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Ο ΔΙΕΥΘΥΝΤΗΣ ΣΧΟΛΗΣ :

DRILLS ON CRUISE SHIPS, CARGO SHIPS, TANKERS



Abandon Ship Drill - Courtesy C-DEBI

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INTRODUCTION

Emergency drills and training have the objective of preparing a trained and organized response to situations of great difficulty which may unexpectedly threaten loss of life at sea. It is important that they should be carried out realistically, approaching as closely as possible to emergency conditions. Drills and training should stress and include emergency procedure and equipment, emergency personnel duties, safety equipment tests, and any emergency related practice or regulation.

The frequency and scope of such training and drills are subject to standards laid down by international convention, national merchant shipping laws and the seismic industry.

The equipment installed on the Company's vessels varies and the requirements of this section should be complied with insofar as is applicable.

The date and the details of drills and exercises held, and on-board training given, should be recorded in the vessel's log book and included in appropriate daily, weekly and monthly reports.

The timing of the emergency drill should vary so that personnel who have not participated in a particular drill may participate in the next.

Any defects or deficiencies revealed during drills and the inspections that accompany them should be corrected without delay.

All personnel have a duty to familiarize themselves with their personal life-saving equipment, duties listed on the station bill and the emergency instructions posted in their cabins and on the station bill as soon as possible after joining the ship.

DRILLS ON CRUISE SHIPS, CARGO SHIPS, TANKERS

In spite of technological development the number of accidents at sea is not decreasing. Majority of the incidents have communication, lack of knowledge or experience, poor training, remissness, wrong management system and many others. Understanding the role of the human element within the system is essential for safety improvement. One of the ways of finding out about the dangers, which can occur onboard because of the human factor, is to check crew skills in practice and improve them with onboard training and drills.

Drills and trainings on boards of the ships are the essential part of seafarer's professions. There are many regulations which describe the way and frequency of drill conducting. Regulations 25 and 26 from Chapter III Safety of Life at Sea 74 Convention specify muster lists and drills practice on board of passenger and cargo vessels. The most important and requiring much attention are: abandon ship drill, firefighting drill and general emergency alarm drill. What is more every ship has a contingency plan concerning a procedure practice for a variety of situations that may occur on board of this vessel.

Preparation of the muster lists is an obligation of a ship master. It might be handed over to the designated deck officer; however, the lists have to be later approved by the captain. Muster lists have to be posted in easily accessible places such as main halls, mess rooms, engine room and bridge. Every crew member has to be acquainted with their duties, the alarm signals and procedures. For every conducted alarm or drill there has to be an entry to the alarm log book, which is required on board by Regulation 26a of Chapter III of SOLAS 74/78 Convention. If the drill was not conducted, the circumstances have to be given.

According to the SOLAS Convention drills on cargo ships with permanent crew have to be conducted at least once a month and on passenger ships at least once a week. The person in charge of planning and conducting of the alarms is a master of a ship. It is up to master's decision when, how and what kind of the alarm is going to be performed. The information about a drill might be given to the crew earlier or may be previously unannounced. In case of an unannounced drill it should be clearly stated that there is no real emergency, only a drill.

Chapter III of SOLAS 74 Convention does not have to be the only regulation concerning drills and trainings on board. Ship owners can introduce their own company requirements concerning the conduct of the alarms on the assumption that they will not be less restrictive than the SOLAS regulations.

According to the STCW 78/95 Convention every person working on board of the vessel has to have a Basic Safety Training Certificate issued by the authorized Authority. This certificate followed by a familiarization on board for some crew members is the sufficient level of knowledge. Crew members should realize that, although they went through the training on land, every vessel is different and equipped in various ways. During the familiarization the most important pieces of information are given, but only personal training will provide the crew member with the necessary skills. Drills and their different scenarios are a perfect opportunity of gaining and improving the knowledge and give the ability of finding the best solution in case of real emergency.

It must be also recognized that not every country, which is a signatory of the STCW 78/95 Convention, is able to control and maintain required level of on land training. The European Parliament and the Council of the European Union adopted amending Directive 2003/103/EC on the minimum level of training of seafarers. It states, that countries should be inspected to verify if Convention's requirements are fulfilled. European Maritime Safety Agency is responsible for states verification but the results and decisions have an application only on European flag vessels and waters. According to that every ship master should take into account that certified seafarer may not have required knowledge. Conducting drills and providing on board training may supplement deficiencies in on shore education.

Despite the importance of training in case of emergency, drills on some vessels are not being taken seriously enough. In many cases drills are conducted on board just to fulfill the company and conventions requirements. For some crew members drill is just another duty, which has to be done, often during their free time. This kind of attitude is often a reason for simplifying the alarms to the bare minimum. Drills are sometimes being limited just to gathering at the muster station and recitation of allotted duties. Although requirements are being fulfilled, this kind of drills does not prepare the crew for any real emergency situation and does not give the confidence to act properly in danger and under stress and panic conditions.

One of the reasons for this kind of attitude among crew members is a routine. Some seafarers, especially the older and more experienced ones, do not understand the matter of repeating the same actions every week or every month. They are convinced that they know perfectly what their duties and responsibilities in case of emergency are. In many cases this statement is false

DIFFERENT ATTITUDES TOWARDS DRILLS

To improve the quality of training on board of the ship it is important to change the seafarers' views on drills and alarms. The crew has to understand that conducted drills are not just their duty but the means to ensure their safety and increase the efficiency of the vessel's operation.

During my internship on board I had taken part in three types of drills:

- Drill with meeting at muster station;
- Drill with a roll call and some practical training;
- Drill proceeded by a theoretical training and followed by the discussion on the performance.

The first type of the drill was the simplest one. After the alarm signal the crew was gathering at muster station. After roll call and duties recitation the drill was over. This kind of alarm was the shortest and least demanding.

The second type of the drill was connected with some kind of performance. This could be for example, depending on the drill, lowering the lifeboat, putting on firefighter outfits or using the firefighter equipment. This kind of the drill was also conducted to satisfy the requirements, but required much more involvement from the crew members.

Among these three types the drill with theoretical basis and with final conclusions was the one I found the most valuable. This kind of the drill had to be prepared in advance. Proceeded by a theoretical training performed by the captain or designated officer, the drill was supposed to be conducted with as many actual details as possible. Afterwards the crew was gathering together again to discuss their actions, positive reactions and mistakes they had made with the captain. In such a discussion many decisions on improving the further actions were made.

PREPARING A DRILL SCENARIO

Except the most common and important drills such as abandon ship or firefighting drill, there is a variety of other dangers which may be encountered onboard and have to be practiced. Other drills can include collision, grounding, flooding, oil spill, piracy attack and many others.

For conducting a drill with educational value for the crew a theoretical training should be performed first. Crew members have to understand main hazards connected with each kind of emergency. The instructions may often sound obvious, e.g. for the situation like fire onboard, but not necessarily for the situation of imposing of the higher level of security according to ISPS Code. During the theoretical training the officer in charge should also discuss and explain the procedures used during the chosen case of emergency. Crew members should also know what the duties of other people on board are to understand the commands they are being given.

