

Applies to: employees, staff, and students.

This standard operating procedure (SOP) documents procedures to protect employees and prevent combustible materials from exposure to fire, sparks, hot metal, or any other source of ignition whenever hot work is performed outside of a designated safe hot work area. Definitions, responsibilities, hot work requirements, and hot work in confined spaces are discussed below. This SOP also addresses Occupational Safety and Health Administration (OSHA) requirements specified in Title 29 of the *Code of Federal Regulations* (CFR) 1910.252 for fire prevention and protection during welding, cutting, and brazing, and follows NFPA 51B – Fire Prevention During Welding, Cutting and Other Hot Work.

## 1.0 DEFINITIONS

**Designated Safe Hot Work Area:** An area that has been designed and constructed specifically for performing open-flame or spark-producing work and is maintained free of combustible materials (i.e., maintenance shops can be designated safe hot work areas) and has been certified by an Issuer of Permit.

- ◆ The Designated Safe Hot Work Area(s) *define areas in your department that you deem safe areas not requiring a hot work permit. Identify areas with sign – see appendix A)*
- ◆ Outside the building at least 40' from structure or special hazard, not including the roof.

These areas should be inspected prior to each hot work operation to ensure they are free of combustible materials.

**Fire watch:** At least one individual dedicated solely to the look out and control of stray fires. See responsibilities in the next section.

**Hot Work:** Work using an open-flame or spark-producing apparatus including, but not limited to welding, cutting, burning, grinding, and related heat-producing operations that could ignite combustible materials or flammable atmospheres. Hot work excludes food preparation operations and use of Bunsen burners in labs (covered in NFPA 45- Standard on Fire Protection for Laboratories Using Chemicals).

**Prohibited Areas:** Cutting or welding shall not be permitted in the following situations:

- ◆ In areas not authorized by management.
- ◆ In sprinklered buildings where such protection is impaired.
- ◆ In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or explosive atmospheres that may develop inside un-cleaned or improperly prepared tanks or equipment which have previously contained such materials, or that may develop in areas with an accumulation of combustible dusts.
- ◆ In areas near the storage of large quantities of exposed, readily ignitable materials such as bulk sulfur, baled paper, or cotton.

## **2.0 RESPONSIBILITIES**

### **University Safety & Assurances (US&A)**

US&A is responsible for the umbrella Program consisting of the UWM Hot Work SOP Template, providing initial Hot Work training and annual fire extinguisher training, professional expertise, and annual program review. US&A may also be called upon, on an emergency basis, to verify permit conditions if a Department Head/Manager and/or Supervisor is unavailable.

### **Department Heads/Managers**

The Department head is responsible for:

- Creating and maintaining a Hot Work SOP specific to their work environment (s)
- Assuring all new employees receive initial training
- Assuring all employees performing fire watch duties receive annual fire extinguisher training
- Identifying and designating qualified Permit Issuers for their departments

### **Issuer of Permit**

The issuer of the permit shall be a qualified, designated individual that is trained regarding the UWM Hot Work Permit program and fire procedures. The issuer shall issue the permit after conducting a site inspection and prior to hot work beginning. The issuer will close the permit after conducting a site inspection 60 minutes after completion of the hot work. Designated personnel shall have adequate skills to manage the program in their areas. The following personnel may be designated an issuer of a permit (areas listed in parentheses):

- ◆ Department personnel (laboratories, shops, studios, or other academic units)
- ◆ Facility Services (work being performed on UWM facilities or grounds by Facility Services personnel or contractors)
- ◆ UWM Housing Facilities Assistant Director, B&G Superintendent or B&G Supervisor (work being performed in the UWM Housing buildings)

### **Supervisor**

Supervisors and/or their designees are responsible for:

- ◆ Ensuring that employees performing hot work are trained on this SOP and hot work requirements, operation of the hot work equipment, and fire safety and emergency procedures.
- ◆ Ensuring that contractor personnel meet requirements detailed in this SOP if performing hot work.
- ◆ Ensuring that a hot work permit is obtained from an Issuer of Permit (see above).

Hot work shall not begin until the supervisor can ensure and document the following:

- ◆ People and combustible materials will not be exposed to fire, sparks, or any other source of ignition.
- ◆ Emergency response procedures are in place.
- ◆ The work area is safe.

### **Fire Watch**

The fire watch shall:

- ◆ Attend all hot work performed in circumstances where a fire might develop (see below)
- ◆ Ensure that the appropriate extinguishing equipment is readily available and be trained in its use

- The type of hot work procedures performed shall determine the equipment required. At a minimum, an ABC extinguisher shall be provided. US&A can be consulted for assistance with fire extinguisher selection.
- Personnel should know the capacity of the fire extinguishing equipment available and not try to extinguish a fire beyond the equipment's capacity.
- ◆ Be trained on emergency fire procedures in the event of a fire
  - In the event of a fire, the fire watch shall sound the fire alarm.
    - See fire procedures at: <https://uwm.edu/safety-and-assurances/emergency-preparedness/#a14>
  - US&A can be consulted for assistance with fire procedures and extinguisher training.
- ◆ Remain in a location that allows immediate communication with the individual(s) performing hot work (operator)
- ◆ Order that all hot work cease should a fire be discovered
- ◆ Remain in the work area a minimum of 60 minutes after the work is completed to ensure the risk of fire from hot work has passed
- ◆ Contact the issuer of the permit to close out the hot work permit
- ◆ Note – the hot work operator cannot conduct the fire watch.

