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20 July 2012

To: Shipowners, Ship Managers and Ship Masters

Dear Sirs/Madams,

Concentrated Inspection Campaign on Fire Safety Systems Conducted from 1 September to 30 November 2012

The Paris MOU and the Tokyo MOU will jointly conduct the Concentrated Inspection Campaign (CIC) on Fire Safety Systems from 1 September to 30 November 2012. Other MOUs may follow the same routine during the campaign.

The campaign will target aspects of compliances with SOLAS Chapter II-2 on all vessels regardless of type. During the campaign, while carrying out a regular port State control inspection the fire safety arrangements, maintenance records and other applicable document will be verified in greater detail for ascertaining compliance with SOLAS Chapter II-2.

The CIC will focus on 12 areas with respect to Fire Safety Systems, which are considered critical that any non-compliance detected by a PSCO may result in ship detention.

To facilitate masters of Hong Kong registered ships to prepare for this CIC exercise, relevant guidelines for preparation of the CIC on fire safety systems of cargo ships are attached for reference (see Annex I). Your particular attention is drawn to take the following actions before the campaign:

- (a) ship management companies should distribute this circular letter and guidelines to their Hong Kong registered ships and make sure that all shipboard staff are fully aware of the campaign;
- (b) ship management companies and/or shipboard staff should carry out similar inspection to verify the compliance with the applicable requirements at all times, in particular prior to the commencement of the campaign; and
- (c) ship management companies should ensure that masters and officers onboard ship could communicate effectively with PSCOs. Since poor communications with PSCOs during inspection may lead to the detention of your ships.

During the CIC, PSCOs will apply a questionnaire listing a number of items to be covered during the campaign. The questionnaire has been published on the websites of the Paris MOU and the Tokyo MOU:

<http://www.parismou.org>
<http://www.tokyo-mou.org>

May I reiterate that maintaining a good PSC record for the Hong Kong registered ships is an on-going task for all of us. Therefore, we should work closely and in co-operation to achieve the target.

If you have any question, please contact Senior Surveyor of Cargo Ships Safety Section as follows:

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Yours faithfully



(S.H. TSE)

Senior Surveyor of Ships
Cargo Ships Safety Section
for Director of Marine

Encl.

Annex I

Guidelines for Preparation of the Concentrated Inspection Campaign on Fire Safety Systems of Cargo Ships

Introduction

The Paris MOU and the Tokyo MOU will jointly conduct the Concentrated Inspection Campaign (CIC) on Fire Safety Systems from 1 September 2012 to 20 November 2012. Other MOUs may follow the same routine during the campaign.

Purpose

The purpose of this CIC is to get a detailed insight of the compliance of SOLAS Ch. II-2 as applicable in order to ensure that:

- (a) there is compliance with the requirements of the SOLAS convention as applicable;
- (b) the fire-fighting equipment is readily available and maintained at all times;
- (c) the master, officers and crew are familiar with equipment and have received training in carrying out their duties; and
- (d) to raise awareness of fire safety related issues.

Issued to be attended

The CIC will focus on the following 12 areas with respect to Fire Safety Systems, which are considered as critical areas for documentation, equipment and crew familiarization that any non-compliance detected by a PSCO may result in ship detention. Shipowners, ship management companies and ship's master should pay special attention to the following issues:

Q1 Does the Fire Control Plan meet the requirement?

- ✧ Fire control plans shall be permanently exhibited in a prominent position for the guidance of the ship's officers, showing clearly for each deck the control stations, the various fire sections enclosed by "A" or "B" class divisions, together with particulars of the fire detection and fire alarm systems, the sprinkler installation, the fire-extinguishing appliances, means of access to different compartments, decks, etc., and ventilating system, including particulars of the fan control positions, the position of dampers and identification numbers of the ventilating fans serving each section.
- ✧ Alternatively, 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.

- ✧ Fire control plans and booklets shall be kept up to date and any alternations thereto shall be recorded as soon as practicable.
- ✧ A duplicate set of fire control plans or a booklet containing such plans shall be permanently stored in a prominently marked weathertight enclosure outside the deckhouse for the assistance of shore-side fire-fighting personnel.
- ✧ Ship's crew shall be familiar with the fire control plans, or the booklet and their contents.
- ✧ For detailed requirements, please refer to SOLAS Reg. II-2/15.2.4.

Q2a Do the fire fighters' outfits including personal equipment comply with the requirement?

