

# **Bloomsburg University of Pennsylvania**

## **Hot Work Safety Program**

### **Effective Date: July 1, 2015**

#### **I. General Overview**

- A. This program is to prevent injury, fire and unnecessary fire alarm activations in a building that results from any temporary hot work operation. This includes, but is not limited to cutting, welding, brazing, grinding, soldering, thawing pipe, torch applied roofing or other similar activities. The welding, cutting, brazing and soldering processes expose workers (employees and contractors) to a variety of hazards including; burns, fire, eye damage, possible lung irritation and damage, electric shock, slips and falls, numerous injuries, deaths and considerable property loss occur each year from the hazards associated with hot work operations in the workplace. Most of these injuries, deaths and property losses are preventable. Prior to planning any hot work a safer alternative/method should be pursued. If not possible, then personnel shall follow this program.
- B. The program shall apply to all Bloomsburg University employees, students and contractors that will complete hot work or assist in the hot work process in any building. The Office of Workplace Safety will ensure that work practices and hot work equipment/operations are evaluated to determine if proper fire safety precautions are instituted. For information on the protection of personnel during hot work operations see Section VII Personal Protection Equipment (PPE) of this program, the University's Personal Protection Equipment program and OSHA Standard 29 CFR 1910.252. This program does not apply to use of open flame (Bunsen Burner) in laboratory experiments or areas that have been designed and equipped for hot work operations.

#### **II. Definitions**

- A. Approved means – listed or approved by a nationally recognized testing laboratory. Refer to 29 CFR 1910.155 for definitions of listed and approved, and 29 CFR 1910.7 for nationally recognized testing laboratory.
- B. Emergency – any unforeseen combination of circumstances or the resulting state that calls for immediate action.
- C. Hot work – Operations including cutting, welding, thermit welding, brazing, soldering, grinding, thermal spraying, thawing pipe, installation of torch-applied roof system or any other similar activity.
- D. Hot work area – The area exposed to sparks, hot slag, radiant heat, conductive heat or convective heat as a result of the hot work.
- E. Hot work equipment – Electric or gas welding or cutting equipment used for hot work.

- F. Hot work permits – Permits issued by designated personnel under the hot work permit procedure permitting welding or other hot work to be done in locations as specified in this procedure.
- G. Torch applied roof systems – Bituminous roofing systems using membranes that are adhered by heating with a torch and melting asphalt back coating instead of mopping hot asphalt for adhesion.
- H. Welder and welding operator – any operator of electric or gas welding and cutting equipment. All other welding terms are used in accordance with American Welding Society.

### III. Responsibilities

- A. Office of Work Place Safety shall be responsible for:
  - 1. Developing a written Hot Work Program and updating the program as necessary.
  - 2. Provide hot work safety training for supervisors and employees.
  - 3. Issuing daily hot work permits.
- B. Management shall be responsible for:
  - 1. Ensuring this program is implemented in those areas under their direction where applicable.
  - 2. Advise all contractors and their sub-contractors about flammable materials or hazardous conditions of which they may not be aware.
  - 3. Educate all contractors and their sub-contractors they employ on the requirements of this program.
- C. Supervisors shall be responsible for:
  - 1. Determining the combustible materials and hazardous areas present or likely to be present, in the work location.
  - 2. Ensuring workers are using safe work practices to prevent injuries resulting from hot work accidents.
  - 3. Ensuring compliance with this program.
  - 4. Selection and purchasing of the worker's personal protective equipment (PPE).
  - 5. Ensuring the worker utilizes the personal protective equipment (PPE).
  - 6. Submitting a Hot Work Application (<http://www.bloomu.edu/safety-workplace-hotwork-permit>) via the Office of Workplace Safety web page.
- D. Contractors shall be responsible for:
  - 1. The inspection and maintenance of their equipment.
  - 2. Ensuring proper function of the equipment before it can be used. If the University discovers improperly functioning equipment then the equipment will not be permitted to be used.
  - 3. Providing the required OSHA training for their employees (including fire extinguisher training).
  - 4. Complying with this site safety program and the OSHA standards to protect life and property of the University.
  - 5. Any and all damages resulting from a failure to comply.
  - 6. Submitting a Hot Work Application (<http://www.bloomu.edu/safety-workplace-hotwork-permit>) via the Office of Workplace Safety web page.