The way of communicating during the drill should also be set beforehand. The command chain should be established and phrases used clear. This can occur as an issue especially in a multilingual environment. Good communication during the emergency is essential.

The other issue that should be discussed and checked before the performance of the planned drill is the equipment, which is going to be used. The crew should be aware of the places where the equipment is being kept and of the ways of using it. The emergency equipment, depending on its purpose, can be stored in different, designated places. In case of outfits, their condition and sizes should be checked and well-marked. Expiry dates should be checked on some appliances and the effectiveness of operation inspected on the others.

When crew members are acquainted with the risks and purposes of conducting the drill, its scenario should be presented. As many information on the circumstances as it is required should be given, but the crew should also be aware of the fact, that the situation is dynamic and can change.

The master, who is in charge of the drill being performed, should monitor the crew's actions. If it is impossible, another person should be designated to do that. A few drills conducted during my work on board were filmed, so it was easier to discuss them afterwards.

When the drill was finished the crew would gather again and master would give the account of the issues which had arisen during the drill. The most common problems encountered during the alarm practices were:

- Too long period of emergency response;
- Mistakes in communication;
- Lack of equipment or equipment unusable;
- taking actions which could be dangerous in case of real danger;
- other, unexpected problems.

During the discussion each of these problems was analyzed. Their reasons were found and possible solutions suggested.

Most common solutions to the problems which occurred were:

- to shorten the time of response;
- to improve a command chain;

- to improve communication patterns;
- to adjust the duties of the crew members;
- to order, repair or replace the necessary equipment;
- to reduce the time of response in case of unexpected event.

As the additional task, deck cadets were supposed to describe all the actions taken and situations which arose during the drill and discuss them with the captain later.

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 h of the ship leaving a port if more than 25% of the crew have not participated in abandon ship and fire drills on board that particular ship in the previous month. When a ship enters service for the first time, after modification of a major character or when a new crew is engaged, these drills shall be held before sailing. The Administration may accept other arrangements that are at least equivalent for those classes of ships for which this is impracticable.

ABANDON SHIP DRILLS

Abandon ship drills will be conducted routinely during Company operations. Abandon ship drills shall include personnel training and inspecting and functionally testing safety equipment. They will be held at unscheduled times under supervision of the Safety Advisor and Vessel Master.

Abandon ship drills shall be conducted at least once a week. The scheduling of this drill shall be at the discretion of the Safety Advisor and/or Vessel Master. Drills will be held more frequently during the preliminary stages of the operation, or within 24 hours of crew changes exceeding 25% of personnel.

Abandon ship signal shall be **seven (7) short blasts** followed by **one (1) long blast** on the ship's general alarm. All life raft handling signals shall be sounded on the general alarm and shall be as follows: **one (1) short blast** = launch life rafts, **two (2) short blasts** = stop launching rafts. The dismissal signal from abandon ship drill is **three (3) short blasts**.

The abandon ship drill shall be conducted as if an actual emergency existed. All hands should report to their respective stations with exposure suits and personal flotation devices. They should be prepared to perform the duties specified in the station bill (posted in conspicuous places throughout the vessel).

Emergency lighting for mustering and abandonment shall be tested at each abandon ship drill.

Safety equipment such as the portable radio apparatus and first aid kit shall be brought from the emergency equipment lockers and the persons designated shall demonstrate their ability to use the equipment during each drill.

Visitors, if present, shall participate in the drill and shall be instructed in the use of personal flotation devices.

It is the Safety Advisor/Vessel Master's responsibility to ensure all personnel are properly trained in their emergency duties. The Safety Advisor/Vessel Master shall pay particular attention to crew changes with regard to personnel training and familiarization with their specific duties.

Each crew member shall participate in at least one exposure suit drill per month which is to include donning the exposure suit and being instructed in its use. Visitors, if present, shall be instructed in the proper use of exposure suits at each abandon ship drill.

The portable radio apparatus shall be tested weekly at each abandon ship drill.

The person in charge of each life raft shall have a muster list of all personnel under his command and shall ensure that they are familiar with their duties. Using the instruction placard posted at the life raft station, the person in charge shall instruct all personnel assigned to that station in the proper procedures used for launching a life raft, boarding a life raft and righting an inverted life raft. Proper life raft survival techniques, the dangers of hypothermia and how to minimize the effects of hypothermia shall be discussed during this drill. Descriptions of equipment contained in a life raft and instruction on how to use it shall also be given by the person in charge.

The person in charge of each life raft shall ensure that all personnel assigned to their life raft are suitably dressed and personal flotation devices are correctly donned. They shall also review the order to abandon ship as specified in the muster list.

An entry shall be made in the vessel's official logbook relative to each abandon ship drill, setting forth the date and hour, length of time of drill and description of training exercises conducted.

Each crew member shall become familiar with and practice the duties of the crew member who is listed immediately before him on the station bill.

ABANDON DRILL ON CRUISE SHIP

On any ship carrying passengers where the passengers are scheduled to be on board for more than 24 hours, a muster of the passengers must take place within 24 hours of their embarkation. Passengers must be given instruction in how to don their lifejackets and the action

to take on hearing the general emergency alarm signal. If only a small number of passengers embark after the muster has been held, it will be sufficient, instead of holding another, to draw the attention of these passengers to the emergency instructions referred to in paragraph 3.2. Similarly, on ships of Classes other than the above carrying passengers, if a muster of the passengers is not held on departure, their attention must be drawn to the emergency instructions referred to in paragraph 3.2. This can be done by means of a broadcast on the ship's public address system or by direct oral announcement.

It should be drawn to the attention of the passengers that the general emergency alarm signal is for the purpose of summoning them to their assembly or muster station (as appropriate) stations and is not a signal to abandon ship. The means by which the order to abandon ship will be given should be explained. The importance of being properly clad, of proceeding to their assembly or muster station (as appropriate) station in an orderly fashion, and of following instructions at all times should be emphasised. Where appropriate they should be advised to which type of survival craft they have been allocated, and how they will be embarked. They should be advised that only as a last resort will it be necessary to jump into the water. They should be informed of the dangers of jumping overboard, particularly from heights in excess of 6 meters and advised that if it should be necessary to jump into the water, the lifejacket must be held down with one hand and the nose protected with the other hand.

Lifejackets should be worn by passengers and crew when attending musters and drills. Crew members taking part in fire and other emergency drills may remove their lifejackets if these would be a hindrance in the execution of their duties. Where lifejackets are removed, a member of the emergency party concerned should be appointed to be responsible for these lifejackets and to ensure that they will be available for return to the members of an emergency party on completion of their relevant tasks. Where inherently buoyant lifejackets unduly hinder crew members in the execution of their duties, consideration should be given to the provision of inflatable lifejackets, although such lifejackets are not always suitable for use by members of fire hose parties due to the possibility of inadvertent activation of the automatic inflation system. Lifejackets should always be worn by members of survival craft preparation parties and at survival craft musters and drills.

On passenger ships consideration should be given to the identification of crew members, particularly those whose duties are concerned with passenger control. This can be achieved in a variety of ways, eg by the use of headgear, distinctive marking on lifejackets, loose covers worn over lifejackets, armbands, etc.

