrying not more than 36 passengers and cargo ships (S74 Ch II-2/R10.10.2.5), if there is a means of recharging the cylinders on board with a suitable compressor, only one spare cylinder per set need be provided.

Specification of a Lifeline

- For ships built from 25 May1980 to 01 July 2002 a fireproof lifeline of sufficient length and strength shall be provided capable of being attached by means of a snap-hook to the harness of the apparatus or to a separate belt in order to prevent the breathing apparatus becoming detached when the lifeline is operated.
- For ships built on or after 1 July 2002 for each breathing apparatus a fireproof lifeline of at least 30 metres in length shall be provided. The lifeline shall successfully pass an approval test of a statical load of 3.5 kN for 5 minutes without failure. The lifeline shall be capable of being attached by means of a snap-hook to the harness of the apparatus or to a separate belt in order to prevent the breathing apparatus becoming detached when the lifeline is operated.

At least two self-contained BA sets additional to those required by regulation 10.10 shall be provided on cargo ships carrying dangerous goods.(Ch II-2 R19.3.6.2)

In passenger ships carrying more than 36 passengers, at least two spare cylinders per set must be provided.

Passenger ships carrying more than 36 passengers shall be fitted with a suitably located means for fully recharging breathing air cylinders, free from contamination (passenger ships built after 1 July 2010).

Every ship shall carry at least 2 Fire Fighters Outfits; however for tankers 2 additional sets must be carried. For passenger ships the number of sets is determined by the length of the passenger and service spaces and for passenger ships carrying more than 36 passengers 2 additional outfits must be provided for each main vertical fire zone. Also for passenger ships carrying more than 36 passengers for each pair of breathing apparatus a water fog applicator must be provided and stored adjacent to the breathing apparatus.

The equipment should be maintained in a state of operational readiness and should be tested and inspected according to a planned maintenance system.

For ships built on or after 1 July 2002 there were additional requirements:

- The specification for the Fire Fighters Outfit was defined in the FSS Code
- Name changed from Fireman's Outfit to Fire-Fighter's Outfit
- The safety lamp needed to be of an explosion proof type for tankers
- The axe handle must be provided with high voltage insulation
- The lifeline length (30 m) and breaking strain (3.5 kN for 5 minutes) were defined
- The smoke helmet type of breathing apparatus with an air pump was no longer allowed.

Storage of fire-fighter's outfits
The fire-fighter's outfits 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.

In passenger ships, at least two fire-fighter's outfits and, in addition, one set of personal equipment shall be available at any one position. At least two fire-fighter's outfits shall be stored in each main vertical zone.

2b. ***Do the Emergency Escape Breathing Devices (EEBD) comply with the requirements? SOLAS Ch II-2 Reg 13.3.4; 13.4.3 (Def Code - 07112) Retrospective for ALL SHIPS***

Items to check**:**

- Check that the EEBDs are located in positions as indicated on the fire control plan and ready for immediate use.
- Check that the user instructions or diagrams are printed on the EEBD
- Check the correct pressure in the cylinders. (Pressure normally stamped on the cylinder)
- Check the maintenance plan.

Requirements:

The requirement for EEBDs came from the SOLAS 99/00 Amendments and is retrospective for all ships.

The specification for an EEBDs is in the FSS Code Chapter 3 Paragraph 2.2.

EEBDs are required in both the accommodation and machinery spaces.

The minimum number of EEBDs to be kept within accommodation spaces should be as follows:

1. for cargo ships: two (2) EEBDs;
2. for passenger ships carrying not more than 36 passengers: two (2) EEBDs for each main vertical zone, except those defined in the regulation 13.3.4.5, and
3. for passenger ships carrying more than 36 passengers: four (4) EEBDs for each main vertical zone, except those defined in the regulation 13.3.4.5,

In machinery spaces for category A containing internal combustion machinery used for main propulsion, EEBDs are considered to be positioned as follows:

1. one (1) EEBD in the engine control room, if located within the machinery space;
2. one (1) EEBD in workshop areas. If there is, however, a direct access to an escape way from the workshop, an EEBD is not required; and
3. one (1) EEBD on each deck or platform level near the escape ladder constituting the second means of escape from the machinery space (the other means being an enclosed escape trunk or watertight door at the lower level of the space).

Alternatively, different number or location may be determined by the Administration taking into consideration the layout and dimensions or the normal manning of the space.

For machinery spaces of Category A other than those containing internal combustion machinery used for main propulsion, one (1) EEBD should, as a minimum, be provided on each deck or platform level near the escape ladder constituting the second means of escape from the space (the other means being an enclosed escape trunk or watertight door at the lower level of the space).

For other machinery spaces, the number and location of EEBDs are to be determined by the Adminis tration.

Spare EEBDs shall be kept onboard. The number and location of the EEBDs should be shown on the Fire Control Plan as required in Ch II-2/R15.2.4

The EEBDs should be maintained in a state of operational readiness and should be tested and inspected according to a planned maintenance system.

3. ***Are the portable extinguishers ready for use in location as per the fire plan?***
SOLAS Ch II-2 Reg 10.3.2.4 (Def Code 07110) Retrospective for ALL Ships

<u>Items to check</u>:

Portable fire fighting equipment must be maintained in good order and be kept available for immediate use at all times.

- Check that portable extinguishers are in place and ready for use by releasing the extinguisher from the cradle without use of any tools or similar equipment and ensure the extinguisher has not been permanently attached.
- Check type and quantity of extinguishing medium.
- Check that each extinguisher has been subjected to periodical inspections in accordance with the manufacturer's instruction and serviced at intervals not exceeding one year.
- Check for inspection plans. The records should show the date of inspection, the type of
- maintenance carried out and whether or not a pressure test was performed.
- Check that portable extinguishers are placed in easily visibly places and be identified on a tour around the ship.
- It is important that all fire fighting equipment must be maintained in good order and be kept available for immediate use at all times. (MSC.1/Circ1275)

Requirements:

SOLAS chapter II-2/Regulation 10.3.2(ships constructed on or after 1st July 2002). Regulation 6

(ships constructed on or after 1st September 1984) require that accommodation spaces, service spaces and control stations are provided with portable fire extinguishers of appropriate types and in sufficient number to the satisfaction of the Administration.

