

# Hot Work Safety Program & Procedures

October - 2021

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## OVERVIEW

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Hot work operations are frequently performed on the Abilene Christian University (ACU) campus. Hot work operations can include activities such as welding, brazing, grinding, torch cutting, and torch soldering. Heat, sparks, and hot slag produced by these hot work operations create a significant risk and potential of igniting flammable and combustible materials. The adherence to the procedures and guidelines within this policy is imperative to the prevention of fires caused by hot work operations.

ACU has developed this policy in accordance with the laws and regulations promulgated by OSHA (Occupational Safety and Health Administration) and the NFPA (National Fire Protection Association).

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## POLICY

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All staff, faculty, students, and contractors whose work is under the supervision of Abilene Christian University shall comply with this policy. Failure to comply with this policy or the laws and regulations referenced within this policy may result in disciplinary action up to and including termination.

## References

OSHA 29 CFR 1910 Subpart Q

OSHA 29 CFR 1926 Subpart J

NFPA 51B

2009 International Fire Code (AHJ)

ANSI/FM 4950

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# DEFINITIONS

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Authority Having Jurisdiction (AHJ) - The City of Abilene is the authority having jurisdiction and is responsible for enforcing the requirements of the applicable codes and regulations, approving equipment, materials, new installations, or procedures when applicable. The City of Abilene has adopted the 2009 International Fire Code.

Designated Area - A specific location designed and approved for hot work operations that is maintained fire-safe, such as a maintenance shop or a detached outside location, that is of noncombustible or fire-resistive construction, free of combustible and flammable contents, and suitably segregated from adjacent areas.

Fire Monitoring - All provisions that are implemented to provide early warning and detection of smoldering fire conditions in the hot work area. NFPA 51B requires a 60 minute minimum for fire monitoring upon completion of hot work when applicable.

Fire Protection System - Any fire alarm device or system or fire-extinguishing device or system, or combination thereof, that is designed and installed for detecting, controlling or extinguishing a fire or otherwise alerting occupants, or the fire department, or both, that a fire has occurred.

Fire Watch - A qualified person or persons responsible for continuously observing the hot work area, maintaining fire-safe conditions, and responding to emergencies during hot work operations and in the established period following the completion of the hot work.

Hot Work - Work involving burning, welding, or a similar operation that is capable of initiating fires or explosions.

Hot Work Permit - A permit that is authorized by the permit authorizing individual that allows hot work to be performed. A hot work permit shall be reviewed and posted at the hot work area prior to hot work being performed. All hot work permits are only authorized and valid for the day it was issued.

Hot Work Operator (HWO) - A qualified person or persons responsible for performing hot work operations, handling equipment safely, and performing hot work so as to not endanger lives or property.

Management - For the purpose of this policy, management shall include owners, contractors, educators, directors, supervisors, or designated agents, who are responsible for hot work operations.

Nonpermissible Areas - Areas that have been determined to be too unsafe for hot work to be performed.

Permit Authorizing Individual - An individual designated by management to authorize hot work.

Permit Required Area - Any location other than a designated area that is approved for hot work and is made fire-safe by removing or protecting combustibles from ignition sources.

Welding and Allied Processes - Processes such as arc welding, oxy-fuel gas welding, open-flame soldering, brazing, thermal spraying, oxygen cutting, and arc cutting.

Welding Blanket - A heat-resistant fabric designed and approved to be used in the area of hot work operations. Welding blankets are to be used in horizontal applications, such as covering equipment, machinery, or combustibles that cannot be removed from the hot work area.

Welding Curtain - A heat-resistant fabric designed and approved to be used in the area of hot work operations. Welding curtains are to be used in vertical applications to prevent light to moderate exposures from hot work such as chipping, grinding, heat treating, sand blasting, and light horizontal welding. Welding curtains are designed to prevent sparks from escaping the hot work area.

Welding Pads - A heat-resistant fabric designed and approved to be used in the area of hot work operations. Welding pads are to be placed directly under hot work operations such as welding or cutting. Welding pads are to be used in horizontal applications with severe exposures such as that resulting from molten substances or heavy horizontal welding.

# ROLES & RESPONSIBILITIES

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## Faculty/Staff

Faculty and Staff shall adhere to the procedures and guidelines of this policy. Employees shall report any violation of this policy to their immediate supervisor, management, or to the office of Institutional Compliance & Risk Management ([risk@acu.edu](mailto:risk@acu.edu) or 325-674-6142).

