YOU CAN PREVENT CUTTING AND WELDING FIRES

AN OUNCE OF PRECAUTION...

Careless use of welding and cutting tools can cause fires which may destroy business, delay production and injure or kill. However, these tragedies need not occur if reasonable precautions are taken.

Permanent welding and cutting operations conducted in safely designed production areas are generally not the source of welding and cutting caused fires. It is portable equipment, used on construction or repair work done near combustible materials, that cause the greatest number of welding and cutting fires. Therefore, extreme caution should be exercised when working with portable equipment.

Unfortunately, many precautions which should be exercised simply are not, because (1) everyone is in a hurry to get the job done quickly and economically, and (2) management may not recognize and emphasize the seriousness of a fire. Therefore, it is imperative that the cutter/welder, his supervisor and management *all* share the full responsibility for the safe use of cutting/welding equipment.

Management should:

- Establish approved areas for cutting and welding or establish procedures for approving cutting and welding operations.
- Designate an individual to be responsible for authorizing cutting and welding operations in areas not specifically designed or approved for such processes.
- Insist that only approved equipment be used.
- Insist that all cutters, welders, and their supervisors are properly trained in the operation of the equipment and emergency procedures in the event of a fire.
- Select outside contractors, when needed, on the basis of properly trained personnel who are aware of the risks involved in cutting or welding.
- Advise all contractors about *any* flammable materials or hazardous conditions.

The Supervisor (Foreman, Plant Engineer, Plant Manager, etc.) should:

- Be responsible for the safe handling of equipment and safe use of the process.
- Determine what combustible materials and hazards are likely to be present.
- Protect the combustibles from ignition by removal or shielding.
- Make certain any operations that might expose combustibles to ignition are not started during cutting or welding.
- Be sure proper fire extinguishing equipment is located at the work site.
- See that fire watchers are trained and present at the site.
- Secure a welding/cutting permit from the management designated individual responsible for such authorization.

The Cutter/Welder should:

- Cut or weld only after being certain all equipment and surrounding conditions are safe.
- Receive written approval to cut or weld from the responsible supervisor.
- Continue to work only as long as approved work conditions remain unchanged!

KNOW HOW FIRES START

If you know the ways fires can start, then you are one step ahead in learning how they can be prevented.

Fires can start from the oxyacetylene flame itself, from metals being welded or cut, from molten slag and metal that flows or drips from the cut, and from sparks which fly from the work.

Sparks from cutting/welding.

Sparks from cutting/welding must be closely watched to make sure they do not set fires. These sparks are small globules of molten metal which are thrown out in a heavy shower. Sparks and molten metal from oxyacetylene cutting are more hazardous than those from welding because they travel farther. Therefore, the likelihood of a fire is greater. They can be thrown for distances of 30 or 35 feet...particularly, in cutting operations. These sparks hold heat and can ignite any light combustible material on contact. They often cause smoldering fires which go undetected until flames are noticed hours later.

Heat from metal being welded or cut.

Small, hot pieces of metal, particularly those cut from iron and steel, can cause fires if they come in contact with materials that burn easily. The smaller the piece cut away, the more heat will have been absorbed. Hence, the more likelihood that it will set fire to combustible materials. Pieces of iron or steel which have been heated to a bright red color may retain enough heat to start a fire for 5 to 15 seconds or longer under some conditions. Even if the piece may appear black in daylight, it could still start a fire.

BE PREPARED TO PUT OUT FIRES

When cutting or welding torches are used in locations containing combustibles, every precaution should be taken to prevent a fire. However, if a fire occurs, you should sound the alarm, and, if there is no threat of injury, extinguish it immediately.

Make sure fire extinguisher or hose is available.

You can prevent the spread of small fires with a fire extinguisher or hose. Have a helper on hand for this purpose because the operator who is wearing dark goggles may not be able to see a small fire when it starts. Make sure the person has been properly trained in using extinguishing equipment.

Make sure sprinklers are operative.

If the area in which cutting or welding is performed is equipped with automatic sprinklers, maintain the sprinkler protection while work is in progress. It is important that sprinklers are in service during extensive repairs or building changes. If they must be shut off, stop welding or cutting immediately.

ALWAYS PRACTICE SAFETY FIRST

Fires from welding and cutting are preventable. It is up to you to practice the proper safety precautions. If you familiarize yourself with the preventive steps and measures outlined in this bulletin, you may save countless dollars and prevent needless injuries and deaths.

TAKE THE PROPER SAFETY PRECAUTIONS

Fires from welding and cutting can be prevented if the following precautions are taken:

1. Never begin work in a new area without checking with the person in authority for potential fire hazards. That person may know of a serious fire hazard that you may fail to guard against.
2. There should be supervision by a qualified individual, such as a welding superintendent, foreman or plant engineer.

   This person should examine the location of any proposed work, insist on methods of protection if conditions are unsafe, and specify precautions to be taken.