Ships of 1,000 GT and upwards shall carry at least five portable fire extinguishers. One of the portable fire extinguishers intended for use in any space shall be stowed near the entrance to that space.

In ships constructed on or after 1 July 2002, Carbon dioxide fire extinguishers shall not be placed in accomodation spaces. In control stations and other spaces containing electrical or electronic equipment or appliances necessary for the safety of the ship, fire extinguishers should be provided whose extinguishing medium are neither electrically conducive nor harmful to the equipment and appliances (Ch II-2 R 10.3.2.3)

Fire extinguishers must be reached quickly and easily at any time in the event of a fire, and in such a way that their serviceability is not impaired by the weather, vibration or other external factors. Portable fire extinguishers shall be provided with devices which indicate whether they have been used.
Arrangement of extinguishers as per SOLAS II-2 Reg 10.3 and MSC.1/Circ 1275 is more important/relevant

** PSCO should be aware that ships constructed before 1. September 1984 may have less stringent requirements*

4.** ***Does the test of automatic audible alarm sound prior to release of a fixed gas fire-extinguishing medium into spaces in which personnel normally work? SOLAS Ch II-2/ Reg 10.5. (Def Code 07109)

This question should be answered either yes, no or n/a. If the question is answered as 'no' then the PSCO should consider whether or not there is a serious risk to the safety of the crew, the ship and the marine environment and whether or not the deficiencies can or will be rectified before departure. A detention may be considered

Items to check:

- Check that instructions for operating the installation are displayed near the remote operating controls, distribution control valves and also near the gas cylinders.
- Check that a notice is displayed indicating that the system should not be used for inerting purposes unless the compartment is gas free since the injection of CO2 may generate a static charge capable of igniting flammable atmospheres when the installation is used to protect the pump room or cargo tanks of a tanker and similar spaces,
- Check that, when the means for putting the system into operation are located within a compartment which may be locked, e.g. the CO2 cylinder room, one key to such a compartment is provided adjacent to the entrance in a suitably marked glass-fronted box.
- Check that over ride facilities that can be rapidly operated without entry into the protected

space are provided to enable spaces to be ventilated after the injection of CO2.

- Check that suitable notices are posted by the ventilation system controls to indicate that provisions for automatic ventilation shut down have been fitted and where these are located.
- Check that notices are posted on the entrances to every space protected by CO2 indicating that the space is so protected and that personnel should evacuate the space immediately on hearing the CO2 alarm.
- The means provided for giving audible alarm referred to in the regulations should be distinct from other alarms and comply with Code on Alarms and Indicators, 1995 (IMO Resolution A.1021(26)). Check that there is visual indication in addition to the audible alarm in many situations, as per requirements in part 3.2 of the Code on Alarms and Indicators.
- Check that the alternate power supply to electrical alarms is obtained from the emergency source batteries or through the emergency switchboard.
- Check that supplies for air operated devices are taken from the main air receivers through a safeguarded supply system.
- The alarms, if electric, are to be intrinsically safe and if of the air operated type should be connected to a safeguarded moisture free supply, when such alarms are fitted in pump rooms.

Requirements:

By the first scheduled dry-docking after 1 January 2010, fixed carbon dioxide fire-extinguishing systems for the protection of machinery spaces and cargo pump-rooms on ships constructed before 1 July 2002 shall comply with the provisions of paragraph 2.2.2 of chapter 5 of the Fire Safety Systems Code.

- two separate controls shall be provided for releasing carbon dioxide into a protected space and to ensure the activation of the alarm. One control shall be used for opening the valve of the piping which conveys the gas into the protected space and a second control shall be used to discharge the gas from its storage containers. Positive means shall be provided so they can only be operated in that order; and
- the two controls shall be located insid a release box clearly identified for the particular space. If the box containing the controls is to be locked, a key to the box shall be in a break-glass-type enclosure conspicuously located adjacent to the box.

Effective safeguards should be provided against the gas being accidentally released when a CO2 system is being serviced on board and to guard against the inadvertent and, as far as practicable, the malicious use of the controls after the system has been installed or serviced. To achieve this, the discharge of CO2 from the storage cylinders should be isolated from the machinery space by means of a sector valve and preferably arranged that the control cabinet door cannot be closed unless the sector valve is in the fully closed position. In installations where the sector valves are gas operated equivalent means of safeguarding the system against inadvertent discharge should preferably be provided on the actuation position.

The release arrangements should give an indication if the system is being operated. Where automatic time delays are incorporated in any of the release arrangements for the system these should preferably have a means of bypassing the delay and be set to zero delay. Where any delay device is fitted this should be clearly marked on the operating instructions and include the time delay setting so that the operator can distinguish between intentional delay and malfunction of the system. Systems compromising automatic stopping of fans, closure of fire dampers or remote closing valves, which are activated by the release of the CO2 in the event of a fire should be supplemented with a manual override.

CO2 contents checking:
Means for checking the quantity of medium in containers should be so arranged that it is not necessary to move the containers completely from their fixing position. This is achieved, for instance, by providing hanging bars above each bottle row for a weighing device or by using suitable surface indicators.
(MSC.1/Circ1318)

Safety precautions:

CO2 as a fire fighting medium is potentially lethal. Inadvertent operation, leaking of installations and poor ventilation could jeopardize the safety of the PSCO, the crew and any other person working on board. The PSCO is therefore advised to access spaces with CO2 containers with the utmost care and precaution and to remain in control of any operation of the CO2 installation, by crewmembers executing any operation during his inspection. The PSCO should not assume that the crew is familiar with the operation and/or the risks of these installations.
In all cases, the PSCO should bear in mind that service companies are often not qualified or under time-pressure when servicing these complex installations. This has a detrimental effect on the quality and reliability of the work done.

Points of attention for the PSCO:
High pressure CO2 installations are often found to have defects in the following areas:

- Responsible crew is oblivious of the operation, risks and maintenance of the system
- No or poor ventilation of the storage room (should be running before entering)
- No eligible operating and maintenance instructions
- Switches for alarms and ventilation stops dismantled
- Bottles not properly secured in their brackets
- Operating wires entangled
- Operating levers disconnected from the bottles
- High pressure hoses in the system are loose due to vibration or incomplete maintenance
- Blind flanges in discharge mains not turned in correct position after drydocking
- Operating gas bottles missing
- Storage room used as general store
- Discharged bottles (heads have an oily shine and bottles sound different when hit)
- Discharge mains pressurized due to leakage (pressure indicated on gauge)
- Discharge piping wasted due to leakage of water through ventilation openings
- Levers missing on separation valves for directing the medium
- Seized separation valves
- Unauthorised repairs to the installation, in particular welding operations and piping.