## Management

Management shall be responsible for the safe operations of hot work activity and for ensuring that the procedures and guidelines of this policy are adhered to within their departments. Management responsibilities include, but are not limited to:

- Establishing designated areas for hot work
- Designating a permit authorizing individual
- Ensuring that all equipment is examined to ensure safe operations
- Ensuring that only approved apparatuses and equipment are used (torches, manifolds, regulators, acetylene generators)
- Ensuring that all individuals involved in the hot work operations adhere to the standards in this policy
- Ensuring that all individuals involved in hot work operations are trained in the safe operation of their equipment
- Management shall advise contractors about any site-specific flammable materials, hazardous processes or conditions, or any other potential fire hazard

## Divisions/Departments

All ACU divisions/departments that perform hot work operations shall follow the procedures and guidelines of this policy. Adherence to this policy is of the utmost importance to the safety and well being of our students, faculty, staff, and our community.

## Contractors

All contractors who perform work on the ACU campus are required to follow their own hot work safety policies and procedures. All hot work performed shall be in accordance with all applicable state, federal and local laws and regulations.

A Memorandum of Agreement (MOA) with the subject of "Fire Safety Guidance" shall be completed and signed by a representative of the Contractor/Company, the Associate Vice President of Operations, and the Director of the Office of Institutional Compliance and Risk Management prior to hot work being performed.

In the event that Abilene Christian University is the general contractor, all hot work performed shall be in accordance with the procedures and guidelines found in this policy.

## Environmental Health and Safety Manager

The Environmental Health and Safety Manager can be reached at [risk@acu.edu](mailto:risk@acu.edu) or 325-674-2424 and is responsible for the review and maintenance of this policy. The Environmental Health and Safety Manager additional responsibilities include, but are not limited to:

- Assigning safety training as needed or applicable
- Inspecting hot work sites as needed
- Auditing hot work processes
- Has stop work authority

## Hot Work Team

### Hot Work Operator (HWO)

(Examples of Hot Work Operators: Individuals who weld, cut, braze, solder, grind, etc.)

- Only accept jobs they are qualified to perform
- Inspects work site prior to beginning hot work
- Shall not start prior to a permit being approved & posted
- Reviews permit
- Should verify atmospheric testing (if applicable)
- Must stop work if conditions changes and/or the site becomes unsafe
- Has stop work authority

### Permit Authorizing Individual (PAI)

(Examples of Permit Authorizing Individuals: Members of Management who have been trained as described within this hot work safety program, EHS Manager)

- Inspects hot work site
- Authorizes hot work: signs and posts permits
- Cannot be the same as the Hot Work Operator (HWO)
- Ensures hot work is away from combustibles
- Recognizes changed conditions
- Ensures fire watch is present when applicable or necessary
- Considers alternatives to hot work if possible
- Considers the type(s) of Personal Protective Equipment (PPE)
- Has stop work authority

### Fire Watch

(Examples of Fire Watch: Individual(s) who have been designated by Management, have experience or an understanding of the operation, and are trained as described within this hot work safety program)

- Keeps watch during & after hot work
- Reviews permit
- Looks out for smoldering or fires
- Has fire extinguishing equipment readily available and is trained in its use
- Keeps people away from hot work area
- Ensures conditions do not change
- Has stop work authority

# PROCEDURES

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The following procedures shall be reviewed and adhered to prior to any hot work operation being performed.

## Designated Areas

Designated areas can be used for hot work operations without the requirement of a hot work permit. The following requirements must be met for a location to qualify as a designated area:

- The location is fire resistant
- Combustibles are or can be relocated at least 35 ft (11m) in all directions away from the hot work area
- Fire Extinguishers are in working condition and readily available for use
- Ventilation is working properly
- Equipment is maintained and is in proper working condition

Initial assignment of a permanent designated area can only be authorized and approved by the Environmental Health & Safety Manager ([risk@acu.edu](mailto:risk@acu.edu) or 325-674-2424).

Permanent designated areas shall be inspected and reviewed at least annually by the Environmental Health & Safety Manager.

Signs shall be posted designating hot work areas. Signs will be provided by the Office of Institutional Compliance & Risk Management ([risk@acu.edu](mailto:risk@acu.edu)) upon the designation of an approved hot work area.