On passenger ships as many key persons as possible should carry two-way portable radios during musters and drills and such radios and any fixed two-way communication systems should be used for communications between the bridge, emergency control stations, assembly or

muster station (as appropriate) and embarkation stations, especially internal Marine Evacuation System (MES) embarkation stations. Where key persons do not have a two-way portable radio on permanent issue there should be arrangements whereby radios can be readily obtained at the outset of a drill or actual emergency. Where portable loud hailers are carried these should be used where appropriate for communicating or for simulating communicating with passengers at assembly or muster station (as appropriate) and embarkation stations. The arrangements for communication should be as recorded in muster lists and, where applicable, training manuals.

The commencement of an abandon ship drill is announced by the general emergency alarm signal. Crew and passengers, if any, should proceed to their assembly or muster station (as appropriate) stations. Crew members allocated to the handling of passengers should as appropriate clear or simulate the clearing of accommodation not used for the mustering of passengers, Marshall passengers taking part in the drill and control the flow of passengers on the stairways, in passages and doorways and guide them towards their assembly or muster station (as appropriate) stations. At the assembly or muster station (as appropriate) stations they should ensure that passengers have donned their lifejackets correctly, or give instruction in donning as appropriate, and that child lifejackets are allocated to persons of less than 32 Kg. Passengers should be advised on the matters referred to in paragraph 5.4. Where a proportion of the survival craft consists of throw over life rafts boarded by means of ship's side ladders provision should be made for allocating only able bodied passengers to these life rafts. It should also be determined that crew members know how the order to abandon ship will be announced, that they are suitably dressed and that their lifejackets have been donned correctly.

ENTRIES IN THE SAFETY DRILL RECORD BOOK

Entries in the Safety Drill Record Book shall be made on each of the following occasions.

1. Date and time of drill;
2. Position of the ship (latitude and longitude);.
3. Category of drill.
4. Short summary of the operations; and
5. Signature of the officer in charge of the operation

FREQUENCY OF DRILLS

An emergency drill shall be carried out at least once per month. The drill shall be conducted as if the emergency is existent. All equipment shall be utilized to the greatest extent possible during each drill without compromising the effectiveness of the equipment during a true emergency. This includes but is not limited to the operation of pumps, emergency breathing apparatus, lowering of life boats etc

DEBRIEFINGS

The entire ships company shall participate in a debriefing following any drill performed on the vessel. The debriefing should evaluate effectiveness of the drill overall, areas for improvement, concerns anyone may have about their responsibilities, and any comments regarding equipment, leadership, resources etc.

SHIPBOARD OIL POLLUTION EMERGENCY PLAN DRILL

SOPEP contains the following things:

- The action plan contains duty of each crew member at the time of spill, including emergency muster and actions.
- SOPEP contains the general information about the ship and the owner of the ship etc.
- Steps and procedure to contain the discharge of oil into the sea using SOPEP equipments.
- On board Reporting procedure and requirement in case of oil spill is described.

- Authorities to contact and reporting requirements in case of oil spill are listed in SOPEP. Authorities like port state control, oil clean up team etc are to be notified.
- SOPEP includes drawing of various fuel lines, along with other oil lines on board vessel with positioning of vents, save all trays etc.
- General arrangement of ship is also listed in SOPEP, which includes location of all the oil tanks with capacity, content etc.
- The location of the SOPEP locker and contents of the locker with a list of inventory.

SAFETY DRILL RECORD BOOK

NAME OF VESSEL:.....

IMO NUMBER:.....

DISTINCTIVE NUMBERS OR LETTERS:.....

PORT OF REGISTRY:.....

TYPE:.....

COVERING THE PERIOD: FROMTO.....

STEERING GEAR: TESTING AND DRILLS

Within 12 hours before departure, the ship's steering gear shall be checked and tested by the ship's crew. The test procedure shall include, where applicable, the operation of the following:

- 1 The main steering gear;
- 2 The auxiliary steering gear;
- 3 The remote steering gear control systems;
- 4 The steering positions located on the navigation bridge;
- 5 The emergency power supply;
- 6 The rudder angle indicators in relation to the actual position of the rudder;
- 7 The remote steering gear control system power failure alarms;
- 8 The steering gear power unit failure alarms; and
- 9 Automatic isolating arrangements and other automatic equipment.

The full movement of the rudder according to the required capabilities of the steering gear a visual inspection for the steering gear and its connecting linkage and the operation of the means of communication between the navigation bridge and steering gear compartment. Simple

operating instructions with a block diagram showing the change-over procedures for remote steering gear control systems and steering gear power units shall be permanently displayed on the navigation bridge and in the steering compartment. All ship's officers concerned with the operation and/or maintenance of steering gear shall be familiar with the operation of the steering

Systems fitted on the ship and with the procedures for changing from one system to another. In addition to the routine checks and tests prescribed in paragraphs 1 and 2, emergency steering drills shall take place at least once every three months in order to practice emergency steering procedures. These drills shall include direct control within the steering gear compartment, the communications procedure with the navigation bridge and, where applicable, the operation of alternative power supplies. The Administration may waive the requirements to carry out the checks and tests prescribed in paragraphs 1 and 2 for ships which regularly

engage on voyages of short duration. Such ships shall carry out these checks and tests at least once every week. The date upon which the checks and tests prescribed in paragraphs 1 and 2 are carried out and the date and details of emergency steering

Drills carried out under paragraph 4 shall be recorded.

FIRE DRILL

The purpose of carrying out any kind of drill on the ships is to make the crew acquainted with various procedures to be followed during emergency situations.

It is a way to make the ship personnel acquainted with the equipment and methods that are to be used during a crises situation.



Fire drill is one such drill which holds great importance on ships. It helps the ship's crew to understand the basics of fire prevention and also help with the following:

- To prepare the crew in dealing with an emergency situation that may arise because of a fire on board ship.
- It makes each and every crew familiar with the task he or she has to perform in case of actual emergency.
- To train the crew in using fire fighting appliances such as SCBA, different types of fire extinguishers, CO2 flooding system, Neil Robertson Stretcher, Inert Gas System, fireman's outfit, jackets, sprinkler etc.
- Helps the crew to understand the procedure to operate a particular fire fighting system and precautions that are to be taken before operating the equipment. For e.g. there are certain imperative steps that need to be carried out before starting the CO2 fire fighting system for the engine room.
- To make the crew acquainted with the location of the emergency escape routes which would be used in case of inaccessibility of a particular zone
- To familiarize the crew with company's fire and safety regulations, important points on personal safety and survival at the sea, recent safety circulars and M notices, and fire fighting appliances and preventive measures on ships

It is extremely important that the fire drill is carried out in as realistic manner as possible in order to make the crew aware of the situations that might arise during fire on ships.

IMPORTANT POINTS REGARDING FIRE DRILLS ON SHIPS

- According to the merchant shipping act, muster and drills must be according out at regular intervals of time as stated by the company and law.
- A fire drill must be conducted within 24 hours of leaving the port if more than 25% of the crew members have not taken part in the drill in the previous month.
- Muster list for the drill should be displayed throughout the ship in locations where the list can be easily accessed. The list should also be displayed at the bridge, engine room, and crew accommodation area.
- A clear fire control plan should be properly displaced in important areas throughout the ship



- Each and every crew member should be provided with clear instructions which he or she would follow during emergency. The duties of each member along with the assigned life boat number must be written on individual cards and made available inside/outside the cabin.