Low pressure (single tank) CO2 installations are often found to have the following defects:

- Responsible crew is oblivious of the operation, risks and maintenance of the system
- No or poor ventilation of the storage room (should be running before entering)
- No eligible operating and maintenance instructions
- Switches for alarms and ventilation stops dismantled
- Cooling units not working (should be two pieces, both operational, fail safe installation)
- Cooling medium missing and not replenished
- Electrical installation for cooling units and alarm system tampered with
- Tank safety valve blown (oily shine on the valve, no level visible on the gauge)
- Tank isolation damaged extensively
- Unauthorized repairs to the installation, in particular welding operations and piping
- Discharge piping wasted due to leakage of water through ventilation openings
- Levers missing on separation valves for directing the medium
- Seized separation valves

5a.** ***Are the fire protection systems and fire fighting-systems and appliances maintained ready for use? SOLAS Ch II-2 R 14.2.1. (Def Code 07108)

This question should be answered either yes or no. There is no provision for this question to be answered 'not applicable' If the question is answered as 'no' then the PSCO should consider whether or not there is a serious risk to the safety of the crew, the ship and the marine environment and whether or not the deficiencies can or will be rectified before departure. A detention may be considered.

Items to check:

- Check that there is ready availability of water in the fire main system or starting of a fire pump from the bridge (SOLAS ch II-2/R 10.2.1.2).
- Check that the hoses and nozzles are in good condition, free of leaks and with effective shut off mechanism.
- Check that fire hydrants are capable of being shut off and that coupling match the hoses.
- Check that the fire pump produces enough pressure and quantity of water to supply two fire hoses, widely separated, and with an additional fire hydrant open to simulate a leak or pipe break. (S74 Ch II-2 Reg 10.2.2.4)
- Check portable extinguishers for condition and last service.
- Check that fixed pressure water spray or water mist systems have been kept at the required pressure and are ready for immediate use. The pressure drop at which the pumps start should be capable of being demonstrated by the ship's crew.
- Check ventilation arrangements, in particular local or remote closing devices such as fire dampers and the means for shutting down mechanical fans. Reference to the records will show when these were last tested.
- Check remote fuel shut offs and verify that 'quick closing devices' or remote operated fuel valves have been periodically tested. It should be possible to test the valves without"blacking" out and the crew should be capable of resetting the valves to open position after closure.Remote fuel shut off valves may be operated by wire, extended spindle, air, hydraulic or electric.
- Check that active fire protection systems such as fire detection and fire alarm systems designed to indicate the presence of fire and warn the ships staff.
- Check that fire detection systems, when required on board, are switched on and clear of any

fault indications or active alarms.

- Check that active alarms are, or have been, investigated by the officer on watch and appropriate action taken.
- Check that fire detectors are not isolated and often isolated alarms are show on the control unit display or else are indicated on the display by pressing the 'isolation' button or similar.
- A random tests of a fire detector may be carried out and the crew should be able to demonstrate this using suitable test equipment, as the self test function on most fire detection systems will not normally check the ability of a detector head to detect fire or smoke. For example an 'oily rag' or an 'open flame' should not be considered as suitable test equipment due to the fire risk hazard and the likelihood of damaging or contaminating the detectors.
- Check that the crew is capable of carrying out random tests of manual call points.
- Check that there are acceptable means of escape from a fire to a place of safety or refuge, this includes:
    - Escape routes, escape doors and hatches, ventilation or smoke extraction from Escape routes and stairways.
- Check that escape routes are clear of obstructions and illuminated by main and emergency lighting.
- Check that engine room escape trunks are fitted with a self closing fire door at the points of entry and are insulated either internally or externally.
- Internal insulation is often susceptible to damage. Internal insulation may also reduce the clear cross sectional area of the fire escape below the minimum allowed by regulation and this may be a cause for a more detailed inspection of the adequacy of the SFP and compliance with the regulations

Requirements:

SOLAS Ch II-2 Reg 14.2.1 refers to fire protection systems. These should be physically checked by the PSCO to verify that they have been inspected by the ships staff in accordance with either the manufacturers' instructions or a documented onboard maintenance plan. Well kept records of maintenance, inspection and testing will give an indication that the equipment is maintained'ready for use' in accordance with S74 Ch II-2 Reg 14 – Operational Readiness and Inspection.

Fire protection systems include passive fire protection systems such as structural fire protection (SFP) including A and B class divisions, fire doors, cable and pipe penetrations and cable and pipe insulation. Reference to the Fire Plan on board will show which bulkheads and decks are A or B Class but are not required to show the insulation value for example A-60. All A class divisions must be of steel or equivalent and capable of preventing the passage of smoke and flame to the end of the one hour test. Obviously holes in bulkheads and decks such as cable penetrations that are not closed off and fire doors that do not close tightly against the seals or have holes in them will not comply with this requirement. Where it is evident that a new cable or pipes have been installed a visual check should be made of the installation to ensure that the SFP requirements have been complied with.

PSCO should be vigilant for damaged SFP and fire doors that do not close, that are tied back or their self closing devices have been removed or disabled. Self-closing fire doors must not be fitted with holdback hooks unless they are subject to central control station release in the case of passenger ships and remote release arrangements with a fail-safe device in the case of cargo ships. Not all fire doors are required to be self-closing, however the plan must be consulted and may give an indication of the requirements as applicable.

Failure on the part of the crew to understand the importance of maintaining the integrity of the SFP might indicate a lack of training either on board or ashore. The training manual should contain details on the fire protection arrangements on board.