## Non-Permissible Areas

There are some locations where hot work is non-permissible due to conditions that create risk of injury or damage to property. The following locations have been determined to be non-permissible:

- In areas not authorized or in areas determined to be unsafe
- In sprinklered buildings where the entire sprinkler system is impaired unless additional precautions are taken as determined by the Permit Authorizing Individual or the Authority Having Jurisdiction.
- When an entire building fire detection system is shut down.
- In the presence of explosive atmospheres where mixtures of flammable gases, vapors, liquids, or dusts may exist.
- In improperly prepared tanks or equipment which have previously contained flammable gases, vapors, liquids or dusts that could create an explosive atmosphere.
- In areas near the storage of large quantities of exposed, readily ignitable materials, such as sulfur, baled paper, or cotton.

## Permit Required Areas

Some areas require a hot work permit prior to hot work being performed. Only a Permit Authorizing Individual can issue a hot work permit. A hot work permit will be required when the following conditions have been met:

- There is no other acceptable alternative to hot work
- The hot work cannot be performed in a designated area as defined within this policy
- The hot work is not to be performed in a non-permissible area as defined within this policy

A decision tree to help determine if a hot work permit is required can be found in Appendix A of this policy.

## Hot Work Permit Process

If it is been determined that a hot work permit is required, the following procedures shall be used in the sequence set forth below:

- 1) It has been determined that a hot work permit is required.
- 2) The Hot Work Operator (HWO) will inspect the area where the hot work is to be performed for any hazards.
- 3) The Hot Work Operator will then contact a Permit Authorizing Individual (PAI). (A contact list of Permit Authorizing Individuals is located in Appendix D of this policy.)
- 4) The Permit Authorizing Individual (PAI) will inspect the area where the hot work is to be performed to ensure that the area is both safe and compliant (section B of hot work permit, Appendix C).
- 5) The Permit Authorizing Individual will then complete the Hot Work Permit form that is found in Appendix C of this policy.
- 6) The Permit Authorizing Individual will ensure that a Fire Watch is posted when applicable. In some cases, more than one Fire Watch will need to be posted.
- 7) Upon the completion of the inspection of the hot work area, and all safety precautions have been satisfied, the Permit Authorizing Individual (PAI) shall authorize, sign, and post the Hot Work Permit at the site where the hot work is to be performed.
- 8) Once the permit has been authorized and posted by the Permit Authorizing Individual (PAI), the Hot Work Operator can begin hot work. The hot work permit is only valid for the day of authorized work.
- 9) Upon completion of the hot work, the Hot Work Permit shall be returned to the Permit Authorizing Individual.
- 10) The Hot Work Permit will then be filed and retained for 12 months from the date of completion.

***NOTE: The hot work permit shall not be valid for a time period exceeding 24 hours. A new hot work permit will need to be authorized if the hot work operation is expected to exceed 24 hours.***

## Fire Watch and Fire Monitoring

A fire watch shall be required by the Permit Authorizing Individual or the Authority Having Jurisdiction when hot work is going to be performed in a location where other than a minor fire might develop or if any of the following conditions exists:

- Combustible materials in building construction or contents are closer than 35 ft (11m) to the hot work operation
- Combustible materials are more than 35 ft (11m) away from the hot work operation but easily ignited by sparks
- Wall or floor openings within a 35 ft (11m) radius of the hot work operation that 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 may become ignited

The duration of the fire watch shall be determined by the Permit Authorizing Individual or the Authority Having Jurisdiction. NFPA 51b requires a fire watch to be maintained for no less than 60 minutes upon completion of the hot work operation.

In some situations, more than one fire watch may be necessary if combustible materials that could be ignited by the hot work operation cannot be directly observed by one fire watch. (Example: Sparks or slag that can fall



below the level of the hot work operation will require a second fire watch on the level below if there are combustible materials present.)

Additional fire monitoring beyond the required 60 minutes may be determined as necessary by the Permit Authorizing Individual or the Authority Having Jurisdiction.

Additional fire monitoring can be accomplished by any of the following methods:

- Personnel working in the area
- Automatic smoke detection
- Security or maintenance personnel performing rounds through the hot work area every 30 minutes
- Security cameras with smoke or fire detection

A decision tree of when a fire watch is required can be found in Appendix B of this policy.