- ✧ A fire-fighter's outfit consists of a set of (refer to FSS Code Ch. 3 Paragraph 2.1):
 - (a) Personal equipment shall consist of the following:
 - ✧ 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;
 - ✧ boots of rubber or other electrically non-conducting material;
 - ✧ rigid helmet providing effective protection against impact;
 - ✧ electrical 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
 - ✧ axe with a handle provided with high-voltage insulation.
 - (b) Breathing apparatus shall consist of the following:
 - ✧ 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 minutes. All air cylinders for breathing apparatus shall be interchangeable.
 - (c) Lifeline:
 - ✧ for ships built from 25 May 1980 to 1 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 separate belt in order to prevent the breathing apparatus becoming detached when the lifeline is operated; and
 - ✧ for ships built on or after 1 July 2002 for each breathing apparatus a fire proof lifeline of at least 30 metres in length shall be provided. The lifeline shall successfully pass an approval test without failure. The lifeline shall be capable of being attached by means of a snap-hook to the harness of the apparatus or to separate belt in order to prevent the

breathing apparatus becoming detached when the lifeline is operated.

- ✧ Ships shall carry at least two fire-fighter's outfits. (refer to SOLAS Reg. II-2/10.10.2.1)
- ✧ For tankers, two additional sets of fire-fighter's outfit shall be provided. (refer to SOLAS Reg. II-2/10.10.2.3)
- ✧ For cargo ships carrying dangerous goods, at least two self-contained breathing apparatuses additional to those required by SOLAS Reg. II-2/10.10.2.1 shall be provided. (refer to SOLAS Reg. II-2/19.3.6.2)
- ✧ 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. 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. (refer to SOLAS Reg. II-2/10.10.3.1)
- ✧ Air cylinder of breathing apparatus shall be properly maintained with sufficient pressure at all times.
- ✧ Two spare air cylinders must be provided for each set of breathing apparatus; and if there is a means of recharging the cylinders on board with a suitable compressor, only one spare cylinder per set is needed. (refer to SOLAS Reg. II-2/10.10.2.5)
- ✧ Low pressure warning device of breathing apparatus with whistle sounding shall be maintained as per manufacturer's instructions. Testing of the device shall be carried out periodically and before it is used.
- ✧ Maintenance, testing and inspections shall be carried out based on the IMO guidelines detailed in MSC/Circ.850 and in a manner having due regard to ensure the reliability of the appliances. (refer to SOLAS Reg. II-2/14.2.2.1)
For examples:
 - (a) weekly testing and inspection for breathing apparatus cylinders do not present leakage;
 - (b) monthly inspection for all fire-fighter's outfits to verify that they are in place, properly arranged and are in proper condition;
 - (c) annual inspection for breathing apparatus air recharging systems checked for air quality; and
 - (d) five-year service for hydrostatic testing for all self-contained breathing apparatus's cylinders, etc.
- ✧ The maintenance plan shall be kept on board the ship and shall be available for inspection. (refer to SOLAS Reg. II-2/14.2.2.2)
- ✧ Inspection and maintenance records shall be properly kept on board the ship.

- ✧ For detailed requirements, please refer to SOLAS Reg. II-2/10.10 and Reg. II-2/14.

Q2b Do the Emergency Escape Breathing Devices (EEBD) comply with the requirement?

- ✧ EEBD shall comply with the FSS Code Ch. 3 Paragraph 2.2. An EEBD is a supplied air or oxygen device only used for escape from a compartment that has a hazardous atmosphere and shall be of an approved type. The EEBD shall have a service duration of at least 10 minutes and include a hood or a full face piece, as appropriate, to protect the eyes, nose and mouth during escape. Hood and face pieces shall be constructed of flame-resistant materials and include a clear window for viewing. Brief instructions or diagrams clearly illustrating their use shall be clearly printed on the EEBD.
- ✧ All ships shall carry at least two EEBDs within accommodation spaces. (refer to SOLAS Reg. 13.3.4.2)
- ✧ On all ships, within machinery spaces, EEBDs shall be situated ready for use at easily visible places, which can be reached quickly and easily at any time in the event of fire. The location of EEBDs shall take into account the layout of the machinery space and the number of persons normally working in the spaces. (refer to SOLAS Reg. II-2/13.4.3.1)
- ✧ For machinery space of category A containing internal combustion machinery used for main propulsion, EEBDs shall be considered to be positioned as follows:
 - (a) one EEBD in the engine control room, if located within the machinery space;
 - (b) one EEBD in workshop areas. If there is a direct access to an escape way from the workshop, an EEBD is not required; and
 - (c) one EEBD on each deck or platform level near the escape ladder constituting the second means of escape from the machinery space.
- ✧ In machinery spaces of category A not containing internal combustion machinery used for main propulsion - one EEBD, as a minimum, on each deck or platform level near the escape ladder other than a fire shelter, an escape trunk or a watertight access door to safe spaces.
- ✧ The number and location of these devices (EEBDs) shall be located in positions as indicated on the fire control plan and ready for immediate use.
- ✧ Spare EEBD shall be kept onboard with number and location shown on the fire control plan.