5b. Is there a maintenance plan onboard to show that fire protection systems and fire- fighting systems and appliances (as appropriate) have been properly tested and inspected? SOLAS Ch II-2R 14.2.2 (all ships). (Def Code 07124)

Items to check:

- Check that the maintenance plan is kept on board the ship and is available for inspection.
- A well produced maintenance plan will include a description of the checks to be carried out and the time intervals between checks.
- A visual inspection of the fire protection systems and fire fighting systems will normally provide the PSCO with sufficient objective evidence to show whether or not any records are accurate.
- Check that there are records on board to show that such systems and equipment been periodically checked by specialist staff have been carried out that are normally not undertaken by the ship staff such as;
    - Liquid level in the cylinders
    - Pressure testing of cylinders
    - Testing of the firing mechanism of the fixed fire fighting systems
    - Foam concentrate checks- especially on the deck foam systems on tankers.
- Check that the maintenance plan, which may be computer based, includes at least the following fire protection systems and fire-fighting systems and appliances, where installed:
    - fire mains, fire pumps and hydrants, including hoses, nozzles and international shore connections;
    - fixed fire detection and fire alarm systems;
    - fixed fire-extinguishing systems and other fire-extinguishing appliances;
    - automatic sprinkler, fire detection and fire alarm systems;
    - ventilation systems, including fire and smoke dampers, fans and their controls;
    - emergency shut down of fuel supply;
    - fire doors, including their controls;
    - general emergency alarm systems;
    - emergency escape breathing devices;
    - portable fire extinguishers, including space charges; and
    - fire-fighter's outfits.

<u>Requirements</u>:

Ships are required by SOLAS Ch II-2 Reg 14.2.2 to test and inspect Fire Safety Systems to ensure that they remain ready for use. In complying with this requirement they must have a maintenance plan onboard which includes the following where installed:

1. fire mains, fire pumps and hydrants including hoses, nozzles and international shore connections;
2. fixed fire detection and fire alarm systems;
3. fixed fire-extinguishing systems and other fire extinguishing appliances;
4. automatic sprinkler, fire detection and fire alarm systems;

5. ventilation systems including fire and smoke dampers, fans and their controls;
6. emergency shut down of fuel supply;
7. fire doors including their controls;
8. general emergency alarm systems;
9. emergency escape breathing devices;
10. portable fire extinguishers including spare charges; and
11. fire-fighter's outfits.

The maintenance plan could be paper based or computer based and will normally be included in the ISM documentation. Failure to have a plan on board or failure to use the plan may also indicate problems with the ISM system onboard.

The purpose of this regulation is to maintain and monitor the effectiveness of the fire safety measures the ship is provided with. For this purpose, the following functional requirements shall be met:

Fire protection systems and fire-fighting systems and appliances shall be maintained ready for use; and fire protection systems and fire-fighting systems and appliances shall be properly tested and inspected.

Operational readiness

The following fire protection systems shall be kept in good order so as to ensure their required performance if a fire occurs:

- Structural fire protection, including fire-resisting divisions, and protection of openings and
- penetrations in these divisions;
- fire detection and fire alarm systems; and
- means of escape systems and appliances.

Fire-fighting systems and appliances shall be kept in good working order and readily available for immediate use. Portable extinguishers which have been discharged shall be immediately recharged or replaced with an equivalent unit.

A fixed fire fighting system may be any of a fixed gas, fixed foam or fixed water spray system for the protection of machinery spaces. In some cases a steam smothering system may be permitted by the Administration.

Maintenance records should be available for inspection on board. Ch II-2 Regulation 14.2.2 requires a maintenance plan to be on board and this should show the frequency of checks required for the fixed fire fighting system and what work should be carried out.

Some of the checks may be carried out by ships staff and some of the work will be carried out by specialist service agents.

Normal checks carried out by ships staff will include testing of the alarms, checking the security of the CO2 cylinders, checking the security of the connecting pipes of CO2 storage cylinders, checking compressors, testing of foam generators, sampling of foam compound, checking foam levels, testing of water pumps, blowing through discharge lines with compressed air, visual

inspection of distribution pipe work and nozzles, visual check of cylinder discharge valves and any release mechanisms, visual check of external cylinder condition.

Checks carried out by specialist staff may include the checks carried out by ships staff and in addition a level check of CO2 storage cylinders for correct quantity of extinguishing medium, pressure test of storage cylinders, operation of release mechanisms, replacement of flexible hose, test of foam compound, test of foam generator and flush through of pipe work.

6. Is the crew familiar with the location and operation of fire-fighting systems and appliances that they may be called upon to use? SOLAS Ch II-2 R 15.2.2 (Def Code 07123)

This question should be answered either yes or no. There is no provision for this question to be answered as 'not applicable' If the question is answered as 'no' then the PSCO should consider whether or not there is a serious risk to the safety of the crew, the ship and the marine environment and whether or not the deficiencies can be rectified before departure. PSCO may need to return to the vessel to verify familiarity and a detention may be considered.

Items to check:

Check that the Crew is capable of:

- Explaining the use of portable fire extinguishing equipment – *all crew*
- Explaining the method of operation of the fixed fire fighting installations in both normal and emergency operation – *designated crew*
- Understanding the importance of fire doors and the need for designated self closing doors to be kept closed by *all crew*
- Understanding the structural fire protection arrangements fitted to their ship with reference to the fire plan – *designated crew*
- Knowing the location of the fire plans and understanding the information contained – *all crew*
- Demonstrating ventilation shut down and control – *designated crew.*
- Carrying out checks on breathing apparatus and donning the fire-fighter's outfit.
- Demonstrating the operation and test of the fire detection system including how to reset the control unit and identify any faults indicated – *designated crew*
- Operating crew alarm systems
- Using EEBD's
- Location and operation of escape routes.
- Check that there are records to show when the general alarms were last tested and the fire fighters outfits checked. These should at least have been checked at the fire drills required by SOLAS Ch II-2/R15.2.2 and Ch III/R19.3. Chapter III specifies the items of fire fighting equipment that must be checked and recorded at each drill.

Requirements:

SOLAS Ch II-2 Reg 15.2.2 requires that crew members shall be trained to be familiar with the arrangements of the ship as well as the location and operation of fire-fighting systems and appliances that they may be called upon to use. Drills shall be carried out in accordance with and at frequency required by Ch III/R 19.