- The timing of the emergency drills should be changed in order to change scenarios and allow those crew members to participate who have not attended the previous drill because of duties.

- The location of the drills should also be changed to give practice to the crew in different conditions and to train them to tackle different types of fire such as machinery space fire, accommodation area fire, store room fire, cargo hold fire etc.

- The location of the muster station should be such that it is readily accessible from the accommodation and work place and is also close to the embarkation station. It should also have sufficient lights provided from emergency source.

- Each area of the ship has a different method of approach to deal with during emergency situations. Training with drills in different situations helps to prepare crew members for all types of situations.

- It is the duty of every ship personnel to get himself acquainted with the location of the emergency muster station upon joining the ship. He should also know his duties which are described in the muster list and learn how to use fire fighting appliances.

- The training manual, which contains instructions and information regarding life saving appliances and methods of survival, should be provided in each crew mess and recreation room.

- Every new crew member should be given on board training, which explains use of personal life saving appliances and survival crafts (life boats and life rafts), not later than two weeks after joining the ship.

It is important that each and every crew member performs the drill without making any mistake by memorizing his duties and understanding the importance of safety of the ship and the people on board.

MAN OVERBOARD DRILL

Regularly practice a man overboard drill procedure so that all onboard are familiar with the correct process.

The priority when a person falls overboard is alerting the crew with a cry of "man overboard".

The seriousness requires every crew member to do and use everything - including daytime orange smoke, night time white flares or strobe (flashing) lights or dye marker - to locate and rescue the person in the water.

An essential requirement is to mark the position of the man overboard with a [dan buoy assembly] with an attached whistle, life ring, flare or strobe light and sea anchor, with an assigned crew member pointing at the man overboard.

If possible, throw the life buoy assembly upwind of the casualty so that it drifts towards him.

The skipper decides on a man overboard rescue procedure, and quickly briefs the crew.



During the rescue, a spare crew should be delegated to issue a Security' call on Channel 16 on the VHF radio and activate the Mob position function on the GPS unit.

If a visual contact is lost with the victim for more than a minute, issue a Mayday call for outside assistance.

It can be cancelled if the man overboard is located.

CRASH STOP MAN OVERBOARD RECOVERY DRILL

This man overboard drill procedure keeps the boat close to the casualty for recovery of persons from the water:

The helmsman to push the tiller hard to leeward as soon as the alarm is raised.

This action this results in the boat tacking, whatever the point of sailing.

The jib sheet is left cleated as the boat tacks, with the boat ending up hove-to.

Start the engine and leave it in neutral being ready if needed.

Keep pushing the tiller to the leeward side keeping the boat stopped.

There will temporary disorder sail wise, but the boat stops and lies steadily.

This man overboard drill method works even if sailing under spinnaker but the situation will be chaotic until the spinnaker is lowered, nevertheless, the boat will be close to the man overboard. It may be close enough to the casualty to throw him a line or work the boat closer by

adjusting the sheets and tiller or lower the headsail, sheet the main in tight then use the engine to approach the person overboard.

CONVENTIONAL MAN OVERBOARD RECOVERY DRILL

The man overboard drill procedure for dinghies is taught for use in cruisers, requiring the boat to sail away from the casualty to gain sea room which has the risk of losing sight of the person. In rough conditions or at night, it is impossible to keep the casualty in sight among the waves so adopt this method for recovery of persons from the water. The boat is steered onto a beam reach for about ten boat-lengths. It is then tacked round onto a close reach bringing the boat back to the person in the water. Letting the headsail fly slows the boat down and then a heave-to to windward of the victim by letting the mainsail fly as well.

Whichever man overboard recovery drill is practiced, aim to make the final approach on a close reach allowing the adjustment of speed easily by easing or trimming the mainsail. All recovery situations require the lowering and lashing of the headsail and all ropes inboard before positioning the boat for the pickup.

SURVIVAL CRAFT DRILL

Crew members other than those who cannot be relieved from their normal duties should muster, wearing lifejackets, at their lifeboat and liferaft stations. The person in charge of each survival craft must have a list of its crew and ensure that they are fully acquainted with their duties. The second-in-command of a lifeboat must also have a list of the lifeboat crew.

On passenger ships, the lifeboats used in the drill should where practicable, include some from each side of the ship and should be distributed as to enable the crews of the other lifeboats to watch the operations. Different groups of lifeboats should be used at successive drills.

In cargo ships provided with totally enclosed lifeboats which are boarded and launched from the stowed position, drills should periodically include the boarding of a lifeboat in its stowed position in order that crew members can become practiced in boarding a boat rapidly, locating a seating position and using the seat belts.

In the case of other totally enclosed lifeboats equipped with seatbelts, crew members should be periodically drilled in using the seatbelts but such lifeboats should not be boarded at the stowed position by the full complement at any one time. When a drill is being carried out inside a totally enclosed lifeboat, crew members should also be made familiar with the launching

procedures and made aware of what to expect when the engine and air support and water spray systems, where fitted, are in operation.

Arrangements should always be made to ensure that those crew members who cannot be relieved from their duties to attend a particular drill can be relieved to attend the next drill.

On passenger ships when the drill is held at sea, a number of lifeboats should, if weather and other circumstances permit and subject to overriding safety constraints, be cleared, swung out, and lowered to embarkation deck level in the case of lifeboats boarded at this position, and



side ladders and embarkation arrangements prepared. On cargo ships at least one lifeboat should be lowered when weather and other circumstances permit.

Each lifeboat and rescue boat engine must be tested by being run ahead and astern for a total period of not less than 3 minutes provided that the engine can be safely run for this period when out of the

water and the ambient temperature is above the minimum required for starting the engine. Where lifeboats are fitted with mechanical hand-propelling gear, this gear should be examined and tested ahead and astern. Life raft davits must be swung out and winches operated. Emergency lighting for mustering and abandonment must be tested at each such drill.

In cargo ships provided with lifeboats and throw over life rafts some drills should include preparation for abandonment involving use of life rafts in conjunction with lifeboats. This may include mustering at locations other than those used for embarkation into lifeboats.

RESCUE BOAT AND EMERGENCY BOAT DRILLS

As far as is reasonable and practicable rescue boats where carried, other than those which are also lifeboats, must be launched each month with their rescue boat crews and manoeuvred in the water. The interval between such drills must not exceed 3 months. Where climatic conditions permit, the crew of a rescue boat should wear their immersion suits during such in-water drills. Where possible such drills should include the recovery of an object simulating a person in the water. Emergency boats carried on passenger ships which do not carry rescue boats should be launched at similar intervals and should carry out similar drill procedures.

In ships of Class I the crews of rescue and emergency boats should be mustered on the first day of the voyage as soon as possible after sailing. The crews should be fully instructed and drilled in their duties and thereafter should be mustered and similarly drilled at intervals of not more than 7 days. Crews should be specifically instructed in the procedure of sending boats away promptly in an emergency and in recovering boats in a seaway, and should be familiar with the signal for mustering at the rescue or emergency boat station.