## Personal Protective Equipment and Clothing

All personal protective equipment and clothing shall be selected to minimize the potential for ignition, burning, trapping hot sparks, and electrical shock.

All personal protective equipment must be inspected for defects prior to use.

For questions or assistance regarding personal protective equipment or clothing, please contact the Office of Institutional Compliance & Risk Management at [risk@acu.edu](mailto:risk@acu.edu).

## Operations that Do NOT Require a Hot Work Permit

Some operations may produce flames, sparks, or slag, but do not require a Hot Work Permit. These operations include:

- Cooking operations
- Electric soldering irons
- Fixed grinding wheels
- Bunsen burners in laboratories

If you are uncertain if a type of work requires a hot work permit, please contact the Environmental Health and Safety Manager at [risk@acu.edu](mailto:risk@acu.edu) or 325-674-2424.

***NOTE: Any operation that produces flames, sparks, or slag that could potentially ignite combustible materials should be handled with the utmost care and performed with fire safety as a priority.***

## Shielding

Shielding such as welding blankets, welding curtains, or welding pads shall be used when it has been determined necessary to prevent accidental ignition of combustibles.

Welding blankets, welding curtains, and welding pads shall be used in accordance with ANSI/FM 4950.

# GENERAL SAFETY

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The following precautions shall be used as general safety guidelines during any hot work operation:

## **Remove electrodes, unplug machine(s)**

- Electrodes should be relocated to avoid accidental contact whenever operations have become suspended for a substantial period (change of shift, lunch breaks, overnight). Disconnect all hot work machinery from its power source.

## **Close torch valves, shut off gas supply**

- Torch valves should be closed and gas supplies should be shut off whenever the torch is not in use for a substantial period (change of shift, lunch breaks, overnight).

## **Locate equipment to avoid hazard(s)**

- All equipment (welding equipment, machines, cable, etc.) should be located in a place that does not create a hazard to others.

## **Post signs**

- Signs should be posted to identify areas that are to be designated for welding and hot work. These signs are essential to notifying personnel that PPE is required in these designated areas.

## **Protect workers with screens**

- Hot work screens are used to shield and protect other workers that are adjacent to the hot work that is being performed from radiant energy and weld spatter.

## **Label hot material**

- Any material that may retain heat after hot work is completed should be labeled to prevent accidental contact.

## **Avoid confined spaces**

- Gas cylinders and welding power sources should be located outside of confined spaces.

## **Secure portable equipment**

- Portable equipment should be mounted and secured to prevent accidental movement.

## **Secure cylinders**

- Gas cylinders should be secured while performing hot work to prevent the cylinders from being knocked over.

**Locate gas cylinders away from hot work**

- Gas cylinders should be located far enough away to prevent sparks, slag, or flame from reaching the cylinders. If this cannot be achieved, fire resistant shields (pads, curtains, or blankets) will need to be used.

**Keep a clean and orderly work area**

- Good housekeeping is a key component of safety. Maintaining a clean and orderly work area free of rags, paper, wood, or other combustible materials will help prevent accidental fires and prevent injuries.

# TRAINING

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## Environmental Health & Safety Training

All individuals who are involved in the hot work process or are responsible for areas that perform hot work are required to complete hot work training. These individuals include, but are not limited to:

- Anyone who performs, supervises, or delegates hot work
- Permit Authorizing Individuals (PAI)
- Hot Work Operators (HWO)
- Fire Watch personnel

The following trainings must be completed prior to a person being qualified for any hot work function:

- Hot Work Permit Training - required upon initial assignment of hot work functions and a refresher training shall be provided once every three years.
- Fire Extinguisher Training - required upon initial assignment of hot work functions and continued annually thereafter.

The Director of the department will make contact with the Environmental Health & Safety Manager at [risk@acu.edu](mailto:risk@acu.edu) to schedule training for all applicable employees.

These training requirements will be maintained and reviewed by the Environmental Health & Safety Manager.

## Departmental Training

Supervisors and management are responsible for training their employees in Hot Work Permit procedures as described within this policy and any departmental safety procedures that are specific to their department or work area. This training shall be completed upon initial assignment of a position that is exposed to hot work. This training shall include, but is not limited to:

- Required personal protective equipment
- Safety procedures for the equipment to be used
- Contact information of all Permit Authorizing Individuals (PAIs)
- Locations of designated areas for hot work (no hot work permit required)
- Where to find and file copies of completed hot work permits

The Environmental Health & Safety Manager ([risk@acu.edu](mailto:risk@acu.edu)) may be used as a resource to help provide training or training resources.

