

## Hot Work

### Understanding the Risk

Inadequately controlled hot work can result in a serious fire.

The risks associated with hot work arise from the potential of a fire to start and develop in combustible materials that may be some distance from the where the hot work is taking place.

Hot work can be described as any operation that results in the emission of concentrated sources of heat such as sparks or molten metal. Examples include welding, brazing, cutting, grinding, paint stripping and torch applied roofing.

### Related Loss Statistics

During the 2009-2016 period, 346 fires were recorded on the Fire Protection Association (FPA) database that were attributed directly to hot work, with a cost of £64m.

Fires starting in roof areas or other restricted spaces are difficult to bring under control and can result in significant property damage. It is frequently in such areas where hot work is carried out.

### Controlling the hazard

Where possible, temporary hot work should be avoided and not be performed within the premises.

If hot work is a common occurrence, a designated hot work workshop should be established. Such an area must be of non-combustible construction, well segregated, clear of combustibles, suitably designed for hot work and must be regularly inspected.



For hot work that cannot be carried out in a designated workshop, additional procedures will be required controlled by an effective hot work permit.

A hot work procedure imposes a formal system requiring specific actions in order to remove unsafe conditions and to minimize human element mistakes.

Vital to the success of a hot work procedure is the appointment of a responsible person or persons such as the fire safety supervisor. This person must be suitably trained and qualified to assess, agree and monitor hot work operations and to issue hot work permits.

Appointed persons need to be aware of other work taking place on site that may impact on or be impacted by any planned task. They must have the authority to refuse requests to carry out hot work and to stop hot work operations if required.

Prior to agreeing the work, the appointed person must determine if hot work is the only option. Hot work should not be carried out if alternative, safer means of completing the job are available.

## Hot work procedure

If it is deemed that in situ hot work is essential, a hot work procedure needs to be followed in conjunction with other interested parties such as the landlord of the property.

### Risk Assessment

Initial assessments of the work to be completed must be carried out in the form of a risk assessment. The assessment needs to consider what could go wrong in the worst case scenario and must establish the effect this could have on site operations.

The nature of hot works means that a fire can be started outside the immediate area where work is being carried out. The assessment needs to consider the environment in which the work is to be conducted and needs to establish that it is safe to continue.

Hot work is often associated with work on metal vessels and containers that may have contained flammable materials or have been under pressure. Vessels that have contained flammable materials must be purged prior to the commencement of hot work. Hot work must not be allowed in explosive or flammable atmospheres or on pressurised site.

Where construction materials are unknown, the worst case must be assumed. Hot work should not take place on insulated panels or where the cores of such panels are exposed.

### Contractors

If a contractor is to perform the hot work, it is imperative they understand and abide by site systems, procedures and rules. In advance of work commencing, a check must be made of their insurance certificates and the test certificates relating to their equipment.

### Fire Detection and Suppression Systems

Fire detection systems may need to be isolated to prevent false activations. Only individual detectors in the vicinity of the work should be isolated. An activation outside of these areas suggests smoke has spread beyond the area anticipated by the risk assessment and therefore suggests hidden fire spread.

Sprinkler systems should remain active throughout hot work whenever possible.

All isolated fire detection and suppression systems need to be fully reinstated on completion of the work.

### Fire Watch

For all operations, a fire watch will be needed to react to any fires that may start outside the field of view of the operator, for example if there are nearby walls or if elevated work is being carried out.

The person appointed as the fire watch needs to be suitably trained in what to look out for and what actions to take if a dangerous situation occurs. This will include raising the alarm and tackling a fire if deemed safe to do so. The fire watch period must be continuous, including during rest breaks. Fully charged fire extinguishers suitable for the environment must be provided.

### Work Area

Sparks and other hot emissions can commonly spread a horizontal distance of 10m from the area of work, with this distance increased if work is carried out in an elevated position or if there are strong air currents.

Precautions include clearing all storage within a minimum radius of 10m around the area hot work is to be carried out. This area must be swept clean of combustibles, dust, lint, swarf, chippings, etc. including around beams or other spaces in which accumulations may occur and where heat may reach.

Consideration must to be given to the potential transfer of heat by conduction, for example along pipework passing into potentially combustible construction or storage areas.

Combustible floors need to be wetted or covered in damp sand or other fire proof material.

All flammable liquids and compressed gasses must be removed from the work area but if it is not possible to remove normally combustible materials, they need to be covered with a fireproof blanket sufficient to prevent the ingress of hot materials.

To prevent the spread of fire, all holes in walls, gaps in the floor, voids, vents and conveyors must be protected with non-combustible materials.

### Hot Work Permit

A hot work permit acts as a formal checklist and provides documentation of the controls that have been implemented.

A sample permit is available in AIG online library, under the ignition section. The web address is: <https://www.aig.com/business/insurance/property/risk-engineering-solutions>

The form and checklist must be fully completed and signed by the appointed person as well as the person completing the work before the work is allowed to commence.

Once all parties are satisfied and the form has been signed, a copy should be held on file with the original taken to the work area and prominently displayed.

### Hot Work Operation

Once work has commenced, should there be a need to use a fire extinguisher, work must be stopped until the full cause of the fire has been understood, appropriate action has been taken to prevent a reoccurrence and used extinguishers have been replaced.

If the maximum permit period of a single shift needs to be exceeded, the appointed person must be informed and a new permit issued by them with all sections completed and signed off by all parties.

If there is any doubt about the work being carried out, the hot work must stop, the appointed person notified and the fire watch retained.

Completion of Works

Once the hot work has been completed the area must be cleared of work equipment and waste materials with all isolated fire detection and suppression systems reinstated.

The fire watch needs to be retained for 60 minutes. If no signs of fire after this time, the fire watch section of the permit must be signed off by the fire watch.

The area needs to be monitored for an additional 120 minutes. If no signs of fire after this time, the final check up must be signed off by the fire watch.

The permit will now be closed and should be returned to the appointed person and held on file for reference.

Regular audits of the retained permits needs to be carried out to ensure permits are fully completed and have been signed off as required.

References

FPA RC7 – Recommendations for Hot Work, The Fire Protection Association

NFPA 51 B – Standard for Fire Prevention During Welding, Cutting and Other Hot Work, 1999 Edition

For further information please contact your local AIG risk engineer.

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