- ✧ Cylinders of EEBDs shall be maintained with sufficient pressure.
- ✧ The EEBDs shall be maintained in a state of operational readiness and should be tested and inspected in accordance with a planned maintenance system.
- ✧ The maintenance plan and its inspection and maintenance records shall be kept on board the ship and shall be available for inspection. (refer to SOLAS Reg. II-2/14.2.2.2)
- ✧ For detailed requirements, please refer to SOLAS Reg. II-2/13.3.4, Reg. II-2/13.4.3 and Reg. II-2/14.

Q3 Are the portable extinguishers ready for use in location as per the fire control plan?

- ✧ Portable fire-extinguishers shall be:
 - situated ready for use at easily visible places, which can 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;
 - provided with devices which indicate whether they have been used;
 - maintained in good order and be kept in place as per fire control plan and available for immediate use at all times; and
 - periodically inspected or serviced in accordance with the manufacturer's instructions and at intervals not exceeding one year.
- ✧ Type and quantity of extinguishing medium shall be properly arranged as per fire control plan.
- ✧ Maintenance plan and record shall show the date of inspection, the type of maintenance carried out and whether or not a pressure test was performed. Inspection and maintenance records shall be properly kept on board the ship.
- ✧ In ships constructed on or after 1 July 2002, carbon dioxide fire extinguishers shall not be placed in accommodation 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 (refers to SOLAS Reg. II-2/10.3.2.3)
- ✧ For detailed requirements, please refer to SOLAS Reg. II-2/10.3 and Reg. II-2/14.

Q4 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?

- ✧ Means shall be provided for automatically giving audible warning of the release of fire-extinguishing medium into any ro-ro spaces and other spaces in which personnel normally work or to which they have access. The pre-discharge alarm shall be automatically activated (e.g. by opening of the release cabinet door). The alarm shall operate for the length of time needed to evacuate the space, but in no case less than 20 seconds before the medium is release. Conventional cargo spaces and small spaces (such as compressor rooms, paint lockers, etc.) with only a local release need not be provided with such an alarm. (refer to FSS Code Ch. 5 Paragraph 2.1.3.2)
- ✧ Fixed CO₂ fire-extinguishing systems for the protection of machinery spaces and cargo pump rooms on ships constructed before 1 July 2002 shall comply with the provision of FSS Code Ch. 5 Paragraph 2.2.2 “Controls” by the first scheduled dry-docking after 1 January 2010 as follows:
 - (a) 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; and
 - (b) the two controls shall be located inside 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 shall be provided against the gas being accidentally released.
- ✧ Release arrangements shall give an indication if the system is being operated.
- ✧ Instructions for operating the installation shall be properly displayed near the remote operating controls, distribution control valves and also near the gas cylinders.
- ✧ Over-ride facilities shall be provided to enable spaces to be ventilated after the injection of CO₂ without entry into the protected space.
- ✧ Suitable notices shall be posted in vicinity of the ventilation system to indicate that provisions for automatic ventilation shut down have been fitted and where these are located.
- ✧ Notices shall be properly posted on the entrances to every space protected by CO₂ for warning purpose so that personnel can evacuate immediately on hearing the CO₂ alarm.

- ✧ Activation of any local application system shall give a visual and distinct audible alarm in the protected space and at continuously manned stations. The alarm shall indicate the specific system activated. Audible alarm and visual indication should be distinct from other alarms and comply with IMO Res. A.1021(26).
- ✧ 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. (refer to MSC.1/Circ.1318)
- ✧ Alternate power supply to electrical alarms shall be obtained from the emergency source batteries or through the emergency switchboard.
- ✧ Supplies for air operated devices shall be taken from the main air receivers through a safeguarded supply system.
- ✧ Alarms, if electric, shall be intrinsically safe and if of the air operated type shall be connected to a safeguarded moisture free supply, when such alarms are fitted in pump rooms.
- ✧ For detailed requirements, please refer to SOLAS Reg. II-2/10.5 and FSS Code Ch. 5.

