



Intact Inland Marine

Risk Management: Hot Work Operations

Any operation that generates heat, sparks or flame is considered, “hot work.” Such activity, including welding and cutting, presents a severe risk of fire as it introduces potentially uncontrolled ignition sources. Combustible materials produced from hot work, such as sparks or molten dummies, can smolder and eventually burst into flame or can ignite other flammable materials located too close to hot work operations.

Poorly managed hot work practices can threaten the investment you’ve made in your business. Consider these risk management solutions to protect what you’ve worked so hard to build.

A Permit System is Good Protection

One of the most successful methods to control hot work related fires is to implement a permit system to help ensure proper procedures are followed before, during and after hot work activities are conducted. Intact Inland Marine Hot Work Permit system should be used whenever maintenance personnel or contractors perform hot work operations. This system, combined with strong management support and trained employees, can help reduce the risk of fire in large and small facilities alike.

Loss Can Happen to Anyone

The biggest mistake an organization can make is to brush off the need of a permit system or become complacent with its use.

Often, owners of small facilities feel they don’t need a formalized permit system because hot work is conducted infrequently. Actually, the less frequently hot work is performed, the more important it is to have an established program, because employees may be unfamiliar with the hazards and appropriate precautions to take.

On the other hand, if you operate a larger facility that has an established system, be careful not to become complacent. When a large number of permits are issued regularly, the permit process can become a formality. Permits may be issued without careful assessment to verify that contractors and experienced employees are taking necessary precautions.

Companies can also suffer disastrous fires due to a complacency related to outside contractors. Many simply trust that these contractors “must know what they’re doing.” Actually, contractors cause approximately one-third of the hot work-related fire losses reported to us. A contractor, unlike your employees, has fewer vested interests in your facility’s continued productivity. In fact, because of time and money constraints, the contractor may have more of an incentive to do things as quickly as possible, regardless of the safety concerns involved.

Therefore, always supervise all contractors closely, applying all of the same rules and regulations that your employees must follow. It is also wise to have a written contract that specifies your standards of conduct and fix-liability in the event of a loss.

In addition to written contracts ...

- Select only contractors who have properly trained personnel and are aware of the magnitude of the risks involved.
- Advise contractors about any flammable materials or hazardous conditions where they must take special precautions.

When to Use a Permit

Ideally, all hot work operations should be conducted in designated, properly safeguarded areas such as maintenance shops or a detached outside location. When work can't be moved into the maintenance shop, make certain the employee or contractor obtains a hot work permit before doing the work. Issue the permit only after a trained supervisor has assessed the area and verified that the employee or contractor is taking appropriate safety precautions.

Supervisor Guidelines

The best way to prevent hot work fires is to strictly monitor the situation. Appoint responsible people to closely supervise the use of all hot work equipment; make sure they're thoroughly familiar with related processes and hazards so work can be completed in a safe manner. The success of your permit program will depend on the training and knowledge of those who implement it. We also recommend the following guidelines for supervisors:

- Before permitting cutting or welding, inspect the work area to verify that all fire precautions have been taken. Start the inspection with this simple question: "Is a hot work operation necessary to complete the work?"
- Contractors often use welding and flame cutting because they're fast and easy, even though they could use other, safer methods such as mechanical fastening and sawing. If hot work isn't absolutely necessary, don't permit it—especially in hazardous areas.
- Upon verifying that precautions listed on the permit were implemented, sign the permit and give it to the employee or contractor performing the work. Note the date and time the permit expires, the area involved, the type of job and the names of assigned fire watch personnel.
- Supervisors should allow no work to begin without a properly signed permit at the work site; and they should keep a copy of the permit as a reminder of the project. If the work will continue for more than one shift, issue a new permit for the next shift. If the supervisor and contractor or employees are unable to make the conditions safe, insist on other methods to complete the maintenance request.

Safe Hot Work Procedures

1. PRECAUTIONS

- To extinguish any fires that may start, provide a fire watch for the involved area. Include tours of the floors above and below. The fire watch should be continuous during the

hot work operation, during meal breaks, and for at least 30 minutes after the work has been completed. If the hot work ends near the time of a shift change, have the patrols continue into the next shift.