7. Ensure compliance with this program.

E. Hot Work Operator

1. The hot work operator conducting hot work shall be competent, qualified and trained to conduct the hot work. This determination is made by the employee's supervisor. All University employees are required to complete "Hot Work Safety Training" prior to completing any hot work on campus. The employee conducting hot work shall be provided the proper hot work equipment from their respective department.
  - a. The University employee hot work operator shall be responsible for:
    - i. Seeking approval from supervisor to pursue a hot work permit.
    - ii. Conducting hot work in a safe manner.
    - iii. Utilizing safe work practices.
    - iv. Complying with this program.
    - v. Protecting combustibles from ignition.

F. Fire Watch shall be responsible for:

1. Having fire extinguishing equipment readily available and be trained in its use.
2. Being familiar with the emergency procedures for sounding an alarm in the event of a fire.
3. Watch for fires in all exposed areas.
4. Extinguishing fires ONLY when obviously within their trained capabilities and the capacity of the equipment available.
5. Keep watch for fire at least 1 hour after the hot work has been completed.
6. Ensuring the safe conditions are maintained during hot work operations.

IV. Fire Prevention

A. Fire protection Equipment

1. Fire Sprinklers – Automatic sprinkler protection shall not be shut off while hot work is performed. Where hot work is performed close to automatic sprinklers, noncombustible barriers or damp cloth guards shall shield the individual sprinkler heads and shall be removed when the work is completed. If the work extends over several days, the shields shall be removed at the end of each workday.
2. Fire Alarm System – Fire alarm system detection devices shall not be covered or disabled without permission from the Office of Workplace Safety. Manual pull stations will not be disabled. The smoke detectors in the immediate area shall be covered and should be disabled if possible. The only approved methods for covering a detection device is by using nitrile disposable gloves or a dust cover provided by the manufacture of the detection device.
3. Fire Extinguishers - At a minimum 1-10 pound ABC fire extinguisher must be present within 30 feet. Do not relocate a fire extinguisher from somewhere inside a building to satisfy this requirement. Contractors shall provide their own fire extinguishers.

B. Relocation of combustibles

1. All combustibles shall be relocated at least 35 feet from the work site. Where relocation is impracticable, combustibles shall be protected with fire-resistant curtains or metal guards.

C. Partitions

1. Partitions segregating hot work areas from other areas of the building shall be noncombustible, such as welding curtains. When the hot work area is screened in on all sides, the screens shall be arranged so that no serious restriction of ventilation exists. Partitions shall prevent the passage of sparks, slag and heat from the hot work area. Sparks can travel as much as 35 feet and spatter can bounce on the floor or fall through openings creating hazards in other work areas of our facility.

D. Openings

1. Openings or cracks in walls, floors, ducts or shafts within the hot work area shall be tightly covered to prevent passage of sparks to adjacent combustible areas or shielded by metal fire-resistant guards or curtains shall be provided to prevent passage of sparks or slag. Where ever there are floor openings or cracks in the flooring that cannot be closed, precautions shall be taken so that no readily combustible materials on the floor below will be exposed to sparks, which might drop through the floor. A properly trained fire watch person shall monitor the floor below during the operation and for 1 hour after termination of the work being performed. The same precautions shall be observed with regard to cracks or holes in walls, open doorways and open or broken window.

E. Floors

1. All floors shall be swept clean and kept clean for a radius of 35 feet. Combustible floors shall be kept wet, covered with damp sand or protected by fire-resistant shields. Where floors have been wet down, personnel operating arc welding or cutting equipment shall be protected from possible shock. Fixed hot work areas shall have floors with noncombustible surfaces.

F. Combustible walls/ceilings

1. Where hot work is done near walls, partitions, ceilings or on a roof of combustible construction; fire-resistant shields or guards shall be provided to prevent ignition.
2. Welding shall not be attempted on a metal partition, wall, ceiling or roof having a combustible covering or on walls or partitions of combustible sandwich-type panel construction.

G. Noncombustible walls

1. If welding is to be done on a metal wall, partition, ceiling or roof, precautions shall be taken to prevent ignition of combustibles on the other side, due to conduction or radiation, preferably by relocating combustibles. Where combustibles are not relocated, the fire watch will monitor the opposite side of the wall from where the work is being conducted.

#### H. Pipes

1. Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings or roofs shall not be undertaken if the work is close enough to cause ignition by conduction.

#### I. Welding or cutting containers

##### 1. Container

- a. Hot work shall not be performed on containers or equipment that contains or has contained flammable/combustible liquids, gases or solids until the containers and equipment have been thoroughly cleaned, inerted or purged; except that "hot tapping" shall be allowed on tanks and pipe lines when such work is to be conducted by approved personnel. Any pipe lines or connections to the drum or vessel shall be disconnected or blanked.