Q5a Are the fire protection systems and fire-fighting systems and appliances maintained ready for use?

- ✧ In accordance with SOLAS Reg. II-2/14.2.1.1, the following fire protection systems shall be kept in good order so as to ensure their required performance if a fire occurs:
 - (a) structural fire protection, including fire-resisting divisions, and protection of openings and penetrations in these divisions;
 - (b) fire detection and fire alarm systems; and
 - (c) 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. (refer to SOLAS Reg. II-2/14.2.1.2)
- ✧ In cargo ships, with a periodically unattended machinery space or when only one person is required on watch, there shall be immediate water delivery from the fire main system at a suitable pressure, either by remote starting of one of the main fire pumps with remote starting from the navigating bridge and fire control station, if any, or permanent pressurization of the fire system by one of the main fire pumps. (refer to SOLAS Reg. II-2/10.2.1.2.2)

- ✧ Fire hoses and nozzles shall be in good condition, free of leaks and with effective shut off mechanism.
- ✧ Fire hydrants shall be capable of being shut off and that coupling match the hoses.
- ✧ Fire pump shall be capable of delivering for fire-fighting purposes enough quantity of water and pressure to supply two fire hoses, widely separated, and with an additional fire hydrant open to simulate a leak or pipe break.
- ✧ Portable fire extinguishers shall be maintained in good condition and last service records are available.
- ✧ Fixed pressure water spray or water mist systems shall be 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.
- ✧ Ventilation arrangements, fire dampers and the means for shutting down mechanical fans shall be inspected and tested. Inspection or testing record shall be properly maintained and ready for inspection.
- ✧ Remote fuel shut off valves and quick closing devices shall be periodically tested and confirm that that they are working properly. The crew shall be familiar with the procedures including remote shut off of the valves with the quick closing devices and reset of the valves to open position after closure.
- ✧ Active fire protection systems such as fire detection and fire alarm systems designed to indicate the presence of fire and warn the ships staff shall be maintained in good working condition without fault indications or active alarms. Fire detectors shall not be isolated. If active alarms occur, they shall be properly followed up by the crew.
- ✧ Random tests of a fire detector shall be carried out by the crew by using suitable test equipment. Oil rags and open flame should not be considered as suitable test equipment due to the fire risk and the likelihood of damaging the detectors.
- ✧ Random tests of manual call points shall be carried out by the crew.
- ✧ Escape routes
 - (a) acceptable means of escape shall be provided from a fire to a safe place, which includes escape routes, escape doors and hatches, ventilation or smoke extraction from escape routes and stairways;
 - (b) escape routes shall be clear of obstructions and illuminated by main and emergency lighting; and
 - (c) engine room escape trunks shall be fitted with a self-closing fire door at the points of entry and shall be well insulated either internally or externally

without damage to the insulation.

- ✧ Structural fire protection and fire doors and their self-closing devices shall be in good conditions. Fire doors shall not be tied back or have been removed or disabled.
- ✧ The training manual shall contain details on the fire protection arrangements on board.
- ✧ For detailed requirements, please refer to SOLAS Reg. II-2/14.2.1 and Reg. II-2/10.2.2.4.

Q5b 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?

- ✧ Fire protection systems and fire-fighting systems and appliances shall be properly tested and inspected.
- ✧ Maintenance, testing and inspections shall be carried out based on the IMO guidelines detailed in MSC/Circ.850, and in a manner having due regard to ensuring the reliability of fire-fighting systems and appliances. (refer to SOLAS Reg. II-2/14.2.2.1)
- ✧ The maintenance plan shall be kept on board the ship and shall be available for inspection. It could be paper based or computer-based. (refer to SOLAS Reg. II-2/14.2.2.2 & II-2/14.2.2.4)
- ✧ The maintenance plan shall include at least the following fire protection systems and fire-fighting systems and appliances, where installed (refer to SOLAS Reg. II-2/14.2.2.3):
 - (a) fire mains, fire pumps and hydrants, including hoses, nozzles and international shore connections;
 - (b) fixed fire detection and fire alarm systems;
 - (c) fixed fire-extinguishing systems and other fire-extinguishing appliances;
 - (d) automatic sprinkler, fire detection and fire alarm systems;
 - (e) ventilation systems, including fire and smoke dampers, fans and their controls;
 - (f) emergency shut-down of fuel supply;
 - (g) fire doors, including their controls;
 - (h) general emergency alarm systems;
 - (i) emergency escape breathing devices;
 - (j) portable fire extinguishers, including spare charges; and
 - (k) fire-fighter's outfits.