DAVIT-LAUNCHED LIFERAFT ON-BOARD DRILL

On-board training in the use of davit launched life rafts must take place at intervals of not more than 4 months on every ship fitted with such life rafts. Whenever practicable this training includes the inflation and lowering of a life raft. This life raft may be a special life raft intended for training purposes only or an old life raft retained for training and not part of the ship's life-saving equipment. A special life raft intended for training purposes only is required to be conspicuously marked and, if intended to be used for boarding when swung out at the embarkation deck, should be serviced at the same intervals as the life rafts forming part of the ship's life-saving equipment.

In preparing an on-board training programmed for davit-launched life rafts the procedures adopted should take full account of the structural arrangements in way of the launching positions. For example it may not be possible to recover an inflated life raft from an over side position without subjecting it to the risk of damage. Where procedures described in paragraphs 12.3 and 12.5 cannot be safely followed, other arrangements should be made which will enable on-board training of an equivalent standard to be carried out.

In ships of Classes II and II(A) on regular voyages, the four monthly on-board training in the use of davit-launched life rafts should include an inflation of one of the ship's liferafts. These inflations should take place when in port and where practical the life raft should be lowered unloaded onto the quay rather than into the water. Training in boarding and using the release hook can be carried out when the life raft is suspended just clear of the quay. The life raft should be landed on a tarpaulin or heavy Polythene sheet to prevent any damage to the bottom of the raft. If it is not practical to land the life raft on the quay, the boarding and use of the release hook can be carried out with the life raft suspended just clear of the embarkation deck following initial inflation in the over side position. In this case the life raft need not be lowered over the side but a weight should be attached to the release hook and then lowered to exercise the winch and give crew members practice in the handling of the winch and fall.

After this training the life raft used should be sent for servicing. It is recommended that different life rafts be used at successive drills in order to avoid wear on a small number of life rafts.

In cargo ships and in passenger ships on irregular voyages, e.g. Class I cruise ships, there should be an inflation of one of the ship's life rafts at one of the four monthly on-board training sessions in the use of davit-launched life rafts. The training should be carried out as described in paragraph 12.3 and the life raft serviced as soon as possible after use. On the other two occasions in the twelve month period when the four monthly on-board training is carried out, this can be done using, for example, a practice raft and practice container. If such training is carried out in port, then the procedure described in paragraph 12.3 should be followed. If such training is carried out at sea, means should be provided for suspending and lowering the raft over a deck to provide the opportunity for boarding and handling the release hook.

Alternatively the procedure for ships engaged on regular voyages can be followed if this is more convenient.

DRILLS IN CLOSING OF DOORS, SIDE SCUTTLES AND OTHER OPENINGS

In passenger ships, drills for practicing the closing of watertight doors, deadlights, scuppers, ash-shuts, rubbish-shuts and other similar devices are required to be carried out to comply with the Merchant Shipping (Passenger Ship Construction: Ships of Classes I, II, and II(A)) Regulations 1998, or the Merchant Shipping (Passenger Ship Construction: Ships of Classes III to VI(A)) Regulations 1998. These Regulations also require inspections, at intervals of not more than 7 days, of watertight doors and mechanisms, indicators and warning devices connected with such doors, valves, the closing of which is necessary to make watertight any compartment below the margin line, and valves, the operation of which is necessary for the efficient operation of damage-control cross-connections

In all seagoing ships, with certain exceptions, the Merchant Shipping (Musters Training and Decision Support Systems) Regulations 1999 require practice fire drills to include checking of the operation of watertight doors, in the drill area.

Masters should familiarize themselves with the Regulations referred to in paragraphs 8.1 and 8.2, particularly in regard to the instruction of crew members in the safe operation of watertight doors and to those watertight doors, side scuttles, deadlights and other devices required to be securely closed before the ship proceeds to sea and to be kept securely closed while the ship is at sea.

Account should also be taken of the contents of Merchant Shipping Notice M.1326 (to be replaced by MGN 35 (M)) on the dangers associated with power operated watertight doors, and of the Instructions for the Guidance of Surveyors (Passenger Ship Construction Classes I, II and II(A)) and (Passenger Ship Construction Classes III to VIA).

ENGINE ROOM FIRE DRILLS

Accidents as a result of fire are the most common in the ship's engine room. Fire drills, which must include fire fighters from both deck and engine sides, are to be carried out frequently to ensure that the ship's crew is well prepared for any such adverse condition. Fire drills must be performed at various levels and machinery of engine room i.e. Boiler, Generator, Purifier, Main Engine.

ENGINE ROOM FLOODING DRILL

A delayed action during engine room flooding can lead to loss of important machinery such as generators, main engine etc., leading to complete blackout of the ship. Engine room flooding response training and immediate repair actions must be taught to engine crew. The flooding training must include response actions to different emergency situations such as grounding, collision etc. which can lead to structural damage and flooding of water in the engine room.



Engine room flooding as the name indicates, means filling up of the engine room space with water. Engine room flooding can affect the water tight integrity of ship. In this article we will find out what are the main reasons for engine room flooding what has to be done in case of engine room flooding.

The engine room flooding can take place due to mainly three reasons:

LEAKAGE FROM EQUIPMENT AND SYSTEM

Engine room flooding can take place due to leakage in the engine room space from machinery or sea or fresh water system. Leakages can generally be from big sea water pump, from sea water or fresh water cooler, leakage from boiler feed water system etc. The leak can also take place from any of the fresh or sea water pipeline due to which a lot of water can enter the engine room space. Leakage of any ballast water tank in the double bottom of the engine room, leakage from manhole, or crack in the water tank can also lead to engine room flooding.

Sea water or fresh water piping and system of the engine room are huge in size and thus hold large possibility for leakages.

ACTION TO BE TAKEN IN SUCH SITUATIONS

- Call for maximum man power to tackle the situation.
- The sooner you find the fault the better.
- Start the other circulating system and isolate the leaking pump, pipe, cooler etc.
- Close inlet and outlet valves of the effected system to stop the leak.
- Inform chief engineer regarding the leak and follow the instruction from him.
- Put a notice or placard regarding leaking equipment or system and trip the breaker until repairs has been done.
- In case of any tank leakage, start transferring the excess content from that tank to other tank and try to minimize it as much as possible.
- Tank should not be used until cement box or welding has taken place or a repair has been done.

IN CASE OF LEAKAGE FROM OVERBOARD VALVE

- If the Leakage is after the valve and if the valve is holding shut the valve if the system involved for that valve permits normal operation of the ship with the valve closed.
- If the valve is not holding then identify the leak. It may be from the valve stem gland or flange joint; try to repair the leak.

– If system for that valve can be isolated without disturbing the normal operation of the ship, put a blank in the valve.

– If the repair is temporary then when ship reaches the port, call the divers to blank the valve opening from outside and carry out permanent repair.

FLOODING DUE TO CRACK IN THE HULL OR SMALL HOLE IN THE HULL

– In this case, as soon as you find the leak, call for help from nearest coastal state because if the leakage is more, the ship's stability will be affected.