##### 2. Venting and purging

- a. All hollow spaces, cavities or containers shall be vented to permit the escape of air or gases before preheating, cutting or welding. Purging with inert gas is recommended.

#### J. Confined Spaces

##### 1. Cylinders

- a. Keep all cylinders outside the confined space and properly secured to prevent from falling.

##### 2. Cutting or Welding

- a. In order to eliminate the possibility of gas escaping through leaks or improperly closed valves, when gas welding or cutting, the torch valves shall be closed and the gas supply to the torch positively shut off at the cylinders. The lines should also be purged whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight. Where practicable, the torch and hose shall also be removed from the confined space.
- b. When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine be disconnected from the power source.
- c. Confined space entry permit is always required even if the space is considered a non-permit required confined space due to the hot work hazard.

#### V. Prohibited Areas

- A. Hot work shall not be permitted in the following situations, unless approved by the Office of Workplace Safety.

1. In areas not authorized by the Office of Work Place Safety.

2. In areas where the sprinkler system is impaired.
3. In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or explosive atmospheres that may develop inside uncleaned or improperly prepared tanks or equipment which have previously contained such materials or that may develop in areas with an accumulation of combustible dust.
4. In areas with readily ignitable materials, such as storage of large quantities of bulk sulfur, baled paper, cotton, lint, duct or loose combustible materials.

#### VI. Fire Watch

A. Fire watches are required whenever hot work activities are performed in locations where a minor fire might develop or any of the following conditions exist:

1. Appreciable combustible material, in building construction or contents, closer than 35 feet to the point of operation.
2. Appreciable combustibles are more than 35 feet away but are easily ignited by sparks.
3. Wall or floor openings within a 35 foot radius expose combustible material in adjacent areas including concealed spaces in walls or floors.
4. Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings or roofs and are likely to be ignited by conduction or radiation.

B. Duration

1. A fire watch shall be conducted during the entire hot work activities and at least one (1) hour after completion of the hot work to detect and extinguish possible smoldering fires. After the required one (1) hour fire watch the hot work area may be monitored for an additional 3 hours, as conditions may warrant additional coverage/inspections. This can be accomplished by use of the automatic fire alarm system (if present), closed circuit television (CCTV) or by contractor conducting rounds of the area.

C. Duties

1. Constantly monitor the hot work area and adjacent areas;
2. Watch for stray sparks, smoldering fires or other hazards that may be present;
3. Keep all combustibles at least 35 feet away from the hot work area;
4. Keep all fire doors in the area closed;
5. Communicate clearly to the hot work operator;
6. Keep a minimum of one 10 pound ABC rated fire extinguisher within 30 feet from the hot work area. Do not relocate an extinguisher from within the building;
7. Use a fire extinguisher to extinguish small fires within the capabilities of the fire watch and equipment; and
8. Initiate the emergency procedures.

D. Location

1. The fire watch shall include the entire hot work area. Hot work conducted in areas with vertical or horizontal fire exposures that are not observable by a

single individual shall have additional personnel assigned to fire watches to ensure that exposed areas are monitored.

E. Fire extinguisher training

1. The individual responsible for performing the hot work and individuals responsible for providing the fire watch shall be trained in the use of portable fire extinguishers. This training must be provided by the contractor's employer prior to the start of hot work.

F. Fire extinguishers

1. A suitable fire extinguisher shall be maintained in a state of readiness for instant use. A minimum of one 10 pound ABC rated portable fire extinguisher shall be readily accessible within 30 feet of the location, where hot work is performed. Contractors shall provide their own suitable fire extinguisher.

G. Emergency Procedures - In the event of a fire emergency the person conducting the hot work and the person conducting fire watch shall:

1. Immediately stop all hot work operations.
2. Immediately activate the building fire alarm.
3. Assist occupants in the immediate area.
4. Attempt to extinguish the fire, if possible.
5. Evacuate the building.
6. Call Campus Police at 570-389-2211

VII. Personal Protective Equipment

A. Selection

1. Selection of the appropriate PPE and ventilation should be made based on OSHA 29 CFR1910.252. If assistance is needed with the selection, contact the Office of Workplace Safety.

B. Purchasing

1. Purchasing of personal protective equipment shall be purchased by the employee's department.

C. Maintenance

1. All PPE shall be used and maintained in accordance with the manufacturer's recommendations. It shall also be kept in a sanitary and reliable condition.