In order to test fire-fighting systems and appliances effectively crew should have knowledge of both the location and operation of the equipment and any lack of familiarity might indicate that testing has not been carried out or that onboard familiarization training (STCW Reg I/14) has been ineffective or that drills have not been carried out. Not all crew will be able to operate all the fire fighting equipment on board, however there should be sufficient personnel on board capable of operating main and emergency fire pumps, deck foam systems, fixed fire fighting installations, ventilation controls etc and it may be a cause for concern if, for example deck officers have to call engine room staff to demonstrate tests of these systems to PSCO.

7. Does the test of the sprinkler system trigger an automatic visual and audible alarm for the section? (ships which have a sprinkler system fitted) SOLAS Ch II-2 R 10.6 (Def Code 08103)

Items to check:

- Check that sprinkler systems including fire detection and fire alarm systems, are switched on and clear of any fault indications or active alarms on bridge and safety store indicating panels.
- Check that active alarms are immediately investigated by the officer on watch. The Crew must be familiar with the handling and function of the sprinkler system.
- Check that the sprinklers are grouped into acceptable sections.
  - On passenger ships, a sprinkler section may extend only over one main vertical zone or one watertight compartment and may not include more than two vertically adjacent decks. The sprinklers are to be so arranged in the upper deck area that a water volume of not less than 5 litre/m2 and per minute is sprayed over the area to be protected.
  - Inside accommodation and service spaces the sprinklers are to be activated within a temperature range from 68 °C to 79 °C.
  - This does not apply to spaces with higher temperatures such as drying rooms, galleys. The sprinklers are to be made of corrosion-resistant material.
- Check that the indication and alarm systems of each sprinkler section is provided with means for the activation of a visual and audible alarm signal at one or more indicating panels.
- At the panels, the sprinkler section in which a sprinkler has come into operation is to be indicated.
- Check that the indicating panels are centralised on the navigation bridge.
- In addition to this, visible and audible alarms from the indicating panels are to be located in a position other than on the navigation bridge, so as to ensure that an alarm is immediately received by the crew.
- Check that a test valve is arranged downstream of each section valve.

- Check that a gauge indicating the pressure in the system is provided at each section valve as well as at the centralised indication panel(s) on the navigating bridge.
- Check that a list or plan is to be displayed at indicating panels showing the spaces covered and the location of the zone in respect of each section.
- Check that suitable instructions for testing and maintenance are available.

Requirements:

It is important to note that PSCO's should not under normal circumstances activate the sprinkler head.

This question refers to **SOLAS II-2 Reg. 10.6** .

The purpose of this question is to verify that the fire can be suppressed and swiftly extinguish in the space of origin. For this purpose, the following functional requirements shall be met:fixed fire-extinguishing systems shall be installed, having due regard to the fire growth potential of the protected spaces; and fire-extinguishing appliances shall be readily available.

SOLAS II-2 / Reg. 10.6.1.1. Sprinkler systems in passenger ships,
Passenger ships carrying more than 36 passengers shall be equipped with an automatic sprinkler, fire detection and fire alarm system of an approved type complying with the requirements of the Fire Safety Systems in all control stations, accommodation and service spaces, including corridors and stairways. Alternatively, control stations, where water may cause damage to essential equipment, may be fitted with an approved fixed fire-extinguishing system of another type. Spaces having little or no fire risk such as voids, public toilets, carbon dioxide rooms and similar spaces need not be fitted with an automatic sprinkler system

SOLAS II-2 / Reg. 10.6.1.2. In passenger ships carrying not more than 36 passengers, when a fixed smoke detection and fire alarm system complying with the provisions of the Fire Safety Systems Code is provided only in corridors, stairways and escape routes within accommodation spaces, an automatic sprinkler system shall be installed in accordance with regulation 7.5.3.2.

SOLAS II-2 / Reg. 10.6.2. Sprinkler systems for cargo ships,
In cargo ships, an automatic sprinkler, fire detection and fire alarm system shall be fitted in accordance with the requirements in regulation 7.5.5.2
Spaces containing flammable liquid for example (Paint lockers) may be protected by a water spraying or sprinkler system, designed for 5 l/m² min. Water spraying systems may be connected to the fire main of the ship.

Instructions for carrying out of periodic tests should be exhibited prominently at the control station. It is normally possible to simulate the activation of a sprinkler head and test the automatic starting of the pump and the alarm using the test valve. PSCO should request this test to be demonstrated by the ships staff.

8. Does the activation of any detector or manually operated call point initiate a visual and audible fire signal at the control panel on the bridge or control station? (all ships) SOLAS Ch II-2 R 7.4.2 (Def Code 07106)

This question should be answered either yes, no, n/a. If the question is answered 'no' then the PSCO should consider whether or not there is a serious risk to the safety of the crew, the ship and the marine environment and whether or not the deficiencies can or will be rectified before departure. A detention may be considered.

<u>Items to check</u>:

The purpose of this regulation is to detect a fire in the space of origin and to provide alarm for safe escape and fire-fighting activity. For this purpose, the following functional requirements shall be met:

1. Fixed fire detection and fire alarm system installations shall be suitable for the nature of the space, fire growth potential and potential generation of smoke and gases;
2. Manually operated call points shall be placed effectively to ensure a readily accessible means of notification; and
3. Fire patrols for passenger ship shall provide an effective means of detecting and locating fires and alerting the navigation bridge and fire teams.

- Check that there is fixed fire detection and fire alarm system and a sample extraction smoke detection system required in this regulation and that it is of an approved type.
- Check that, where a fixed fire detection and fire alarm system is required for the protection of spaces, at least one detector complying with the requirements of the regulation shall be installed in each such space.
- Check that the function of fixed fire detection and fire alarm systems is being tested under varying conditions of ventilation after installation.
- Check that the function of fixed fire detection and fire alarm systems is being periodically tested to the satisfaction of the Administration by means of equipment producing hot air at the appropriate temperature, or smoke or aerosol particles having the appropriate range of density or particle size, or other phenomena associated with incipient fires to which the detector is designed to respond.
- Check that, for protection of machinery spaces a fixed fire detection and fire alarm system has been installed in periodically unattended machinery spaces and machinery spaces where the installation of automatic and remote control systems and equipment has been approved in lieu of continuous manning of the space; and the main propulsion and associated machinery including sources of main source of electrical power are provided with various degrees of automatic or remote control and are under continuous manned supervision from a control room.
- Check that the detection system shall initiate an audible and visual alarm distinct in both respects from the alarms of any other system not indicating fire, in sufficient places to ensure that the alarms can be heard and observed on the navigating bridge and by a responsible engineer officer.
- Check that when the navigating bridge is unmanned the alarm sounds in a place where a responsible member of the crew is on duty.