3. Never cut or weld in an area not authorized by the management. A designated individual will be responsible for such authorization.
4. Never cut or weld around explosive atmospheres or explosive atmospheres that may develop inside uncleaned or improperly prepared drums, tanks or other containers *or* equipment which may have contained explosive material, i.e., flammable liquids, gases, vapors or combustible dust.
5. Do not use cutting or welding equipment near rooms or areas containing flammable or combustible material if there is a chance sparks will pass through cracks, or holes in walls, floors, broken windows or open doorways.
6. Keep in mind that certain types of dust are explosive under some conditions.
7. Whenever possible, take cutting or welding work to a safe location. If the work cannot be moved, materials that are combustible should be moved a distance of 35 feet or more from the point of cutting or welding.
8. Never cut or weld near large quantities of exposed, readily ignitable materials, such as bulk sulfur, baled paper or cotton.
9. Sweep floors clean before starting work.
10. Prevent flames, sparks, molten slag and hot metal from coming in contact with combustible materials.
11. Keep sparks away from areas where flammable vapors are present.
12. Cover combustible material which cannot be moved with sheet metal guards, fire resistive curtains or other protection.

    Be sure the guards are large enough and sufficiently tight or weighted down to prevent sparks from rolling underneath or sliding through openings.
13. Before cutting off a piece of steel or iron, make sure it will not drop where there is a possibility of starting a fire, especially when working in high places.
14. A fire watch is required when hot work is performed in a location where other than a minor fire might develop or where the following conditions exist:
    - Combustible materials in building construction or contents are closer than 11 m (35 feet to the point of operation.
    - Combustible materials are more than 11 m (35 feet) away from the point of operation but are easily ignited by sparks.
    - Wall or floor openings within an 11 m (35 feet) radius expose combustible materials in adjacent areas, including concealed spaces in walls or floors.
    - Combustible materials are adjacent to the opposite side of partitions, walls, ceilings, or roofs and are likely to be ignited.
15. The fire watch should be maintained for at least 30 minutes after operations have been completed. Check the area thoroughly at least sixty minutes after the job is completed to make sure a spark is not smoldering in some out-of-the-way place, such as pipe chases, elevator shafts and conveyor openings.

References

American Gas Association, "Purging Principles and Practices."

American Welding Society, "Safety in Welding and Cutting."

American Welding Society, "Safe Practices for Welding and Cutting Containers That Have Held Combustibles."

National Fire Protection Association, 51B, "Cutting and Welding Processes."

National Fire Protection Association, 326, "Standard for the Safeguarding of tanks and Containers for Entry, Cleaning or Repair."

United States Coast Guard, "A Manual for the Safe Handling of Inflammable and Combustible Liquids."

HOT WORK PERMIT

Hot work includes cutting, welding, brazing, grinding, soldering, thawing pipes, torch applied roof covers, and any operation involving open flames, generating sparks or heat.

Supervisor must inspect the proposed work site before authorizing this permit, and check the precautions below that are taken.

- ☐ Sprinklers are in working order
- ☐ Cutting/Welding equipment is in good condition

Within 35 feet. of the work site

- ☐ All flammable liquids are removed
- ☐ Combustibles are removed or covered with fire resistant tarps or noncombustible shields
- ☐ Combustible floors are wetted down and covered with damp sand or noncombustible material
- ☐ Floors are swept clean of combustibles
- ☐ All floor and wall openings are covered adequately

Work on walls/ceiling

- ☐ Fire-resistant tarps are suspended beneath work area to collect any sparks
- ☐ Combustibles have been moved away from the other side of the wall
- ☐ Construction is noncombustible and without combustible coverings or insulation

Work on enclosed equipment

- ☐ All containers have been purged of flammable vapors
- ☐ Combustibles have been cleaned off enclosed equipment

Supervisor must complete this section. Sheet to be kept at the work site.

FINAL CHECK-UP

- ☐ The cutting/welding permit has been completed and returned
- ☐ The site was examined 2-4 hours after the work completed

Signature (Supervisor)

This section is to be completed and signed by the supervisor after completion of the project. Permit sections should then be fastened together and kept on file for review by a CNA representative.

For more information please call us toll-free at (866) 262-0540 or visit us online at www.cna.com/riskcontrol

HOT WORK PERMIT

Date | Area | Building/Floor

Work to be done:

Fire watch person(s):

FIREWATCH PRECAUTIONS

- ☐ While the work is in progress, during any lunch and/or coffee breaks, and for a minimum of 30 minutes after the work is complete, a continuous firewatch is to be provided for floor where work is taking place and floors above and below the work site.
- ☐ Fire extinguishers and/or a charged small hose is available during firewatch.
- ☐ Firewatch person is trained in sounding the fire alarm and in the use of firewatch equipment.

The location noted above has *been examined. The precautions listed above and the applicable precautions* on *the reverse side* of *this form have been checked* to *prevent fire.*

Date Permit Expires: _____ Time: _____ AM ☐ PM ☐

Signature (Supervisor)

Supervisor completes this section. Keep this at work site.

HOT WORK PERMIT

Permit Issue Date: _____

Location: _____

Supervisor should keep this section. Reminder of *project.*