- ✧ In addition to the fire protection systems and appliances listed above, tankers shall have a maintenance plan for (refer to SOLAS Reg. II-2/14.4):
 - (a) inert gas systems;
 - (b) deck foam systems;
 - (c) fire safety arrangements in cargo pump-rooms; and
 - (d) flammable gas detectors.
- ✧ Some of the checks may be carried out by ships staff and some of the work will be carried out by specialist service agents.
- ✧ There are records on board to show that fire protection systems, fire-fighting systems and appliances have been periodically checked by specialist staff (normally not undertaken by the ship staff) such as:
 - (a) CO₂ cylinders inspection and pressure test records;
 - (b) Testing of the activating mechanism of the fixed fire-fighting systems; and
 - (c) Foam concentration analysis records.
- ✧ For detailed requirements, please refer to SOLAS Reg. II-2/14.2.2 and Reg. II-2/14.4.

Q6 Is the crew familiar with the location and operation of fire-fighting systems and appliances that they may be called upon to use?

- ✧ Crew members shall:
 - receive instruction on fire safety on board a ship. (refer to SOLAS Reg. II-2/15.2.1.1)
 - receive instructions on their assigned duties. (refer to SOLAS Reg. II-2/15.2.1.2)
 - be trained to be familiar with the arrangements of the ship as well as the location and operation of any fire-fighting systems and appliances that they may be called upon to use. (refer to SOLAS Reg. II-2/15.2.2.1)
- ✧ Performance of crew members assigned fire-fighting duties shall be periodically evaluated by conducting onboard training and drills to identify areas in need of improvement, to ensure competency in fire-fighting skills is maintained, and to ensure the operational readiness of the fire-fighting organization. (refer to SOLAS Reg. II-2/15.2.3)
- ✧ Onboard training in the use of the ship's fire-extinguishing systems and appliances shall be planned and conducted in accordance with the provisions of SOLAS Reg. III/19.4.1 (Onboard training and instructions).
- ✧ Fire drills shall be conducted and recorded in accordance with the provisions of SOLAS Reg. III/19.3 (Drills) and Reg. III/19.5 (Records).

- ✧ The aforementioned training includes the following:
 - (a) the use of portable fire extinguishing equipment;
 - (b) the use of fixed fire-fighting installations in both normal and emergency operation;
 - (c) operation and use of fire doors;
 - (d) understanding the structural fire protection arrangements fitted to their ship with reference to the fire plan;
 - (e) location of the fire plans and their information contained;
 - (f) operation and use of fire and smoke dampers;
 - (g) inspection of breathing apparatus and donning of the fire-fighter's outfit;
 - (h) test of fire detection system;
 - (i) operation of ship's alarm systems; and
 - (j) use of EEBDs and escape systems and appliances, etc.

- ✧ Sufficient personnel on board shall have knowledge of both the location and operation of the equipment, such as main and emergency fire pumps, deck foam systems, fixed fire-fighting installations, ventilation controls, etc.

- ✧ Drills shall, as far as practicable, be conducted as if there were an actual emergency. Every crew member shall participate in at least one abandon ship drill and one fire drill every month. The drills of the crew shall take place within 24 hours of the ship leaving a port if more than 25% of the crew members have not participated in abandon ship and fire drills on board that particular ship in the previous month. (refer to SOLAS Reg. III/19.3)

- ✧ Maintenance records for testing and inspection of fire-fighting systems and appliances, and drill exercises shall be properly recorded and maintained.

- ✧ For detailed requirements, please refer to SOLAS Reg. II-2/15.2.1, Reg. II-2/15.2.2 and Reg. III/19.