- Check that smoke detectors are installed in stairways, service spaces, control stations, corridors and escape routes within accommodation spaces depending on ship type. Consideration shall be given to the installation of special purpose smoke detectors within ventilation ducting.
- Check that Passenger ships are, when at sea or in port (except when out of service), so manned or equipped as to ensure that any initial fire alarm is immediately received by a responsible member of the crew.
- Check that Passenger ships carrying more than 36 passengers have the fire detection alarms for the systems centralized in a continuously manned central control station. In addition, controls for remote closing of the fire doors and shutting down the ventilation fans shall be centralized in the same location.
- Check that the ventilation fans are capable of reactivation by the crew at the continuously manned control station.
- Check that the control panels in the central control station are capable of indicating open or closed positions of fire doors and closed or off status of the detectors, alarms and fans.
- Check that the control panel is continuously powered and shall have an automatic change over to standby power supply in case of loss of normal power supply.
- Check that the control panel is powered from the main source of electrical power and the emergency source of electrical power.
- Check that a special alarm, operated from the navigation bridge or fire control station, is fitted to summon the crew. This alarm may be part of the ship's general alarm system and shall be capable of being sounded independently of the alarm to the passenger spaces

Requirements:

This question refers to SOLAS II-2 Reg 7

Requirements for passenger ships carrying more than 36 passengers:

- A fixed fire detection and fire alarm system has been installed and arranged as to provide smoke detection in service spaces, control stations and accommodation spaces, including corridors, stairways and escape routes within accommodation spaces. Smoke detectors need not be fitted in private bathrooms and galleys. Spaces having little or no fire risk such as voids, public toilets, carbon dioxide rooms and similar spaces need not be fitted with a fixed fire detection and alarm system.

Requirements for passenger ships carrying not more than 36 passengers:

- There shall be installed in all accommodation spaces and service spaces and, where it is considered neccessary by the Administration, in control stations, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc., either:
- a fixed fire detection and fire alarm system shall be installed and arranged as to detect the presence of fire in all accommodation spaces and service spaces providing smoke detection in corridors, stairways and escape routes within accommodation spaces; or

- an automatic sprinkler, fire detection and fire alarm system of an approved type complying with the relevant requirements of the Fire Safety Systems Code have be installed and arranged as to protect such spaces and, in addition, a fixed fire detection and fire alarm system has been installed and arranged as to provide smoke detection in corridors, stairways and escape routes within accommodation spaces.

Requirements for cargo ships:

- Accommodation and service spaces and control stations of cargo ships are protected by a fixed fire detection and fire alarm system and/or an automatic sprinkler, fire detection and fire alarm system as applicable;
- A fixed fire detection and fire alarm system shall be installed and arranged as to provide smoke detection in corridors, stairways and escape routes within accommodation spaces.

Manually operated call points for ships constructed on or after 1 September 1984:

- Manually operated call points have been installed throughout the accommodation spaces, service spaces and control stations. One manually operated call point shall be located at each exit. Manually operated call points shall be readily accessible in the corridors of each deck uch that no part of the corridor is more than 20 m from a manually operated call point.

- Manual fire alarm systems may be combined with an automatic fire detection and alarm system and should be so arranged that a fire alarm can be raised, even though a zone or zones in the automatic detection system have been disconnected for maintenance or repair.

9. Is the lighting in escape routes, including the Low Location Lighting systems where applicable maintained? (all ships) SOLAS Ch II-2 R 13(Def Code 07120)

Items to check:

- Check in all passageways, LLL should be continuous.
- Check to ensure LLL is installed at least on one side of the corridor.
- Checks in dead-end corridors, LLL have arrows or equivalent directions, indicators.
- Check that IMO symbols are incorporated into LLL which directs passengers to the muster stations as required by regulation Ch II-2/R13.
- Check that passenger cabins have placard explaining LLL system.
- Check LLL lead to exit door handle.
- Check for LLL signs provided at exits.
- Check that electrically powered systems are connected to emergency switch boards as required by Ch II-1/ R42.
- Check that maintenance of LLL is carried out at least once a week and record kept.
- Check for any missing, damaged or inoperable LLL.
- Check additional equipment to the emergency lighting for ro-ro passenger ships.

Requirements:

This question refers to SOLAS CII-2/R13. The purpose of this regulation is to provide means of escape so that persons on board can safely and swiftly, escape to the lifeboat and liferaft embarkation deck.

The lighting and the Low Location Lighting (LLL) systems are solutions to meet parts of the functional requirements for example escape routes to be maintained in safe conditions and clearly marked.

a) Lighting regulation is divided between cargo and passenger ships. Moreover specific requirements are dedicated to ro-ro passenger ships. Bearing in mind the emergency situation, it's possible to focus on lighting supplied by emergency source of electrical power. The period of lighting is determined by the type of ship, but the main goal of this question is to verify the effectiveness of the escape route lighting.

CARGO SHIPS: SOLAS CII-1/R43: Emergency lighting is required at every muster and embarkation station, over the sides and in exits.

PASSENGER SHIPS: SOLAS CII-1/42: Emergency lighting is required at every assembly and embarkation station, over the sides, and in exits giving access to the assembly and embarkation stations.

RO-RO PASSENGER SHIPS: SOLAS CII-1/42-1: Additional equipment to the emergency lighting required by regulation 42, on every passenger ship with ro-ro cargo spaces or special category spaces, all passenger public spaces and alleyways must be provided with supplementary electric lighting. The approach to the means of escape must be readily seen.

To achieve the functional requirements, routes to assembly stations must be indicated with the assembly station symbol, intended for that purpose, in accordance with the recommendation of the Organization. (SOLAS CII-2/R13.7 and CIII/R 11.4 & 5).

b) The LLL system can be electrically powered lighting or photo luminescent strips or indicators placed at points of escape routes, to readily identify such routes when the normal emergency light is less effective due to smoke.