- The fire watch should be equipped with an adequate complement of portable extinguishers and/or charged small hose lines; personnel must be trained in their use. They should also know how to sound a fire alarm.
- Use only equipment that is in good condition. Valves, regulators, hoses, and torches should be thoroughly checked. Before beginning hot work operations, secure the gas cutting and welding cylinders so they will not be upset or damaged. Verify that the protective caps are on all cylinders when not in use. When using electrical arc-welding equipment, the ground clamp can be a source of ignition. The ground clamp should be carefully connected close to the work so that it can be easily observed.
- For buildings equipped with tested and active sprinkler systems, the systems should remain in service while any welding, cutting, or other hot work is done.

2. WITHIN 35 FEET OF THE WORK AREA

- Prohibit hot work until surrounding floors have been swept clean.
- If floors are made of combustible materials, wet them or cover them with damp sand or other noncombustible material.
- Remove all flammable liquids from the area and clean up any oily deposits.
- Move combustible items at least 35 feet from hot work operations. If you're unable to move these items, protect them by metal guards or flame-resistant curtains or covers. DO NOT use ordinary tarpaulins.
- Prohibit hot work until all openings in walls and floors within 35 feet of the operations have been tightly sealed or otherwise protected with metal guards or flame-resistant tarpaulins.

3. WORK ON WALLS AND CEILINGS

- Don't work on combustible walls or ceilings, or those containing combustible insulation.
- Move combustible items away from the other side of the wall so any heat that is transmitted through the wall cannot ignite them.
- When working on ceilings or upper levels of process equipment, suspend fire-resistant tarpaulins beneath the work area to collect sparks.

4. WORK ON ENCLOSED EQUIPMENT

- Before working on enclosed equipment, remove any combustible residue from its interior. With duct systems, in addition to removing combustible residue from its interior, remove any combustible screens or dust bags.

- Prohibit hot work in or on vessels containing flammable or combustible contents or residue, until they have been completely cleaned and purged or inerted. If there is any chance of a gas vapor release during the hot work operations, use gas detectors to constantly monitor the area.

5. FINAL CHECK-UP

- After the hot work is completed, the contractor or employee should complete the permit and return it to the supervisor.
- Supervisors should check the area within two to four hours after the work has been completed. After this final check, the supervisor signs the permit. Both sections of the permit should then be stapled together and kept on file.

Losses DO Happen—Examples

1. Cutting torch operations in an operational saw mill caused sawdust and wood chips to ignite in the mill. Due to the presence of sawdust, pitch, and a large quantity of wood throughout the structure, the fire spread rapidly. The saw mill had no smoke alarms. Although there was a sprinkler system, it was not operational because a backflow device had been shut off. This lack of water prevented the system from controlling the fire. Instead air tankers and helicopters made repeated water drops, finally putting out the fire, but leaving behind significant damage.

Total loss from the fire? \$12.5 million.

2. A welder was adding new duct work to existing grease ducts in the kitchen of a casino pavilion attached to a two-story casino. The pavilion contained shops, restaurants, and a ballroom, but was undergoing major renovations. The worker spotted smoke and fire, but could not find an extinguisher to use on the flames. Grease and wood structural members ignited, and the fire spread to the ballroom, then into the hallway and throughout the building. The fire alarms in the building were operational and notified the workers, who evacuated safely. The pavilion was a total loss, but the casino was untouched by the fire due to the work of firefighters who came to the scene.

The total bill for the incident? \$340 million.

About Intact Insurance Specialty Solutions

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Date: _____

Location: _____

Fire Watch

- Fire watch will be continually provided, including on floors above and below, during and at least 30 minutes after the work and during any coffee or meal breaks
- Fire watch staff is supplied with adequate fire extinguishers or charged fire hoses
- Fire watch staff is trained in the use of this equipment and in sounding the fire alarm
- Assigned fire watch person(s): _____

Within 35 ft. of work

- Floors swept clean of combustibles
- Combustible floors have been wet, covered with damp sand, metal or other shields
- All flammable liquids have been removed
- All combustible materials have been removed or covered with fire-resistant tarpaulins or noncombustible shields
- All wall and floor openings are covered

Precautions

- Sprinklers in service, if available
- Hot work equipment in good repair

Work on walls & ceilings

- Construction is noncombustible and does not have combustible coverings or insulation
- Combustibles are moved away from the other side of walls
- No danger of heat conduction into another area

Work on enclosed equipment

- Enclosed equipment cleansed of all combustibles
- Containers have been purged of flammable vapors/liquids

Permit Approval: The above location has been examined. The above precautions listed above have been checked and have been taken to prevent fire.

Signed: _____

This permit issued:

Date: _____ Time: _____

Final Check: The area has been checked 2-4 hours after work was completed.

Signed: _____