D. Eye and Face Protection

1. Safety glasses or goggles and face shields shall be worn by welders. Spectacles without side shields, with suitable filter lenses are permitted for use during gas welding operations on light work, for torch brazing or for inspection. Helpers and fire watch personnel shall wear eye and face protection, as appropriate.
2. Welders should select the proper shading based on the chart in OSHA CFR1910.252(b)(2)(ii)(H).

E. Head Protection

1. Helmets which protect the face, neck and ears from direct radiant energy shall be worn during all welding and cutting operations.

F. Protective Clothing

1. The size, nature and location of the hot work will determine the extent of the protective clothing required.
- G. Ventilation
  1. Adequate ventilation should be used, especially when cutting or welding materials with painted or metal coated surfaces.
- H. Hearing/respiratory
  1. Hearing and respiratory may be required when performing overhead work or in confined spaces. Contact the Office of Workplace Safety for guidance.
- I. Fall Protection
  1. Working from heights, platforms, scaffolds or open sided floors the worker must be protected from a fall with a guardrail, lifeline system or a safety harness with lanyards. When welding from these elevations, welding cables or hoses must be kept clear of the passageways, ladders and stairways.
- VIII. Permit Procedure
  - A. Authorization
    1. All hot work permits on campus will be issued by the Office of Workplace Safety. For after-hours emergency repairs contact the Office of Workplace Safety at 570-441-4631 or 570-204-8772. Only the Office of Workplace Safety can issue hot work permits.
    2. All initial requests for a hot work permit shall submit a Hot Work Application ( ) via the Office of Workplace Safety web page. This submittal is necessary to evaluate the work area, to determine if any fire alarm system devices need to be de-activated and to ensure staff will be available on the day of the hot work. The responsible university employee shall submit the fire protection impairment request at least 48 hours in advance.
    3. All outside contractors and their sub-contractors must follow the same procedure as listed in number 2 of this section. Submitting the request does not constitute authorization to do hot work or to have the smoke detectors turned off.
    4. All university employees conducting hot work must work through their supervisor to have the request submitted. Submitting the application for a Hot Work permit does not constitute authorization to do hot work or to have the smoke detectors turned off.
    5. Once the application is received, the Office of Workplace Safety will review it for any fire protection and life safety issues and will contact the requestor with concerns. The contractor or employee shall contact the Office of Workplace Safety each day if they need a hot work permit or need the smoke detectors turned off, beyond their initial request. The Office of Workplace Safety will meet with the contractor and conduct the mandatory pre-hot work check.
  - B. Pre-Hot work check
    1. Before any hot work is permitted the area shall be inspected by the Office of Workplace Safety.
    2. The Office of Workplace Safety may designate precautions to be followed in granting authorization to proceed.



3. Permission will be granted in written form on a "Hot Work" permit.
  4. The permit will be completed and signed after the pre-hot work check of the site. The office of Workplace Safety will retain the top sheet of the permit and the back portion of the permit shall be displayed at the work site in a conspicuous place to warn others of hot work before they enter the "hot work area".
- C. Post-hot work check
1. After completing the required 1 hour fire watch, the contractor or employee shall call the Office of Workplace Safety to have the smoke detectors turned back on and the hot work area checked.
  2. The Office of Workplace Safety will meet with the contractor or employee, check the area for damage or smoldering fires. Have the electrician turn on the fire alarm devices and retrieve the hot work permit.
  3. The contractor or employee is then free to leave the area.
- D. Duration of Hot Work Permits
1. Conditions in the buildings change very frequently therefore hot work permits will only be issued daily (No week or month long permits).
- E. Process Overview
1. Determine if a safer solution is available for work.
  2. If not, notify the Office of Workplace Safety of the need for hot work permit.
  3. Contractor or employee submits application for the need to conduct hot work and to disable fire alarm detection devices at least 48 hours in advance.
  4. Office of Workplace Safety arrives and inspects the hot work area. If approved, they issue the hot work permit and arranges for the appropriate fire alarm detection devices to be disabled.
  5. Worker conducts the hot work safely and the required fire watch is conducted.
  6. After completion, worker contacts the Office of Workplace Safety to request the post-hot work check and the fire alarm detection devices enabled.
  7. The Office of Workplace Safety arrives and inspects the hot work area, collects the hot work permit and has the electrician re-enables the fire alarm detection devices.
  8. Contractor or employee is then free to leave.