– By all means, the leakage has to be minimized and finally stopped.

– If the leak is not big enough, then cement box is to be put in place of the leak and repairs are to be done accordingly.

– In case of leakage due to damage from any accident like collision or grounding, there is nothing much that can be done as the opening in the bulkhead is large and there is no chance of stopping the leak. In such cases, the captain has to decide whether the ship is safe place to stay or not and decision for abandoning the ship has to be made.

– In case of abandon ship signal being announced, the crew should muster to their respective lifeboat and abandon ship operation should be carried out.

For any of the above reasons, if the water level ingress in the engine room is very high, then open the emergency bilge ejector valve with consent of the chief engineer and pump out the water overboard. Entry of the same is to be made in Oil record book (ORB) with date, time, and position of the ship and reason of direct discharge with signature of officer involved in operation, chief engineer, and master should be registered.

Chief engineer has to be reported immediately in such condition without any delay.

ENCLOSED SPACE DRILL

Engine room comprises of several tanks and confined spaces which are unsafe to enter without preparation and permission. Enclosed space training with risk assessment and dedicated check lists must be carried out for all ship's crew.

A ship is a complex structure from inside with several small and enclosed spaces. Many of these enclosed spaces are used for installing some machinery or for storing machine parts or workshop equipments. A ship has a matrix of pipelines which runs through each of its parts, including enclosed spaces.

But that is not the point of discussion here. An enclosed place can be used for several reasons; however, the main issue arises when one has to enter these enclosed places in order to do some repairing work or for cleaning purposes.

Because of zero ventilation, these enclosed places generate and store toxic gases which



are either produced from chemicals stored in the place or leakage from pipelines. If a person enters such place without taking precaution, he or she may suffer unconsciousness and sometimes even death.

In order to prevent such unfortunate circumstances there is a proper procedure that needs to be followed for safety and wellness of the person entering the enclosed space.

PROCEDURE FOR ENTERING AN ENCLOSED SPACE

The following are the points that need to be followed before entering an enclosed space:

- Risk assessment to be carried out by a competent officer as enclosed or confined space entry is deficient in oxygen, making it a potential life hazard.
- A list of work to be done should be made for the ease of assessment for e.g. if welding to be carried out or some pipe replacement etc. This helps in carrying out the work quickly and easily.
- Risk assessment also needs to be carried out. Risk assessment includes what work to be done, rescue operation etc.
- Potential hazards are to be identified such as presence of toxic gases.

- ÿ Opening and securing has to be done and precaution should be taken to check if the opening of enclosed space is pressurized or not.
- ÿ All fire hazard possibilities should be minimized if hot work is to be carried out. This can be done by emptying the fuel tank or chemical tank nearby the hot work place.
- ÿ The confined space has to be well ventilated before entering.
- ÿ The space has to be checked for oxygen content and other gas content with the help of oxygen analyzer and gas detector.
- ÿ The oxygen content should read 20% by volume. Percentage less than that is not acceptable and more time for ventilation should be given in such circumstances.
- ÿ Enough lighting and illumination should be present in the enclosed space before entering.
- ÿ A proper permit to work has to be filled out and checklist to be checked so as to prevent any accident which can endanger life.
- ÿ Permit to work is to be valid only for a certain time period. If time period expires then again new permit is to be issued and checklist is to be filled out.
- ÿ Permit to work has to be checked and permitted by the Master of the ship in order to work in confined space.
- ÿ Proper signs and Men at work sign boards should be provided at required places so that person should not start any equipment, machinery or any operation in the confined space endangering life of the people working.
- ÿ Duty officer has to be informed before entering the enclosed space.
- ÿ The checklist has to be signed by the person involved in entry and also by a competent officer.
- ÿ One person always has to be kept standby to communicate with the person inside the space.
- ÿ The person may also carry a life line with him inside.
- ÿ The person should carry oxygen analyzer with him inside the enclosed space and it should be on all the time to monitor the oxygen content. As soon as level drops, the analyzer should sound alarm and the space should be evacuated quickly without any delay.
- ÿ No source of ignition has to be taken inside unless the Master or competent officer is satisfied.
- ÿ The number of persons entering should be constrained to the adequate number of persons who are actually needed inside for work.

- The rescue and resuscitation equipment are to be present outside the confined space. Rescue equipment includes breathing air apparatus and spare charge bottles.
- Means of hoisting an incapacitated person should be available.
- After finishing the work and when the person is out of the enclosed space, the after work checklist has to be filled.
- The permit to work has to be closed after this

The above mentioned procedure is extremely important to entering an enclosed space. These points are imperative to risk any crew member's life while entering a confined space.

SCAVENGE FIRE DRILL

All engine room crew members must know engine scavenge fire fighting procedure. The crew must know about the system that is to be employed for scavenge fire fighting along with the precautions that are to be taken before implementing particular method to the engine. (For e.g. if steam is used to suppress the fire, the line should be drained before steam insertion as water in the line may lead to thermal cracks of engine parts).

One of the most common reasons for a fire in a ship's engine room, scavenge fire is the deadliest of all fires. Scavenge fire has been the reason for several major accidents on ships in the past and it is for this reason that it is termed as the most dangerous cause for accidents on a ship.

In order to understand scavenge fire it is important to learn the basics. In this article we have brought to you everything you ever wanted to know about scavenge fires – from causes to actions. Understand and fight scavenges fires the way it should be.

GETTING THE BASICS RIGHT: WHAT IS SCAVENGE FIRE?

For any fire to occur we need three elements which make the fire triangle. The three important elements for any type of fire are:-

1. OXYGEN –this is available plenty in the scavenge space.
2. HEAT SOURCE- this could happen because of blowing by of gases between piston rings and liner or as a result of any rubbing between two surfaces.

3. FUEL- this can be from un-burnt fuel, carbon or cylinder lubricating oil leaked into the space

When all these elements are present in a proportion ratio and lie within the flammable limit inside the scavenge space they later become a hot spot for eruption of fire. The fire which thus results is known as the scavenge fire.

CAUSES OF SCAVENGE FIRE

There are many reasons for scavenge fire. However, the main ones are as below:

1. Excessive wear of the liner.
2. The piston rings might be worn out or have loose ring grooves.
3. Broken piston rings or rings seized in the grooves.
4. Dirty scavenge space.
5. Poor combustion due to leaking fuel valves or improper timing.
6. Insufficient or excess cylinder lubrication.

INDICATIONS OF SCAVENGE FIRE

There are a few signs which indicate a scavenge fire. One should be extremely cautious in case any of the below mentioned conditions are observed.

1. Scavenge temperature will start increasing.
2. The turbochargers will start surging.
3. High exhaust temperature.
4. Loss of engine power and reduction in rpm. This happens because a back pressure is created under the piston space due to fire.
5. Smoke coming out of the scavenge drains.
6. The paint blisters will be formed on the scavenge doors due to high temperature but this will occur only in large fires and extreme cases.

ACTIONS TO BE TAKEN

Action taken in case of a scavenge fire depends on the type of the fire, whether small or large. In case of large fire the following signs will be easily visible – the peeling or blistering of paint, large reduction in engine rpm and surging of turbocharger.