Q7 Does the test of the sprinkler system trigger an automatic visual and audible alarm for the section? (ships which have a sprinkler system fitted)

- ✧ In cargo ships in which method IIC specified in SOLAS Reg. II-2/9.2.3.1.1.2 is adopted, an automatic sprinkler, fire detection and fire alarm system shall be fitted in accordance with SOLAS Reg. II-2/7.5.5.2. (refer to SOLAS Reg. II-2/10.6.2)

- ✧ Method IIC – An automatic sprinkler, fire detection and fire alarm system of an approved type complying with the FSS Code shall be so installed and arranged as to protect accommodation spaces, galley and other service spaces, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc. In addition, a fixed fire detection and fire alarm system shall be so installed and arranged as to provide smoke detection in all corridors, stairways and escape

routes within accommodation spaces. (refer to SOLAS Reg. II-2/7.5.5.2)

- ◇ Spaces containing flammable liquid, for example, paint lockers may be protected by a water spraying or sprinkler system, designed for 5 l/m³ min. Water spraying systems may be connected to the fire main of the ship. (refer to SOLAS Reg. II-2/10. 6.3.1.3)
- ◇ The sprinkler systems including fire detection and fire alarm systems, shall be switched on for immediate operation at all times and no action by the crew shall be necessary to set it in operation. The fire detection and fire alarm system shall be clear of any fault indications or active alarms on bridge and fire control station indicating panels.
- ◇ The active alarms shall be immediately investigated by the officer on watch. The crew must be familiar with the handling and function of the sprinkler system.
- ◇ The sprinklers shall be resistant to corrosion by the marine atmosphere. In accommodation and service spaces the sprinklers shall come into operation within a temperature range from 68 °C to 79 °C except that in locations such as drying rooms, where high ambient temperatures might be expected. (refer to FSS Code Ch. 8 Paragraph 2.3.1)
- ◇ Each section of sprinklers shall include means for giving a visual and audible alarm signal at one or more indicating panels whenever any sprinkler comes into operation. (refer to FSS Code Chapter 8 Paragraph 2.5.2.1)
- ◇ At the panels, the sprinkler section in which a sprinkler has come into operation shall be indicated.
- ◇ The indicating panels shall be centralized on the navigation bridge. (refer to FSS Code Ch. 8 Paragraph 2.5.2.1)
- ◇ In addition to this, visible and audible alarms from the indicating panels shall be located in a position other than on the navigation bridge, so as to ensure that an alarm is immediately received by the crew. (refer to FSS Code Ch. 8 Paragraph 2.3.2.1)
- ◇ A test valve shall be provided for testing the automatic alarm for each section of sprinklers by a discharge of water equivalent to the operation of one sprinkler. The test valve for each section shall be situated near the stop-valve for that section. (refer to FSS Code Ch. 8 Paragraph 2.4.2.3)
- ◇ A gauge indicating the pressure in the system shall be provided at each section valve as well as at the centralized indication panel(s) on the navigating bridge. (refer to FSS Code Ch. 8 Paragraph 2.4.2.5)

- ✧ A list or plan shall be displayed at each indicating unit (panel) showing the spaces covered and the location of the zone in respect of each section. (refer to FSS Code Ch. 8 Paragraph 2.5.2.4)
- ✧ Suitable instructions for testing and maintenance shall be available. (refer to FSS Code Ch. 8 Paragraph 2.5.2.4)
- ✧ For detailed requirements, please refer to SOLAS Reg. II-2/10.6.2, Reg. II-2/7.5.5.2 and FSS Code Ch. 8.

Q8 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?

- ✧ The fixed fire detection and fire alarm system required in SOLAS Reg. II-2/7.4.1.1 (i.e. periodically unattended machinery spaces, etc.) shall be so designed and the detectors so positioned as to detect rapidly the onset of fire in any part of those spaces and under any normal conditions of operation of the machinery and variations of ventilation as required by the possible range of ambient temperatures. Except in spaces of restricted height and where their use is specially appropriate, detection systems using thermal detectors shall not be permitted. The detection system shall initiate audible and visual alarms distinct in both respects from the alarms of any other system not indicating fire, in sufficient places to ensure that alarms are heard and observed on the navigation bridge and by a responsible engineer officer. When the navigation bridge is unmanned, the alarm shall sound in a place where a responsible member of the crew is on duty. (refer to SOLAS Reg. II-2/7.4.2)
- ✧ Accommodation and service spaces and control stations of cargo ships shall be protected by a fixed fire detection and fire alarm system as applicable. (refer to SOLAS Reg. II-2/7.5.5)
 - ✧ 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. (refer to SOLAS Reg. II-2/7.5.5.1)
- ✧ Manual operated call points complying with the FSS Code shall be 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 such that no part of the corridor is more than 20 m from a manually operated call point. (refer to SOLAS Reg. II-2/7.7)
- ✧ Approved type of fixed fire detection, fire alarm system and a sample extraction smoke detection system shall be properly maintained.

