

## The dangers of hot work on cargo securings

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### Introduction

Gard has seen a spate of incidents where ship fires have resulted from hot work on cargo securings. Most cases involved project/heavy lift cargoes, which often require additional securings to be fitted on the vessel to deal with the expected additional forces. In some instances, the cargo itself, or its framework, may be welded directly to the ship. In a recent case it was found that the ship's crew had inadvertently started a fire in the cargo hold while using oxy-acetylene cutting equipment to remove steel brackets from the hatch cover. The brackets had been used to secure a heavy lift cargo on the hatch cover.

### Gard's experience

Gard's experience is that fires have resulted from hot work performed by both ship's crew and shore contractors. On the one hand, shore contractors may not be fully familiar with the fire risks onboard a ship and on the other, the ship's crew may not be fully competent to operate the hot work equipment. In spite of all the available forms and checklists, procedures are still not always followed. In Gard's experience most fires have occurred when fixtures have been removed to discharge the cargo or to return the ship to its previous state. Many cases have involved hot work on deck with sparks and molten metal falling into cargo spaces below.

### Guidance to the crew

The ship's safety management system should provide guidance to the crew on hot work operations. Regardless of who is to perform the work, the following factors are worth bearing in mind:

A *risk assessment* should be undertaken by a ship's officer in charge of the hot work operation; identifying all hazards, however remote, enabling the necessary precautions to be taken. Consideration should be given to the best time and place to perform the hot work, preferably when fire risks can be minimised and fire response capabilities are optimal. For example, it would be prudent to defer hot work on deck until completion of discharge of hold cargo alongside the berth, especially if cargo is dangerous or highly combustible. If sparks fall into a loaded cargo hold, they can find their way into a part of the stow where fire detection and fire fighting is extremely difficult. One of the critical points which should not be overlooked is the heat generated by hot work.

A *Permit to Work* should be carried out by the officer in charge of the hot work and reference should be made to the risk assessment for any additional precautions to be taken. A hot work permit will often be required by the shore authorities and must be obtained as they may require specific precautions to be taken. However, a permit does not relieve the ship of responsibility to take the necessary precautions onboard.

The *officer in charge* should be completely satisfied as to the competence of the person(s) performing the hot work and using the equipment – a number of fires have been caused by holes cut through to adjacent spaces. A tool box meeting led by the officer in charge and involving all individuals with a role in the hot work operation should be held before the work is commenced. Only once the officer is satisfied that all parties, particularly non-crew members, understand the hazards, precautions and emergency procedures involved should the Permit to Work be signed off by all participants.

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In terms of precautions to be taken, particular attention should be paid to the following<sup>1</sup> :

1. The fire hazards in the immediate vicinity or adjacent spaces, especially those not immediately apparent, e.g. combustible gases/vapours.
2. Hot work should be prohibited in the vicinity of tanks or vents to tanks containing flammable liquids/residues, unless completely gas freed.
3. If combustible material cannot be removed from the cargo being secured, the immediate vicinity or adjacent spaces, it should be shielded, preferably with fire retardant material.
4. The need for a constant fire watch in the vicinity of the work and in all adjacent spaces, bearing in mind that sparks can travel some distance and fall into openings which cannot be closed. Screens should be used to confine spark spray. A generous application of water will be needed to cool down the surfaces/molten metal. Having a good fire watch means that the early application of water on the hot sparks/slag/surfaces can prevent the fire spreading.
5. The need to continuously supervise the individuals performing the hot work to ensure that they do not undertake any hot work outside the permitted area where precautions may not yet be in place. If supervision is interrupted the works should be suspended.
6. The need for good communication between the fire watch and the officer in charge.
7. The immediate readiness of fire fighting appliances, such as extinguishers and charged hoses which should be laid out, and be positioned close to hot work and within easy reach for those on fire watch, even in adjacent spaces.
8. Fire detection, alarm systems and fixed fire fighting systems must have undergone recent testing.
9. The need to maintain a fire watch for at least two hours after the hot work has been completed.

### **Recommendations**

A risk assessment should be undertaken by a ship's officer in charge of the hot work operation. The Master should never allow welding in cargo compartments where cargo is already loaded without all necessary precautions having been taken and the operation being continuously monitored by a responsible and competent person. Following completion of the welding work, a fire watch must be maintained to monitor the situation and prevent any subsequent outbreak of fire.

Charterers as well as owners need to be aware of the dangers of hot work, as the charterer may be contractually responsible for stowage/securing of the cargo under the charterparty.

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<sup>1</sup> The guidelines to the crew are general yet useful and should not in any way conflict with company procedures or policy.

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