The installation of LLL should be fitted in accordance with approved documents during the building of the ship. During the documentary check, key crew members have to produce the care and maintenance concerning this installation. Technical product documentation must be kept on board with the following documents: installation plan, list of items depicted in the installation plan, description of installation, comparative specimen sketches/drawings and maintenance specification (ISO 15370).

***10. Is the Emergency Fire pump, capable of producing at least two jets of water? (all passenger ships and all cargo ships above 1000 grt) SOLAS Ch II-2 R 10.2.2.3.1 and R 10.2.2.4.2 (Def Code 04102)**

This question should be answered as yes. If the question is answered 'no' then the PSCO should consider whether or not there is a serious risk to the safety of the crew, the ship and the marine environment and whether or not the deficiencies can or will be rectified before departure. A detention may be considered . R.10.2.2.4.2 Each of the required fire pumps (other than any emergency pump for cargo ships) shall have a capacity of not less than 80% of the Total required capacity divided by the minimum number of required fire pumps, but in any case not less than 25 metric cube/hour. And each pump shall in any event be capable of delivering at least the two jets of water.

For ships built before 1-7-2002 – SOLAS Ch.II-2/Reg4.3.3.2.

Items to check:

- Check that the Emergency Fire Pump works under operating conditions, including at anchor, in ballast and when loaded and pulling away from the quay. During PSC inspections it I found that some vessels have difficulties in delivering the quantity of water by the Emergency Fire Pump in light ship condition. The total suction head and the net positive suction head of the emergency pump shall take into consideration all service conditions to be encountered.
- PSCO should ask the crew to connect two Fire Hose, one on a forward hydrant and one on an aft hydrant. The Emergency Fire Pump should be tested under the vessel's condition at the given time ONLY. "In **NO** case should the PSCO ask the crew to alter vessel's condition (trim and list) to the test the Emergency Fire Pump''.
- Check that the minimum capacity of required emergency fire pumps is sufficient to supply two jets of water at or above the required pressure and cope with leakages on the system from the hydrants, joints, holes etc. If the pump discharge pressure at the pump manometer is only about 0.3 N/mm2 (3 bar) it is likely that the pump is not performing satisfactorily.
- Check that the location of the space containing EFP is not contiguous to the boundary of the machinery space or these spaces containing main fire pumps.
- Check access to the emergency fire pump and its source of power.
- Check ventilation arrangements to the emergency fire pump space.
- Check the power supply and the means of operation of the pump

If the Emergency Fire pump performs satisfactorily as stated above, the box A (YES) should be ticked off on the questionnaire.

If the Emergency Fire Pump failed to perform as stated above, the box B (NO) should be ticked off on the questionnaire and the PSCO should use his professional judgment to determine whether the vessel should be considered for detention.

If Ship does not have Emergency Fire Pump then the PSCO should verify which pump is designated to meet the requirement under Regulation 10.2.2.3.1.2.

Requirements:

Interpretation concerning emergency fire pump capacity was agreed upon and circulated as MSC.1/Circ.1314 at the 86 session of the IMO Maritime Safety Committee (MSC 86) held in May 2009.

The Emergency Fire Pump shall as a minimum comply with paragraph 2.2.1.1 of the FSS code C12. Where a fixed water-based fire-extinguishing system installed for the protection of the machinery space in accordance with SOLAS Regulation II-2/10.4.1.1 is supplied by the Emergency Fire Pump, then the Emergency Fire Pump capacity should be adequate to supply the fixed fire-extinguishing system at the required pressure plus two jets of water under ALL conditions of list, trim and draft encountered in service. The capacity of the two jets should in any case be calculated at not less than 25 m3/h. The minimum pressure referred to in paragraph 2.2.1.2 should be 0.27 N/mm2.

Which Ships are fitted with Emergency Fire Pump:

- Cargo Ships of GT 2000 and upwards constructed from 25-5-1980 Up to 1-7-2002 if a fire in any one compartment could put all the pumps out of action. SOLAS 74 Convention/II-2/Reg.52, SOLAS 81,83,89/90,91/92 Amend/II-2/Reg.4 & SOLAS 04/II-2/Reg.10/2.2.3.1.2

- Passenger Ship of less than GT 1000 and Cargo Ships constructed from 1-7-2002, if a fire in any one compartment could put all the pumps out of action. SOLAS 99/00 Amend/II-2/Reg10.2.2.3.1

The Emergency Fire Pump, it's seawater inlet, suction and delivery pipes shall be located outside the machinery space. If this arrangement cannot be made:

- For ships constructed from 1 September 1984 Up to 1 July 2002, SOLAS 81,83,89/90,91/92 Amend/II-2/Reg.4, only short length of the Emergency Fire Pump suction and discharge piping might be allowed to penetrate the machinery space.

- For ships constructed on and after 1 July 2002. SOLAS 99/00 Amend/II-2/Reg.10.2.1.4.1, the sea-chest may be fitted in the machinery space if the valve is remotely controlled from a position in the same compartment as the emergency fire pump and the suction pipe is as short as practicable. The pipe should be welded except for the flanged connection to the sea inlet valve.

11. Are the Isolating valves of the fire main marked, maintained and easily operable? SOLAS Ch II-2 R10.2.1.4 (Def Code 07113)

Items to check:

- Check that the Isolating Valves are operating effectively by asking the crew to open/close the Isolating Valves thus to confirm that they are not seized and their operation is smooth,
- Check that the source of water pressure is indeed from the fire pump that is in operation. Ask crew to have the Isolating Valves shut and one of the E/R main fire pumps in operation. By opening a fire hydrant on deck, there should be no pressure in the line and no water coming out from the hydrant.
- Check that the crew are familiar with the location of the Isolation valves
- Check for markings clearly indicating are Fire Main Isolation valves.

Requirements:

Every Ship constructed o nor after 1 September 1984. SOLAS 81,83,89/90,91/92 Amend/II-2/Reg.4 & SOLAS 99/00 Amend/II-2/Reg.10.2.1.4.1, shall be fitted with **"** Isolating Valves **"** . They are used to separate the section of the fire main within the machinery space containing the main fire pump or pumps from the rest of the fire main.

Isolating Valves shall be fitted in an easily accessible and tenable position outside the machinery spaces.
The fire main shall be so arranged that when the isolating valves are shut all the hydrants on the ship, except those in the machinery space referred to above, can be supplied with water by another fire pump or an emergency fire pump.