- ✧ Where a fixed fire detection and fire alarm system is required for the protection of spaces, at least one detector complying with the regulation shall be installed in each such space.
- ✧ The function of fixed fire detection and fire alarm systems shall be tested under varying conditions of ventilation after installation.
- ✧ The function of fixed fire detection and fire alarm systems shall be periodically tested by means of hot air at appropriate temperature, or smoke or aerosol particles having appropriate range of density or particle size to which the detector is designed to respond.
- ✧ Fixed fire detection and fire alarm system shall be 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.
- ✧ 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.
- ✧ When the navigating bridge is unmanned the alarm sounds in a place where a responsible member of the crew is on duty.
- ✧ Smoke detectors shall be installed in stairways, service spaces, control stations, corridors and escape routes within accommodation spaces depending on ship type.
- ✧ Crew members shall be familiar with the operation of ventilation fans.
- ✧ Control panels in the central control station shall be capable of indicating open or closed positions of fire doors and closed or off status of the detectors, alarms and fans.
- ✧ Control panels shall be powered from the main source of electrical power and shall be automatically changeover to the emergency source of electrical power in case normal power failure.
- ✧ A special alarm, operated from the navigation bridge or fire control station, shall be fitted to summon the crew.
- ✧ For detailed requirements, please refer to SOLAS Reg. II-2/7.

Q9 Is the lighting in escape routes, including the Low Location Lighting systems where applicable maintained?

- ✧ Lighting and the Low Location Lighting systems are solutions to meet parts of the functional requirements for escape routes to be maintained in safe conditions and clearly marked.
- ✧ For cargo ships, SOLAS Reg. II-1/43 requires that emergency lighting is required at every muster and embarkation station, over the side and in exits.
- ✧ Alleyways, stairways and exits giving access to the muster and embarkation stations shall be lighted. Such lighting shall be capable of being supplied by the emergency source of electrical power. (refer to SOLAS Reg. III/11.5)
- ✧ For escape from machinery spaces of category A of cargo ships of 1,000 GT and upwards, two means of escape shall be provided from each machinery space by means of two sets of steel ladders, as widely separated as possible, leading to doors in the upper part of the space, similarly separated and from which access is provided to the open deck. One of these ladders shall be located within a protected enclosure, from the lower part of the space it serves to a safe position outside the space. The enclosure shall have emergency lighting provisions. (refer to SOLAS Reg. II-2/13.4.2.1)
- ✧ Emergency source of electrical power and all emergency lighting in escape routes shall be properly maintained and tested periodically. Inspection and testing records shall be kept on board properly.
- ✧ For detailed requirements and information, please refer to SOLAS Reg. II-1/43, Reg. II-2/13 and IMO Res. A.752(18) “Guidelines for evaluation, testing and application of low-location lighting on passenger ships”.

Q10 Is the Emergency Fire Pump, capable of producing at least two jets of water?

- ✧ In cargo ships, if a fire in any one compartment could put all the pumps out of action, there shall be an alternative means consisting of an emergency fire pump complying with the FSS Code Ch. 12 with its source of power and sea connection located outside the space where the main fire pumps or their sources of power are located. (refer to SOLAS Reg. II-2/10.2.2.3.1.2)
- ✧ The emergency fire pump shall work under operating condition, including at anchor, in ballast and when loaded and pulling away from the quay.
- ✧ Emergency fire pump capacity shall be adequate to supply the fixed fire extinguishing system at the required pressure plus two jets of water under all

conditions of list, trim, roll and pitch likely to be encountered in service. The capacity of two jets should in any case be calculated at not less than 25 m³/h and the minimum pressure should be 0.27 N/mm² (3 bar). If the pump discharge pressure at the pump manometer is only about 0.3 N/mm², it is likely that the pump is not performing satisfactorily.

