

**The University of Southern Indiana**

# **WELDING, CUTTING AND BRAZING SAFETY PROGRAM**

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## **1.0 INTRODUCTION**

### **1.1 PURPOSE**

The purpose of this policy is to prevent any fires that may result from "hot network" processes.

### **1.2 SCOPE**

1.2.1 For the purposes of this policy, "hot work" is defined as any temporary operation involving open flames or producing heat and/or sparks. This includes, but is not limited to, grinding; cutting, brazing, soldering; thawing frozen pipes by torch; torch applied roofing and welding.

1.2.2 This policy applies to all personnel (including contractors) who are involved with construction and maintenance activities and/or who may be involved in "hot work" activities at any location on campus.

## **2.0 RESPONSIBILITIES**

### **2.1 Environmental Health and Safety (EHS)**

The ultimate responsibility and authority for compliance with the USI hot work permit program rests with the Environmental Health and Safety. It is their responsibility to ensure that the hot work permit program is carried out within their area of authority.

### **2.2 Supervisors, Principal Investigators, Project Managers**

Individuals who have supervisory responsibility play a key role in the hot work permit program. It is their responsibility to ensure that:

2.2.1 Individuals working under their direction are trained and understand the applicable provisions of the hot work program and that all requirements of any hot work permit is fulfilled before work is performed.

2.2.2 An approved hot work permit is obtained from:

2.2.2.1 the Environmental Health and Safety for any hot work conducted on USI property, or

2.2.2.2 the life safety supervisor for any hot work conducted on USI property.

2.2.3 Properly trained fire watchers are assigned when required by the hot work permit.

2.2.4 Designated areas are established for welding, lifting, brazing, torch soldering and grinding operations where the potential fire danger is limited. (At the Facility Department's discretion, hot work conducted in these areas may occur under a general hot work permit, to be reissued monthly.)

2.2.5 Procedures are established for hot work in other areas.

2.2.6 Employees performing hot work (and their supervisors) are required to be suitably trained in the safe operation of the equipment.

- 2.2.7 All contractors are advised about flammable materials or hazardous conditions of which they may not be aware in areas where they will be working.
- 2.2.8 Outside contractors and service personnel are informed of the expectation that they will follow all OSHA requirements, including obtaining a hot work permit, if applicable to the job being performed.
- 2.2.10 Outside contractors have a verified hot work permit if one is required for the work being conducted.

### 2.3 Individuals Performing Hot Work

Individuals performing the hot work play what is perhaps that most important role in the program. They are responsible for:

- 2.3.1 Obtaining written approval from the Environmental Health and Safety or the life safety supervisor for the hot work to be conducted on USI property, or from their supervisors or principle investigators for hot work conducted on field projects or using hand hold torches in laboratory projects.
- 2.3.2 Ensuring that conditions are safe and hazard free before commencing the hot work.
- 2.3.3 Being prepared to contact their supervisors should conditions change or warrant reassessment during the hot work project.
- 2.3.4 Using appropriate personal protective equipment (PPE) while performing hot work (welding helmets, gloves, jackets, etc.).
- 2.3.5 Completing the appropriate section(s) of the hot work permit.
- 2.3.6 Returning the completed hot work permit to Environmental Health and Safety.

### 2.4 Fire watchers are responsible for:

- 2.4.1 Being aware of the inherent hazards involved in the hot work.
- 2.4.2 Ensuring that safe conditions are maintained during the hot work.
- 2.4.3 Ensuring that appropriate fire extinguishers are readily available.
- 2.4.4 Knowing how to report a fire or other emergency situation.
- 2.4.5 Maintaining the watch for at least 60 minutes after the work is completed.
- 2.4.6 Using the appropriate PPE.
- 2.4.7 Completion of the appropriate section of the hot work permit.

### 2.5 Facilities Supervisors are responsible for:

- 2.5.1 Maintaining cutting or welding equipment in a safe operating condition.
- 2.5.2 Ensuring the precautions listed on the hot work permit are understood by the person(s) performing the permitted cutting, welding or brazing operations.

### **3.0 PERSONAL PROTECTIVE EQUIPMENT**

- 3.1 Helmets or hand shields will be used during all arc welding or are cutting operations.
- 3.2 Helpers or firewatchers will be equipped with proper eye protection.
- 3.3 Goggles or other suitable eye protection will be used during all gas welding or gas cutting operations.
- 3.4 All operators and helpers of resistance welding or brazing will use goggles or face shields.
- 3.5 Gloves, aprons and other protective gear will be worn to protect against recognized hazards.

### **4.0 HOT WORK PROCEDURES**

#### **4.1 Hot Work Permit Forms**

The USI hot work permit (see Appendix A) will be the permit system.

