Hot Work

Hot work is defined as any process that uses or generates open flames, sparks or heat, such as welding, cutting or brazing.

Hot work represents a very high fire risk and has the potential to cause major losses on your facilities, as well as on the sites where hot work is carried out by contractors. Hot work is one of the three most common causes of fires and material losses on insured properties. The fire and explosions caused by uncontrolled hot work have costly impacts on companies. Hot work losses occur due to negligence, lack of or improper training, and absence or non-adherence of strict hot work safety guidelines and protocols. All of these are linked to human error, and are therefore preventable. It is essential for your organization to recognize these mistakes and to implement the necessary controls and loss prevention practices in order to minimize the risk of loss.

◉ On-site vs. Off-site Fabrication/Maintenance Welding

Whether hot work is performed during normal operations or during equipment maintenance/repair, on-site operations are generally considered safer. On-site environments are familiar to employees, designed for the type of work that is done, and contain fire safety equipment. Regardless, it is crucial to have a hot work management program in place to manage risks.

Off-site operations have a higher rate of challenges and risks because each work site varies in layout and the type of work that is performed. A comprehensive hot work safety management program properly trains and prepares contractors for various hot work environments, such as construction site work, plant maintenance, machinery repair welding, etc.

◉ Risks Associated with Hot Work

Potential fire scenarios can include welding and cutting of metal performed in open areas or near pits, in proximity to combustible parts, materials, or construction elements.

Hot work is a dangerous fire risk and must be controlled. As it is linked exclusively to the human element, very strict guidelines, procedures, and controls must be in place to ensure that these operations are performed safely. Proper site assessment and preparation, employee training, adequate controls, and safety equipment will all contribute to managing the risk of hot work.

While the intent of this Risk Insight is to provide you with the important highlights of managing the risk of hot work within your organization, it is not meant as a treatise on the subject. We invite you to consult the CSA standard W117.2-12 "Safety in welding, cutting, and allied processes" in order to set up your own hot work safety management program.

Proper **site assessment** and **preparation, employee training,** **adequate controls,** and **safety equipment** will all contribute in managing the risk of hot work.
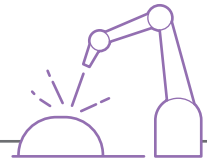
Experience has shown that sparks and hot slag generated by hot work processes can fly, roll, bounce, and shower onto floors, ceilings, walls, and other elevated surfaces, or get lodged into hidden cracks and crevices. Sparks and hot slag can travel great distances and have the potential to ignite any combustible material in their radius (horizontally and vertically). The minimum radius distance to be cautious within is 15 m (50 ft). Operations such as grinding, thermal spraying, roofing membrane application (hot process), and even frozen pipe thawing are other examples of risks associated with hot work.

This Risk Insight will guide you on how to better control this risk and how to establish a good hot work safety management program. In Canada, the fire codes of most provinces and territories substantially adopt the National Fire Code of Canada (2010). Section 5.2 of the NFC of C dealing with the safety regulation of hot works activities calls for compliance with CSA Standard W117.2 "Safety in welding, cutting, and allied processes."

◎ What is a Hot Work Management Program?

A hot work management program establishes controls and safety protocols aimed at identifying hot work hazards and controlling their associated risks. A program should include the development of policies, procedures, and the assignment of responsibilities and accountabilities for all aspects of hot work.

A program includes:

Policies

- Where hot work is permitted?
- When hot work is permitted?
- Who hot work is authorized by?

Procedures

- What to assess before permitting or performing hot work in an area or on a piece of equipment.
- What to prepare in a hot work area.
- What to do if hot work cannot be avoided in a particularly hazardous area.
- Which hot work tools are approved for use.

- How to obtain a hot work permit, when they are required, and who can administer them.

Training

- Which employees, supervisors, maintenance individuals, fire wardens, trained fire watch individuals, and contractors must be trained on hot work?

Communications

- Post all policies and procedures.
- Post signs in areas where hot work is prohibited.

Fire Extinguishing Equipment

- An adequate supply of suitable fire extinguishing equipment must be maintained in a state of readiness within immediate reach of workers, for instant use at the work site. The equipment must be appropriate to the potential fire or explosion hazard and may consist of approved portable fire extinguishers, fire hose, pails of water, buckets of sand, or other means depending on the nature and quantity of the combustible material exposed. Workers must be trained on the proper use of the fire extinguishing equipment.
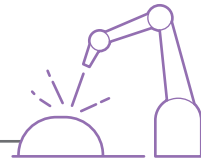
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◉ Key Points for your Hot Work Management Program

On-site

- Obtain a hot work permit before working.

- Place combustibles 15 m (50 ft) away from the hot work area, or shield with flameproof covers or curtains extending to the ground.

- Cover floor and wall openings within 15 m (50 ft) with non-combustible materials to prevent the passage of sparks or hot slag.

- Sweep surrounding areas and keep combustible floors wet.

- Stop any process or activity that produces flammable gases or vapours, and combustible dusts or fibers, and remove these hazardous conditions before carrying out hot work.

- Ensure fire extinguishing equipment, including multi-purpose fire extinguishers and fire hoses, are accessible.

- Designated personnel must watch for fire in the area, as well as floors above or below, as necessary. A fire watch should continue for a minimum of sixty minutes after completing hot work, as specified in the NFC, but can last up to several hours as deemed appropriate for the risk to be eliminated. Take into consideration the particular circumstances of such work at the building, area or site.

- Final inspection of the hot work area should be conducted four hours after the completion of work.

- If a continuous fire watch cannot be performed, hot work should not be done.

- Hot work should not be done in the last 60 minutes of the work day or 60 minutes prior to any breaks.

Off-site

- If you are performing the hot work at a client's site, always check if they have their own hot work management program and adhere to it strictly, including any permit system in place.

- Obtain your clients' approval and sign-off, and then document all your procedures and actions.

- Survey the hot work area and remove combustible material.

- If combustible material cannot be removed, use thermal barriers to protect it.

- Conduct a fire watch for at least 60 minutes after finishing hot work.

- Check with your insurance broker for any limitations in your liability coverage pertaining to hot work.

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