**Circumstances where a fire might develop are when one or more of the following exist:**

- ◆ An appreciable amount of combustible material that can be easily ignited (including material such as the building structure or other materials) is within 35 feet of the hot work area
- ◆ Wall or floor openings within a 35-foot-radius of the hot work area that expose combustible materials in adjacent areas. Openings include concealed spaces in walls or floors.
- ◆ Combustible materials likely to be ignited by conduction or radiation near the other side of hot work areas near the metal partitions, walls, ceilings, or roofs

**Operator**

The hot work operator shall:

- ◆ Be qualified and trained to properly operate the hot work equipment
- ◆ Perform hot work ONLY after a hot work permit has been obtained or after inspecting a designated safe hot work area for combustible materials and removing them.
- ◆ Cease all hot work
  - If the above circumstances are present or arise during operation where a fire might develop.
  - Should a fire occur.
  - Upon notification from the fire watch to cease operation.
- ◆ Be trained on emergency fire procedures in the event of a fire
  - In the event of a fire, the operator shall sound the fire alarm.
    - See fire procedures at: <https://uwm.edu/safety-and-assurances/emergency-preparedness/#a14>
  - US&A can be consulted for assistance with fire procedures and extinguisher training.

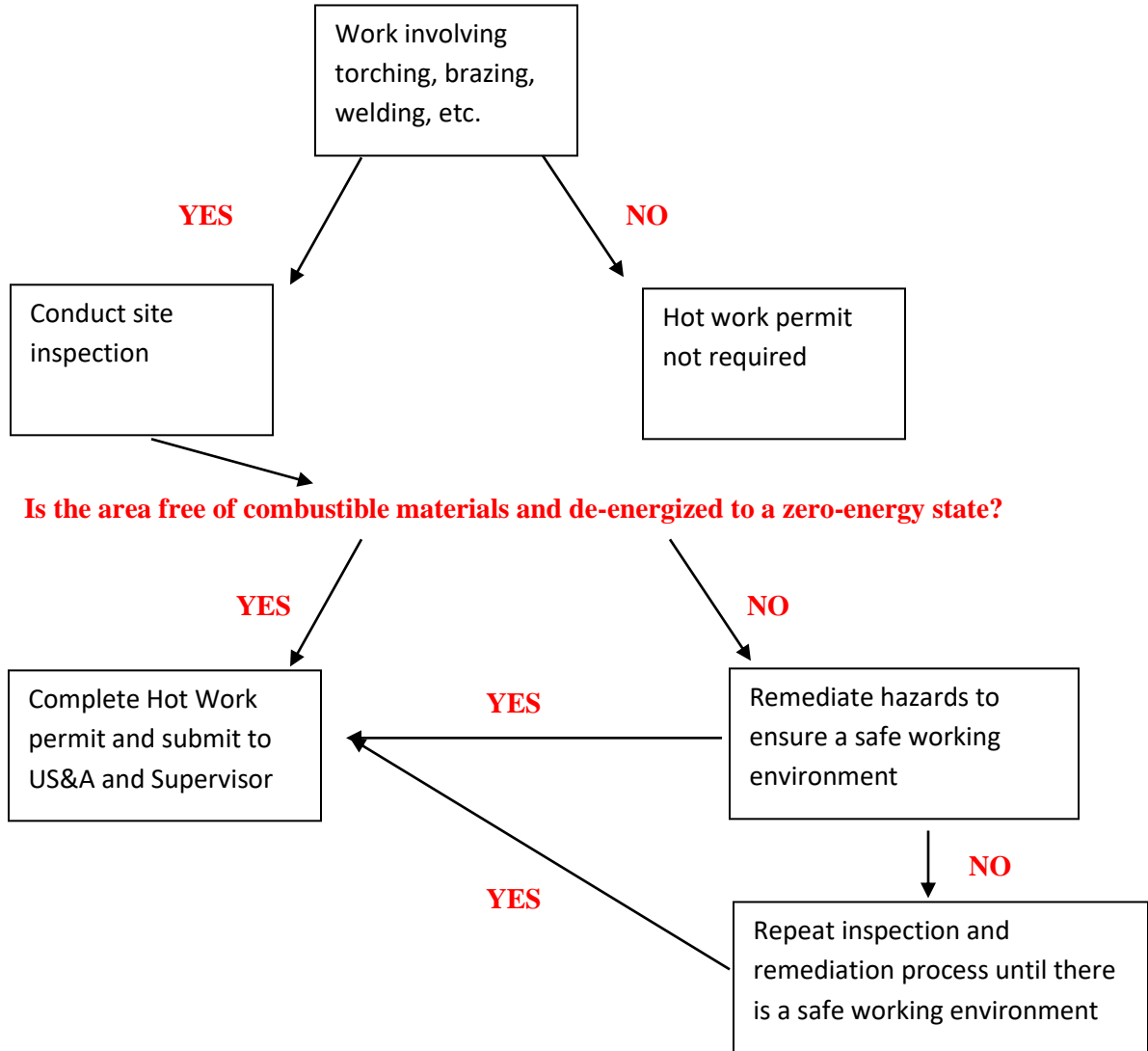
**Contractors**

Contractors may use their own hot work permit procedures if they meet or exceed the requirements of the UWM hot work program. Contractors are to maintain any fire watch duties during the project.

### 3.0 HOT WORK REQUIREMENTS

The following minimum requirements apply at locations where hot work will be performed:

- ◆ A hot work permit shall be completed to authorize hot work performed outside of designated safe hot work areas. Hot work may not begin until a permit has been obtained. The UWM Hot Work Permit is suitable for most hot work.



- ◆ Combustible materials, including ordinary combustible solids (wood, paper, cardboard, insulation, trash, etc.), and flammable and combustible liquids should be relocated at least 35 feet from the hot work area. If relocation is impractical, combustibles shall be protected with flameproof covers or shielded with metal or flameproof curtains.
- ◆ Measures should be taken to not inadvertently set off the fire alarm system.

- Methods to prevent accidental tripping of the system shall be verified with or conducted by Facility Services (414-229-4742).
- UWM Police (414-229-4627) and affected departments shall be notified of fire alarms being disabled.
- Contact Facility Services to place alarms back into service after hot work is completed. Notify UWM Police and departments of status.
- ◆ Lower areas should be roped off when hot work is performed overhead. Warning signs must then be posted to prevent combustible materials and personnel from entering the lower areas.
- ◆ Barriers should be placed around and under hot work areas to confine sparks unless this action is physically impossible.
