



Fire safety onboard ships – a continuous cause for concern

Fuel leaks and oil soaked insulation in engine rooms, clogged nozzles of fixed fire extinguishing systems, malfunctioning fire water pumps, holes in ventilation ducts... The list of unacceptable fire safety systems and arrangements observed during port state control inspections is long - and more worrying, it does not change much from one year to another.

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Recurring fire safety deficiencies

In April 2022, the US Coast Guard released its Port State Control (PSC) Annual Report 2021. Like most years, findings related to inadequate fire safety systems and arrangements on board visiting ships top the PSC's list of causes for detainable deficiencies.

It is a requirement of SOLAS Reg. II-2/14 that all fire protection equipment shall be kept in good order and readily available for use. It is also a requirement of SOLAS Reg. I/11 that any defects which affect the safety of the ship or its continued compliance with statutory requirements are to be reported to class and the flag administration. A ship is only detained when it is considered unfit to proceed to sea or the identified defects pose an unreasonable risk to the ship, its crew or the environment. Below are examples of some of the most common detainable fire safety deficiencies reported by the US PSC Officers (PSCO) during the last five years.

- Fuel oil leaks, oil-soaked insulation/lagging, excessive amounts of oil in engine room bilges, quick-closing valves on fuel and lube oil tanks being disabled in the open position, etc. – all evidence of poor engine room maintenance and housekeeping procedures.
- Disconnected or inoperable fire detectors. There are even reports of smoke detectors covered with plastic bags, and standard battery-operated household smoke detectors being the only source for fire detection in the accommodation spaces.
- Breach of structural fire protection barriers, including defect fire doors, inoperable fire dampers, and damaged ventilation ducting.
- Inoperable fixed fire-extinguishing systems, e.g. due to a discharge valve being set in the wrong/closed position or spray nozzles that are clogged by dirt and debris. On one occasion, rags were found to have been stuffed into all of the sprinkler heads in a ship's paint store.
- Malfunctioning fire pumps, delivering less pressure or amounts of water than what is required, and fire hoses that are damaged or dry rotted.
- Portable fire extinguishers with little or no pressure in the cylinders.

The US Coast Guard's PSC Annual Reports from 1998 to the present are available [HERE](#).

Frequency of ship fires is not improving

Every year fires on board ships lead to loss of lives and severe damage to the ships themselves. Despite the fact that great attention is paid to fire safety, not only through PSC inspections but also during the design, construction and operation of ships, the overall frequency of ship fires is not improving.

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According to the Nordic Association of Marine Insurer's (Cefor) Annual Report 2021, the frequency of most types of casualties are showing a downward trend - except for

fires. Although cargo related fires on board container vessels and car/Ro-Ro vessels have been a frequent topic of discussion in the industry in recent years, the majority of fires on board ships still originate in the engine room. In short, the Cefor report identifies that:

- The frequency of fires has hovered around the same average level for years. And, while the frequency of fires may be low compared to for example machinery or navigation related claims, fires tend to result in very costly claims because of their serious consequences.
- The highest fire frequency can be observed on car/Ro-Ro, container, and passenger vessels, and these are often very expensive incidents.
- Fires on container vessels continue to increase, and the risk of fires in the cargo area of such vessels increases with the size of the vessel. However, the overall fire frequency for container vessels is also heavily impacted by engine room fires. In fact, the frequency of fires in the engine room of container vessels was almost three times higher than the frequency of fires in their cargo areas in 2020-2021.

The Cefor Annual Report 2021, as well as detailed NoMIS reports for ocean and coastal hull business, are available for download [HERE](#).

The good news is that suggestions to review and improve regulatory fire safety measures on container and car/Ro-Ro vessels have now made it onto the agenda of the IMO Maritime Safety Committee (MSC). It is also worth noting that the high number of fires in engine rooms caused by leaks from low pressure fuel oil systems in combination with hot surfaces has been an important focus area for Cefor since 2017, see [Technical Forum Memo No.6](#). This concern has also been raised with the classification societies/IACS and discussions on possible measures to reduce the risk of such fires is ongoing.

Good procedures, training and awareness remain key

The safety of a ship and its crew ultimately depends upon good design and the operator and crew's training and focus on fire prevention measures. Companies must therefore bear in mind that, although compliance with fire safety requirements is controlled by authorities and classification societies, it is the company's responsibility to establish procedures to ensure that the ship is maintained in compliance with the provisions of the relevant rules and regulations (ISM Code Ch.10) and that the crew is properly trained and provided with adequate resources/tools to perform their tasks in accordance with the required standards (ISM Code Ch.6 and Ch.3 respectively).

In Gard's experience, the risks are often at their highest when maintenance work is taking place or immediately thereafter. The risks involved in the execution of a specific repair or maintenance operation are not always readily identifiable and are sometimes underestimated due to the perceived simplicity of the work to be carried out. As a result, additional safety precautions may not be considered necessary during and after the repair work. Typical examples are missing hot-work permits and the absence of a fire watch. Following a period of maintenance, the time available to prepare the vessel and get her back in operation can be limited. The refitting of removed insulation mats or spray shields in the engine room, for example, is often left for the crew to complete during the voyage.

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Major fires have arisen because of a failure to recognise potential fire hazards, and above all, the best fire prevention is a well-trained crew. Training and experience transfer between crew should aim to create a mutual understanding of all fire hazards present on board and their potential consequences. Remember, ordinary seafarers may have to deal with fire incidents that would challenge even the most experienced of fire-fighters.

Gard publications on shipboard fires

- Loss Prevention poster:

[Firefighting_LowRes.pdf](#)

- Case study:

[Gard%20Case%20study%20-%20engine%20room%20fire%20and%20failure%20of%20fire%20fighting%20systems.pdf](#)

- Case study:

[Gard%20AS%20-%20Case%20study%20-%20engine%20room%20fire.pdf](#)

- Case study:

[Gard%20-%20Case%20study%20%20-%20use%20of%20fixed%20and%20portable%20fire%20extinguishers.pdf](#)

- Presentation on shipboard fires (2019):

[Fire%20feeds%20on%20negligent%20deeds.pdf](#)

- [A delayed response to a fire can be fatal for the fire team](#)
- [Inoperative water mist systems - a frequent cause of detentions](#)
- [Gard%20LPC%20Fire%20prevention%20in%20engine%20rooms.pdf](#)
- [Facing the challenge of fire at sea](#)
- [Fire safety in the engine room](#)
- [Container ship fires: Gard conference promotes the value of industry collaboration](#)
- [Challenging the SOLAS fire regulations for container vessels](#)
- [Containership fires - keeping up the pressure for change](#)

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