

# BULLETIN

*Risk Control*

ACWA/Joint Powers Insurance Authority, 5620 Birdcage Street, Suite 200, Citrus Heights, CA 95610-7632, (800) 231-5742

by R. Scott Wood

November 2009

## *Welding and Cutting Operations — Hot Work Permits*

Prior to performing welding/cutting operations, preventative measures need to be implemented to protect personnel and property against heat, evolved gases and fumes, electrical shock, and radiation. Many of these measures are addressed within designated welding/cutting areas designed to mitigate exposure to such operations. A hot work permit should be prepared to ensure these measures are implemented. In the following circumstances, a hot work permit must be completed and approved by the appropriate supervisor:

- ◆ In locations that have not been designated as welding locations;
- ◆ During confined space entries;
- ◆ Welding or cutting tanks, cylinders, or other containers;
- ◆ In areas where a fire hazard may exist (example: weeds, wood products, fabrics, etc);
- ◆ In areas included in the Process Safety Management Program (if applicable);
- ◆ In areas where combustibles are within 35-feet of the point of operation; and
- ◆ In areas where combustible materials are adjacent to the opposite side of metal walls, partitions, ceilings, or roofs; and areas likely to be ignited by conduction or radiation.

Copies of open permits must be maintained at the job site and in the supervisor's office. Upon job completion, closed permits should be maintained for three years.

**Welding/Cutting Areas:** Whenever possible, welding and/or cutting operations should be performed

in areas that are isolated and designated for such uses. Welding or cutting must not be performed in the following areas:

- ◆ In the presence of explosive atmospheres;
- ◆ In areas near the storage of quantities of exposed, ignitable materials;
- ◆ In sprinklered buildings while such protection is impaired; or,
- ◆ In areas not authorized by management or by a hot work permit.



**Fire Watch:** Should other precautions fail, trained personnel

will be needed with firefighting equipment to extinguish any fires which start. Personnel and equipment must be readily available before the permit is issued, and:

- ◆ Be trained in the use of fire extinguishing equipment.
- ◆ Be familiar with alarm locations in the event of a fire.
- ◆ Watch for fires in all exposed areas, and extinguish them within the capacity of equipment available.
- ◆ Maintain a fire watch for at least a half hour after completion of welding or cutting operations.
- ◆ Report any injury, including suspected flash burns, to the supervisor.
- ◆ Fire watch will be provided during and for at least 30 minutes after work, and during any coffee or lunch breaks.
- ◆ Fire watch is supplied with suitable extinguishers.
- ◆ Fire watch is trained in use of this equipment and in sounding alarm(s).

**Site Preparation:** Prior to beginning welding or cutting operations, workers must:

- ◆ Check the work area (35-foot radius) to ensure that no fire hazards including oily or greasy materials are present.
- ◆ Remove all combustible materials within 35-feet not necessary for the operation. Any combustible material that cannot be removed, such as wood platforms, should be covered with a flame-resistant material.
- ◆ Check that all equipment is in good working condition.
- ◆ Inform workers in the immediate area and display warning signs at the worksite to alert others of the potential hazards.
- ◆ Install welding shields/curtains to protect other workers from the sparks and intense light associated with welding/cutting operations.
- ◆ When performing welding, cutting, and/or brazing operations in areas on or around Acutely Hazardous Materials, which are included in a Process Safety Management (PSM) Program, a hot work permit is required.



Examples of PPE include eye protection, helmets and hand shields, flame resistant gloves, limb/body protection, and respiratory protection.

- ◆ While performing overhead or vertical welding, personnel must wear leather personal protective equipment (shoulder, head, and ear covers).
- ◆ All welders should wear flame-resistant aprons, coveralls, gauntlet gloves and shirts with sleeves of sufficient length and construction to protect the arms from heat, UV radiation, and sparks.
- ◆ Wool and leather clothing are preferred because they are more resistant to deterioration and flame than cotton or synthetics. Synthetic fiber clothing should not be worn unless it is specifically manufactured to be fire retardant.
- ◆ Clothing should be kept reasonably free of oil or grease.
- ◆ Front pockets and upturned sleeves or cuffs should be prohibited. Sleeves and collars should be kept buttoned and high boots should be worn under pant legs (or leggings worn) to prevent hot metal slag or sparks from contacting the shin.
- ◆ Personnel must wear respiratory protection when ventilation is not sufficient to prevent exposure above permissible limits. (When performing cutting or welding operations involving coatings which generate toxic substances upon heating, or working with materials that contain beryllium, cadmium, lead, or mercury, personnel must wear supplied-air respirators).
- ◆ Workers welding on metal alloys should wear work uniforms, coveralls, or similar full-body coverings that are laundered each day. Lockers or other closed areas should be provided to store work and street clothing separately.
- ◆ Other personnel in welding/cutting areas not protected by noncombustible or flameproof screens or shields must wear appropriate goggles.

**Ventilation:** Cutting or welding operations must be performed in areas with adequate ventilation, to keep fumes and gases within safe limits.

- ◆ Local exhaust ventilation must be used when potentially hazardous materials are being worked on. (Examples of potentially hazardous materials include, but are not limited to, chromium, fluorides, zinc, beryllium, cadmium, lead, and mercury).
- ◆ Adequate exhaust ventilation must be used when using inert-gas welding, plasma-arc cutting or carbon-arc cutting.
- ◆ The metal surface shall be free of all chlorinated solvents during any welding or cutting operations.

**Personal Protective Equipment:** Approved personal protective equipment (PPE), shall be worn by all employees performing or assisting in welding and/or cutting operations.

**Risk Management Staff**

Walter "Andy" Sells, Chief Financial & Operations Officer  
Keith Forbes, Senior Risk Management Consultant  
John Haaf, Senior Risk Management Consultant  
Peter Kuchinsky II, Senior Risk Management Consultant  
Lee Patton, Senior Risk Management Consultant  
R. Scott Wood, Risk Management Consultant  
Terry Lofing, Administrative Assistant II