- ◆ Open drains leading to underground systems that may contain flammable or combustible materials should be protected by the following:
  - The atmosphere should be tested for flammable vapors before a permit is issued and
  - The open drain should be covered with a fire blanket or similar protective shield to prevent the entry of sparks, even if a safe atmosphere currently exists.

#### **4.0 HOT WORK IN CONFINED SPACES**

When performing hot work in confined spaces, employees shall comply with a Confined Space Entry Program. In addition, employees shall do the following:

- ◆ Keep all gas cylinders and welding machines outside of confined spaces (this may not apply to heating/chilling tunnel activities if gas hoses cannot reach the work area).
- ◆ Positively isolate the gas supply outside the confined space when torches are not in use for a substantial period (such as during a lunch break); when practical, employees shall also remove torches and hoses from confined spaces.
- ◆ De-energize electrode holders by electrically disconnecting the power supply when arc welding is to be suspended for an appreciable amount of time, or the welder has occasion to leave work.
- ◆ Use insulating mats or similar insulating equipment to protect welders using alternating current equipment over 50 volts from electrical contact with conductive materials.
- ◆ Ensure that available ventilation in the confined space meets the ventilation requirements set forth in 29 CFR 1910.252(c) (Welding, Cutting, and Brazing- General Requirements).
- ◆ Monitoring shall be performed in the confined space area before and during hot work.
  - The permit issuer should specify on the hot work permit the concentrations of vapors and gases in areas, as applicable.
  - Hot work should not be performed if the concentration of flammable gases or vapors exceeds 10 percent of the LEL.
  - If flammable vapors or gases are present, but their levels do not exceed 10 percent of the lower explosive limit (LEL), hot work should not be started until the person approving the permit:
    - Knows the source of the flammable gases or vapors, and
    - Determines that their concentration will not increase while the hot work is in progress.

## **5.0 RECORDKEEPING**

### **Hot Work Permits**

All hot work permits shall be returned to University Safety & Assurances for their record retention. Records of hot work permits shall be maintained for one calendar year. Hot work permits on file should be reviewed for program improvement or modification purposes prior to disposal.

### **Training**

Training that shall be conducted in conjunction with this Hot Work Permit Program includes:

- ◆ The provisions of this Hot Work Permit Program
- ◆ Fire safety and extinguisher use
- ◆ Training for the type of hot work equipment in use
- ◆ Confined space entry, if applicable

Copies of records of all program-related training should be maintained in the department personnel files. Copies of training records should be sent to University Safety & Assurances.

**NOTICE**

**DESIGNATED HOT  
WORK AREA**

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**INSPECT THE AREA BEFORE EACH USE FOR  
COMBUSTIBLE OR FLAMMABLE MATERIALS  
AND REMOVE**

# Hot Work Decision Tree