#### **4.2 Prior to Hot Work**

Several tasks will be performed prior to hot work. The includes, but are not limited to:

- 4.2.1 Contact Facilities Management or the property manager to isolate the HVAC system for interior work and to locate intake vents on the exterior of the building.
- 4.2.2 Obtain hot work permit and post at the location in a highly visible area.
- 4.2.3 Inspect the hot work area to identify any fire hazards.
- 4.2.4 Remove all flammable or combustible materials within a 35-foot radius of the hot work.
- 4.2.5 Properly shield combustibles that cannot be removed from the area with non-combustible blankets or other non-combustible materials.
- 4.2.6 Seal all cracks and openings through which hot sparks or slag may enter. As an alternate means, a fire resistant shield may be used to block the openings.
- 4.2.7 Sweep floor of all loose combustible debris.
- 4.2.8 Placing non-combustible or flame resistant screens so as to protect personnel in adjacent work areas from heat, flames, radiant energy and welding splatter.
- 4.2.9 Protect conveyer systems that may carry sparks of slag to other parts of the building.
- 4.2.10 Post the area so as to warn nearby personnel of the danger. The backside of the hot work permit displays a warning sign.
  - 4.2.11 Cover sprinkler heads directly above the hot work area with wet rags or other non-combustible materials so they will not be triggered during the work.
  - 4.2.12 Cover smoke detectors located in close proximity of the work area.

### **4.3 During Hot Work**

There are other precautions that must be taken during hot work:

- 4.3.1 Appropriate fire extinguishing equipment shall be maintained in close proximity to the hot work for its entire duration, plus 60 minutes after completion of work.
- 4.3.2 Combustible floors shall be kept wet during the hot work.
- 4.3.3 Store acetylene and other fuel cylinders in a secure and upright position.
- 4.3.4 Place hoses so that they will not be crushed or damaged.

### **4.4 After Hot Work**

There are some responsibilities that must be undertaken after hot work is completed

- 4.4.1 The firewatcher will remain at the site for at least 60 minutes following the completion of the hot work.
- 4.4.2 **Fire extinguishing equipment must remain accessible in the area until the firewatch is secured.**
- 4.4.3 Remove any covers from sprinkler heads immediately upon completion of the hot work.
- 4.4.4 Remove covers from any smoke detectors immediately upon completion of the hot work
- 4.4.5 Completion of the appropriate section(s) of the hot work permit and the return of the completed form to Environmental Health and Safety.

### **4.5 Prohibited Hot Work Areas**

- 4.5.1 Areas equipped with sprinkler systems that are out of order.
- 4.5.2 Areas, including those with confined spaces, where atmospheres of explosive gases, vapors, or dusts exist or could accumulate.
- 4.5.3 On metal walls, ceilings or roofs built of composite, combustible and sandwich-type panel construction or having combustible coverings.
- 4.5.4 On containers where flammable liquids, solids or vapors may be present.
- 4.5.5 On pipes that are in contact with combustible walls, ceilings, roofs or partitions where heat by conduction can cause ignition.
- 4.5.6 Suspect lead-based painted areas and components.

### **4.6 Storage of Cylinders**

- 4.6.1 Cylinders will be stored at least 20 feet from highly combustible materials and where the cylinders will not be exposed to excessive rise in temperature, physical damage or tampering by unauthorized persons.

- 4.6.2 Cylinders must be chained at all times or otherwise secured to prevent them from falling over.
- 4.6.3 Oxygen cylinders will be separated from fuel gas cylinders or combustible materials at a minimum distance of 20 feet or by a noncombustible barrier at least five feet high, having a fire resistance rating of at least ½ hour.

## **5.0 TRAINING**

### **5.1 Individuals Performing Hot Work and Fire Watchers**

All USI employees performing hot work or acting as the fire watcher must be trained in order to conduct hot work activities. The training should contain at a minimum the following:

- 5.1.1 what starts hot work fires and explosions;
- 5.1.2 how fires can be prevented and what makes hot work fires more severe; and,
- 5.1.3 explain USI's hot work policy, procedures and responsibilities.

### **5.2 Contractors**

Contractors are required to provide training to their employees that will be involved in performing hot work. Any job where the contractor fails to follow hot work procedures will be shut down until the infraction has been corrected. All contractors must notify the life safety supervisor at USI of any work that will be performed on campus.

## **6.0 RECORD KEEPING**

### **6.1 Hot Work Permits**

All hot work permits shall be returned to Environmental Health and Safety for their record retention. Keep a copy for your file. Records of hot work permits should be maintained for one calendar year. Hot work permits on file should be reviewed for program improvement or modification purposes prior to disposal.

### **6.2 Training**

Copies of training records are maintained in Environmental Health and Safety.

## **7.0 REFERENCES**

- 7.1 Title 29 Code of Federal Regulations, Subpart Q, Welding, Cutting and Brazing (1910.250).
- 7.2 1997 Uniform Fire Code, Article 105.8.h.3.

# APPENDIX A HOT WORK PERMIT