FOR SMALL FIRES

1. Start reducing the engine rpm and reduce it to slow or dead slow.
2. Increase the cylinder lubrication of the affected unit. Special attention to be given for this as this does not feed the fire. In case of increase of fire do not increase the lubrication.
3. The fire can be due to leaky fuel valves, so lift up the pump of the affected unit.
4. Keep scavenge drain closed.
5. Keep monitoring the scavenge and exhaust temperatures and let the fire starve and wait for it to burn itself out.
6. After confirming that the fire is out start increasing the rpm slowly.
7. Keep monitoring the scavenge temperature for any signs of re-ignition.

FOR LARGE FIRES

1. Stop the engine immediately and engage turning gear, and keep engine rotating with turning gear.
2. Extinguish the fire with fixed fighting system for scavenge fire. This may be co2 system or a steam connection for smothering the fire.
3. In case fixed system is not available on very old ships an external cooling is provided to prevent distortion due to heat.

4. Once after confirming that the fire is extinguished. The scavenge space is allowed to cool down and later opened for inspection and cleaning of the scavenge space.

CRANKCASE EXPLOSION DRILL

Crankcase explosion in the ship's engine can lead to fatal situations and heavy loss of ship's property. The crew should be prepared for taking the right action when the engine's oil mist detector gives an alarm.

Ships when at sea carry massive amount of fuel, diesel, and lubricating oils in their fuel tanks. These oils are used for running the ship's machinery, which eventually drives the ship. This huge quantity of fuel on the ship is a ticking bomb which might result in massive explosions and disaster if proper precautions are not taken.

However, it's not just the fuel tanks that are probable source of fire and explosions but even the machinery that uses fuels. In this article we will learn about one such explosion, which is supposed to be known as the most disastrous explosion and one which takes place in the ship's main engine. It is called the crankcase explosion

CAUSES OF CRANKCASE EXPLOSION

As we all know, for a fire or explosion to take place, there are three basic elements that are required to complete the fire triangle. These three components are – heat/energy, oxygen and fuel. In the presence of allthesethree elements, in proportional ratio and within the flammable limits, the reaction which causes fire or explosion becomes cyclic.

In the crankcase of the main engine, the oil particles are churned into small particles of up to 200 micro meters in diameter. These small particles cannot ignite readily even with some naked flame. If a hot spot comes in contact with these small particles, it reduces the size of these particles, resulting in the formation of mist, which can be readily ignited with a hot spot.

In the crankcase of the main engine all the three elements required for fire are available. Lubricating oil as the fuel source is sufficiently present, the air as one of the three things necessary is also present and the heat or energy is produced from a hot spot. Thus a crankcase is the most vulnerable spot for explosions as all the three factors required are available in abundance.

WHAT IS A HOT SPOT?

Hot spot is nothing but the heat source produced as a result of rubbing between two metal surfaces or friction between two metals parts such as piston rod and gland, cross head guides, chain and gear drive etc. The hot spot is generally caused by improper maintenance and insufficient or less clearance.

When the oil comes in contact with the hot spot, these oil particles vaporize and smaller particles are formed. These particles move towards the colder region inside the crankcase space and when in contact with the cold region, form a white mist. Over a period of time the formation of mist starts increasing and when sufficient air/fuel ratio is reached i.e. high enough to exceed the lower explosion limit, the mist comes in contact with the hot spot again and in the presence of sufficient temperature results into an explosion.

The extent of explosion will depend upon the amount of mist produced inside. The primary explosion might be mild and sufficient enough to lift the crankcase relief valves but there could be more severe and dangerous effects during secondary explosion.

SECONDARY EXPLOSION

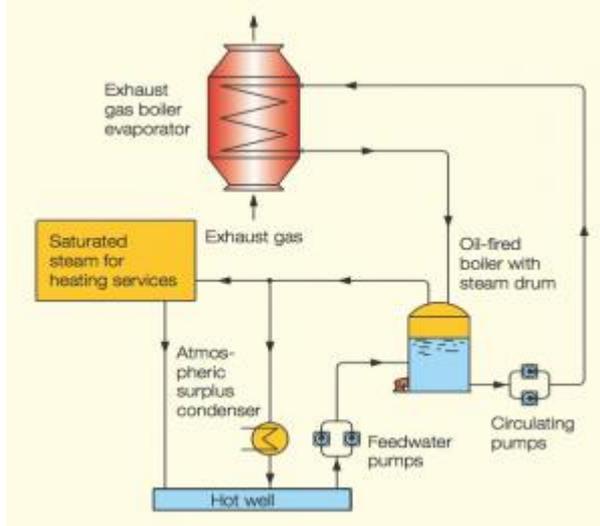
The primary explosion produces a shock wave which propagates inside the crankcase with increasing speed and distance traveled. This shock wave has a breaking effect which further reduces the size of oil droplets, producing more fuel for ignition. Now the pressure front is followed with a low pressure area which tries to suck in more air from outside. This allows the air to enter in the scavenge space through leaky piston gland or leaky relief valves.

This new air and new supply of fuel produced after first explosion comes in contact with hot spot, causing another explosion, which is extremely severe as the amount of fuel is high now. This explosion is known as secondary explosion and it causes very severe damage to engine plating. Crankcase explosions have been a result for the loss of several lives of people in the past.

Thus proper maintenance and checks is the key to prevent such explosion.

UPTAKE FIRE DRILL

Engine crew to be well trained by frequent drills on how to fight boiler uptake fire. Crew should be trained in various stages of uptake fire and different procedures to fight these fires.



An Exhaust Gas Boiler is a type of heat recovering system on ships which allows the exhaust heat of the main engine to produce steam while going out in the atmosphere.

Every system, which is operated at high temperature, always has a risk of fire. This applies to EGB which has the inlet temperature of exhaust gases @ 300-400 deg. C. The most

common type of Exhaust Gas Boiler (EGB) used on ships are water tube boilers.

In water tube type of arrangement, the water passes through tube stack, which is arranged in the path of exhaust gas inside the exhaust gas trunking of the main engine. The exhaust gas flows over the tube stacks and heats the water, thus producing steam.

The main constituent of the soot deposit is particulates but in addition, some unburnt residues of fuel and lubricating oils may be deposited in the boiler.

Soot deposit and fire in the EGB can be-

1. Due to the poor combustion of fuel in the main engine
2. Due to prolong slow steaming
3. Long maneuvering of the ship
4. Frequent starting and stopping of the engine
5. Poor grade of fuel oil/ cylinder oil
6. Low exhaust gas velocity passing the EGB
7. Low water inlet velocity in the water tubes
8. Low circulation water flow ratio

TYPES OF EXHAUST GAS / SOOT FIRE IN THE EXHAUST GAS BOILER (EGB)

For a better understanding, it is better to distinguish the EGB fire in stages rather than in types. EGB fires can be differentiated in two or three stages depending upon the intensity of fire.