If the Isolating Valves perform satisfactorily as stated above, the box (YES) should be ticked off on the questionaire.
If the Isolating Valves failed to perform as stated above, the box (NO) should be ticked off on the questionaire and the PSCO should **use his professional judgment to determine whether the vessel should be considered for detention** .
If the Ship was constructed before 1-9-1984 and is not fitted with Isolating Valves then the answer should be N/A.

***12. Where a fire drill witnessed by the PSCO was it found to be satisfactory? SOLAS Ch II-2 R 15.2.2.5 (all ships) (Def Code 04109**

Where no drill is witnessed tick box "NA"

This question should be answered either yes, no or where no drill is witnessed check n/a. Where a fire drill is witnessed and the question is answered as 'no' then the PSCO should consider whether or not there is a serious risk to the safety of the crew, the ship and the marine environment and whether or not the deficiencies can or will be rectified before departure. A detention may be considered.

The purpose of this question is to ensure that in the course of the CIC, Where "Clear Grounds" have been established the PSCO should conduct an operational fire drill, however the PSCO must not request a fire drill, which in the judgment of the master could jeopardize the safety of the ship, crew, passengers or cargo.

Where **clear grounds*** exists, every inspection will have to be completed by witnessing a fire drill, unless due to exceptional circumstances a fire drill could not be held the reason for not having the drill should be recorded in the system.

The main purpose of witnessing the fire drill is three fold;

1. To verify the crew can organize in an event following an emergency,
2. Crew can communicate, receive and carry out instruction efficiently and
3. To ensure the master is in control of the emergency and the information flow is from one central command location.

A fire drill shall as far as practicable be conducted as if it were an actual emergency. For the purpose of a fire drill an outbreak of fire should be assumed to have occurred in some part of the ship and fire control measures simulated as appropriate. The PSCO must always remember that the equipment may be in good working order but there may be a complete failure of the fire fighting action due to poor or inadequate crew training or familiarization.

The complete cooperation of the personnel from all departments is essential in fire fighting on board a ship. The type and position of the supposed fire should be varied from time to time and can include:

1. Cargo fires in holds or other spaces;
2. Fires involving oil, gas or chemical cargoes as appropriate;
3. Fires in engine, pump or boiler rooms;
4. Fires in crew or passenger accommodation; and
5. Fires in galleys due to burning oil or cooking fats.

The engine room staff should ensure that the fire pumps in the machinery spaces are prepared for Operation, started, and that full water pressure is on the fire mains. Where there is an emergency fire pump situated outside the machinery space, this pump should be started up as well. The fire party or parties at the scene of the assumed fire should lay out hoses and where practicable water should be played through them, the water being supplied first from the machinery space pump and then from the emergency pump only, with the machinery space isolating valve closed. A number of portable fire extinguishers should be available and members of the fire party should be instructed in the use of the type.

The crew should be exercised as appropriate in the closing of openings, i.e. side scuttles, deadlights, doors, ventilating shafts, fire doors, the annular space around the funnel, etc both to reduce the supply of air to a fire and isolate it from other parts of the ship, especially stairways and lift shafts. As many of the crew as possible and particularly the officers should be made familiar with the position of remote controls for ventilation fans, oil fuel pumps and oil tank valves and be instructed in the
method of operation thereof.

Fixed installations for extinguishing fire, such as CO2, foam, or water spray in the machinery spaces, CO2, inert gas, steam or drencher systems in the cargo spaces, and sprinkler systems in passenger accommodation together with fire alarm and detection systems should be tested with as much realism as practicable. The fire party should also be exercised in the use of the breathing apparatus and protective clothing and such emergency appliances as axes and safety lamps, which should be brought out, checked and deployed by appointed members of the party at all fire drills. Where the number of sets of breathing apparatus permits, it is recommended that persons using them should practice in pairs.

At each fire drill portable fire extinguishers should be available for demonstration of the manner of their use. If extinguishers are operated by a member of the fire party, extinguishers so used should be immediately recharged before being returned to their normal location S74/C-II R 10.3.3.

Crew members should also be familiar with the location and means of activating the fire alarms in the accommodation and in their working areas. It is also important that all crew members and particularly those whose place of work is in a machinery space are familiar with the escape routes from any part of the ship they are likely to be in when on or off duty. Such familiarity should enable escape to be made in darkness or through smoke and should include familiarity with the location and the means of opening any emergency escape windows or hatches.

All fire protection systems and appliances should at all times be in good order and available for immediate use during the voyage and in port. Compressed air bottles of breathing apparatus and fire extinguishers should be refilled after any drill. Where refilling facilities are not available on board additional equipment may be carried to facilitate training. Discharged equipment should be clearly marked and stored for refilling when in port. Equipment dedicated for training purposes should be marked ‘for training purposes only’**.**

***Examples of “clear grounds”.**

In addition to the examples of “clear grounds” given in paragraph 2.4.2 of Port State Control Procedures 2011 (Resolution A.1052(27)). Clear grounds found during an initial inspection which may warrant an operational drill could be but are not limited to the following:

a. Muster List does not conform to SOLAS Chapter III Regulation 8,
b. Random questioning of the crew going about their normal duties reveals:
    a. a lack of knowledge of what their emergency duties are,
    b. a lack of knowledge of the use of emergency equipment that they should be reasonably familiar with,
    c. key members of crew are unable to communicate with each other.
c. Inspection of logbooks/records reveals that drills have not been carried out as required by SOLAS Ch III Regulation 19 or as required by the Safety Management System,
d. There is evidence that the crew have not been trained in accordance with SOLAS Ch III Regulation 19,
e. Serious deficiencies in Fire Fighting Equipment.
f. For passenger ships – the absence of a decision support system as required by SOLAS Ch III Regulation 29,
g. Crew unfamiliar with Fire-fighting Training Manual and Fire Safety Operational Booklet.

13. Was the ship detained as a result of the CIC?

The question requires a "Yes" or "No" response, take note this question relates only to detainable deficiencies found from completing the FSS questionnaire.

If a ship is detained as a result of deficiencies found from the item listed in the questionnaire, PSCO's should respond "YES" to question 13.

If a ship is detained as a result of deficiencies found from a broader PSC inspection, PSCOs should respond "No" to question 13.