- ✧ The space containing the emergency fire pump shall not be contiguous to the boundaries of machinery spaces of category A or those spaces containing main fire pumps. Where this is not practicable, the common bulkhead between the two spaces shall be insulated to a standard of structural fire protection equivalent to that required for a control station. (refer to SOLAS Reg. II-2/10.2.2.3.2.1)
- ✧ No direct access shall be permitted between the machinery space and the space containing the emergency fire pump and its source of power. Alternatively, the access may be through a watertight door capable of being operated from a space remote from the machinery space and the space containing the emergency fire pump and unlikely to be cut off in the event of fire in those spaces. In such cases, a second means of access to the space containing the Emergency fire Pump and its source of power shall be provided. (refer to SOLAS Reg. II-2/10.2.2.3.2.2)
- ✧ Ventilation arrangements to the space containing the independent source of power for the emergency fire pump shall be such as to preclude, as far as practicable, the possibility of smoke from a machinery space fire entering or being drawn into that space. (refer to SOLAS Reg. II-2/10.2.2.3.2.3)
- ✧ For detailed requirements, please refer to SOLAS Reg. II-2/10.2.2.3.1 and Reg. II-2/ 10.2.2.4.2.

Q11 Are the Isolating Valves of the fire main marked, maintained and easily operable?

- ✧ Isolating valves 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 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. The emergency fire pump, its seawater inlet, and suction and delivery pipes and Isolating valves shall be located outside the machinery space. (refer to SOLAS Reg. II-2/10.2.1.4.1)
- ✧ Ships constructed on or after 1 September 1984 shall be fitted with isolating valves.

- ✧ Isolating valves shall be properly maintained and clearly indicated by marking. Valves should be easily operable.
- ✧ Crew shall be familiar with the location and operation of the isolating valves.
- ✧ For detailed requirements, please refer to SOLAS Reg. II-2/10.2.1.4

Q12 Where a fire drill was witnessed was it found to be satisfactory?

- ✧ There are three aspects to be witnessed during a fire drill:
 - (a) whether crew members can organized properly in an event after an emergency;
 - (b) whether crew members can communicate, receive and carry out instruction efficiently; and
 - (c) whether the master can properly control the emergency.
- ✧ A fire drill shall as far as practicable be conducted as if it were an actual emergency. (refer to SOLAS Reg. III/19.3.1)
- ✧ Every crew member shall participate in at least one fire drill every month. (refer to SOLAS Reg. III/19.3.2)
- ✧ Fire drills should be planned in such a way that due consideration is given to regular practice in the various emergencies that may occur depending on the type of ships and the cargo. (refer to SOLAS Reg. III/19.3.4.1)
- ✧ The type and position of the supposed fire should be varied from time to time and can include fires involving oil, gas or chemical in engine room, pump room, accommodation, galleys and cargo holds, etc.
- ✧ Onboard training in the use of the ship's fire-extinguishing appliances shall be given as soon as possible but not later than two weeks after a crew member joins the ship. Instructions in the use of the ship's fire-extinguishing appliances shall be given at the same interval as the drills. Individual instruction may cover different parts of the ship's fire-extinguishing appliances, but all the ship's fire-extinguishing appliances shall be covered within any period of two months. (refer to SOLAS Reg. III/19.4)
- ✧ Muster list and emergency instructions complying with SOLAS Reg. III/37 shall be exhibited in conspicuous places throughout the ship including the navigation bridge, engine room and crew accommodation spaces. (refer to SOLAS Reg. III/8.3)
- ✧ Each fire drill shall include (refer to SOLAS Reg. III/19.3.4):
 - (a) reporting to stations and preparing for the duties described in the muster list;

- (b) starting of a fire pump, using at least the two required jets of water to show that the system is in proper working order;
 - (c) checking of fireman's outfit and other personal rescue equipment;
 - (d) checking of relevant communication equipment;
 - (e) checking the operation of watertight doors, fire doors, fire dampers and main inlets and outlets of ventilation systems in the drill area; and
 - (f) checking the necessary arrangements for subsequent abandoning of the ship.
- ✧ The equipment used during drills shall immediately be brought back to its fully operational condition and any faults and defects discovered during the drills shall be remedied as soon as possible. (refer to SOLAS Reg. III/19.3.4.3)
 - ✧ Crew members shall be familiar with:
 - (a) their emergency duties;
 - (b) the use of emergency equipment;
 - (c) able to communicate with each other (for key members of crew); and
 - (d) Fire-fighting Training Manual and Fire Safety Operational Booklet.
 - ✧ Drills shall be recorded in such log-book as may be prescribed by the Administration. (refer to SOLAS Reg. III/19.5)
 - ✧ Fire-fighting equipment shall be properly maintained without deficiencies.
 - ✧ For detailed requirements, please refer to SOLAS Reg. II-2/15.2.2.5, Reg. III/8, Reg. III/19.