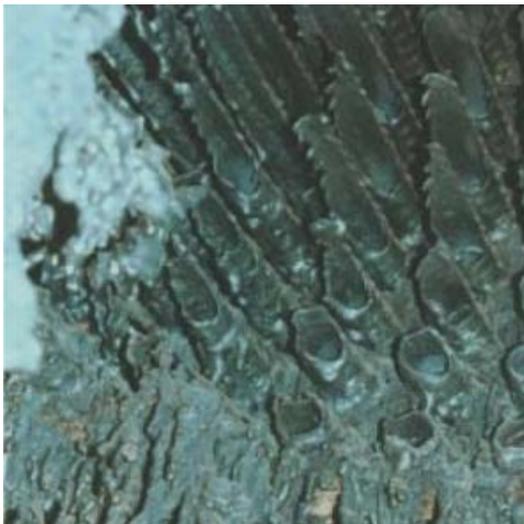
Soot is deposited in the water tube of the exhaust boiler. When the ship is at slow speed, the exhaust temperature of main engine may vary from 100 to 200 deg C. This temperature is enough to ignite “wet soot” whose ignition temperature is around 150 deg. C.

If the soot is “dry”, it will not get ignited at such low temperature (150 deg. C) but when the engine is running at higher speed and the temperature of gases reaches to above 300 deg. C, then in the presence of excess oxygen the deposits of combustible materials will liberate sufficient vapor, which can be ignited by a spark or a flame.

The above soot fires are called small or normal soot fire because the heat energy is conducted away by the circulating boiler water and steam. Also the sparks remain inside the funnel or diminish while passing through the flame arrestor in the funnel top.

HYDROGEN FIRE

Hydrogen fire in a EGB occurs when the chemical reaction of dissociation of water takes place at a temperature above 1000 deg. C. This leads to formation of Hydrogen (H₂) and Carbon monoxide (CO) which are both combustible in nature.



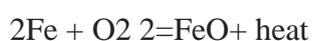
$2\text{H}_2\text{O} = 2\text{H}_2 + \text{O}_2$ (Dissociation of water
Leading to formation of hydrogen-H₂)

$\text{H}_2\text{O} + \text{C} = \text{H}_2 + \text{CO}$ (Reaction of water
with carbon deposit leading to formation of carbon
monoxide-CO)

IRON FIRE

At this stage, the chain reaction of oxidation of iron metal starts at a high temperature of 1100 deg. C which means at

such high temperature the tube will start burning itself, leading to complete meltdown of tube stacks.



It is strictly advisable not to use water or steam at this stage to fight the fire because the overheated iron will react with water to continue this reaction.



STEPS FOR PREVENTION OF FIRE

- Avoid slow steaming of main engine
- Ensure good fuel combustion in the main engine
- Ensure fuel is treated and is of good quality while supplying to the engine
- Do regular soot blow of boiler tubes
- Do water washing in ports at regular interval
- Ensure design of exhaust trunk to be such to provide uniform heat to complete tube stack
- Pre-heated circulating water to be supplied to boiler mainly at the time of start up
- Circulating pump should not be turn off at any time while main engine is running
- Do not stop circulating pump for at least two hours after the main engine is stopped
- Start circulating pump prior to 2 hours before starting the main engine

HOW TO TACKLE EGB FIRE?

The response for tackling EGB fire will be different for different stages.

When there is stage 1 fire, i.e. normal soot fire:

- a) Stop the main engine, and thereby the oxygen supply to the fire
- b) Continue operating the water-circulating pump. Never stop the pump
- c) Never use soot blowers for fire fighting whatever type it is – Steam or Air as both will accelerate the effect of fire
- d) Ensure all the exhaust valves in the stopped Main engine are in closed position so as to cut any chance of air supply to the soot fire
- e) Cover the filter of turbocharger
- f) Water washing, if fitted, may be used to extinguish the fire. This is normally connected to the ship's fire fighting water system

g) External boundary cooling can be done

FOR MAJOR FIRE:

- a) Stop the main engine, if it is not stopped already
- b) Stop the circulating water pump.
- c) Shut all the inlet and outlet valves on the water circulation line
- d) Discharge the (remaining) water from the exhaust gas boiler sections by draining
- e) Cool down with plenty of splash water directly on the heart of the fire (Take care not to splash water in other parts as water can accelerate the reaction)

Section 4: Drills

◇ **Fire Drill:**

Initial notifications	Familiarity with duties	Space isolation
General alarms / signals	Familiarity with equipment	Smoke control
Crew response	Fire pumps started	Communications w/ bridge
Properly dressed / equipped	Two jets of water	
Language understood by crew (SOLAS 74/78 III/18.3; MSM Vol. II/D5.C.7.i; NVIC 6-91)	Fire doors and dampers	

Location: _____ Time on Scene: _____

Notes: _____

◇ **Abandon Ship Drill:**

General alarms / signals	Familiarity with duties	Boat operation
Muster lists	Provide equipment	Egress procedures
Muster of crew	Familiarity with equipment	Davit-launched liferaft drill
Crew response	Lower lifeboat	Communication w/ bridge
Language understood by crew	Brake operation	Lighting
Lifejackets	Engine start	

(SOLAS 74/78 III/18.3; MSM Vol. II/D5.C.7.h)

Location: _____ Time to Water: _____

Notes: _____

BLACKOUT DRILL.

Blackout is one condition each and every mariner is familiar with and also afraid of. It is one situation everyone on the ship is terrified of because it brings the whole ship to a standstill. From bridge to engine room, from dinning crew members to the sleeping ones, everyone is affected by a blackout.

If you are the one working in the engine room, then a blackout condition is your responsibility and you should be responsible for the same, sooner or later the blame is going to come on you. In this article we will learn what are the first things that need to be done in case of blackout condition on a ship?

Blackout condition is a scenario on a ship, wherein the main propulsion plant and associate machinery such as boiler, purifier and other auxiliaries stop operating due to failure of power generation system of the ship – Generator and alternator. With technologies and automation, measures are provided to avoid such blackout situation by means of auto load sharing system and auto standby system in which the generator set that is running in parallel or standby comes on load automatically if the running diesel generator fails.

WHAT TO DO IN CASE OF A BLACKOUT?

In case of Blackout following precautions and actions should be taken:-

- Never panic in such situation, be calm and composed. Emergency generator will restore the power in no time.
- Inform Officer on bridge briefly about the condition.
- Call for man power and inform the chief engineer.
- If the main propulsion plant is running, bring the fuel lever to zero position.
- Close the feed of the running purifier to avoid overflow and wastage of fuel.
- If auxiliary boiler was running, shut the main steam stop valve to maintain the steam pressure.
- Find out the problem and reason for blackout and rectify the same.
- Before starting the generator set, start the pre- lubrication priming pump if the supply for the same is given from the emergency generator; if not, then use manual priming handle (provided in some generator).
- Start the generator and take it on load. Then immediately start the main engine lube oil pump and main engine jacket water pump.
- Reset breakers and start all the other required machinery and system. Reset breakers that are included in preferential tripping sequence. (Non-essential machinery).
- It requires both skill and patience to tackle a situation like blackout specially when the vessel is sailing or maneuvering. However, the best way to tackle such situations is to be calm and composed; and to know your engine room and machinery very well in advance.

DRILLS ON CRUISE SHIPS, CARGO SHIPS, TANKERS

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