# PROGRAM REVIEW

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This hot work program and the procedures within this program shall be reviewed annually by the Office of Institutional Compliance & Risk Management.

## **RECORDKEEPING**

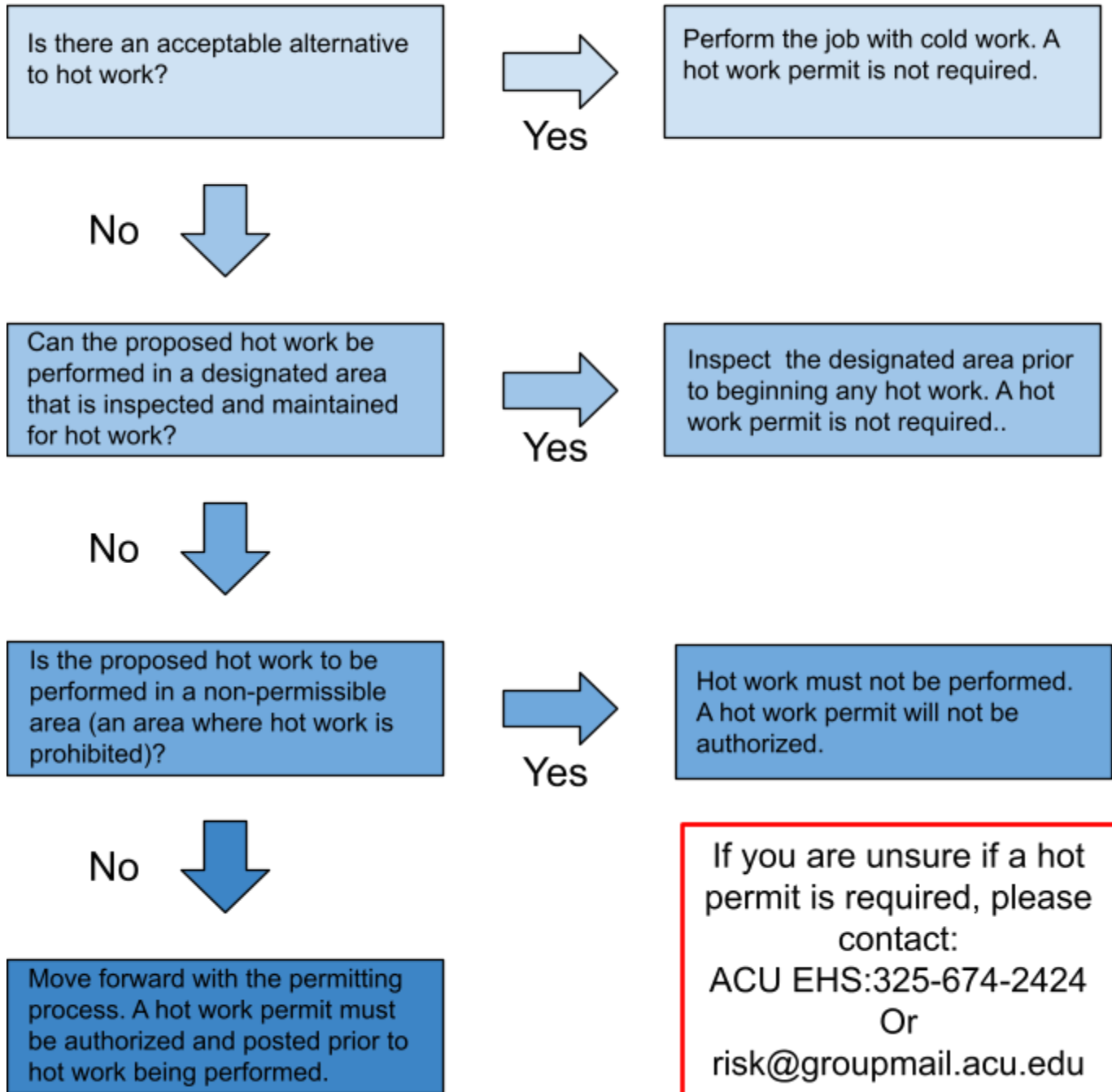
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Departments shall retain all authorized hot work permits for 12 months.

## **APPENDIX**

## Appendix A

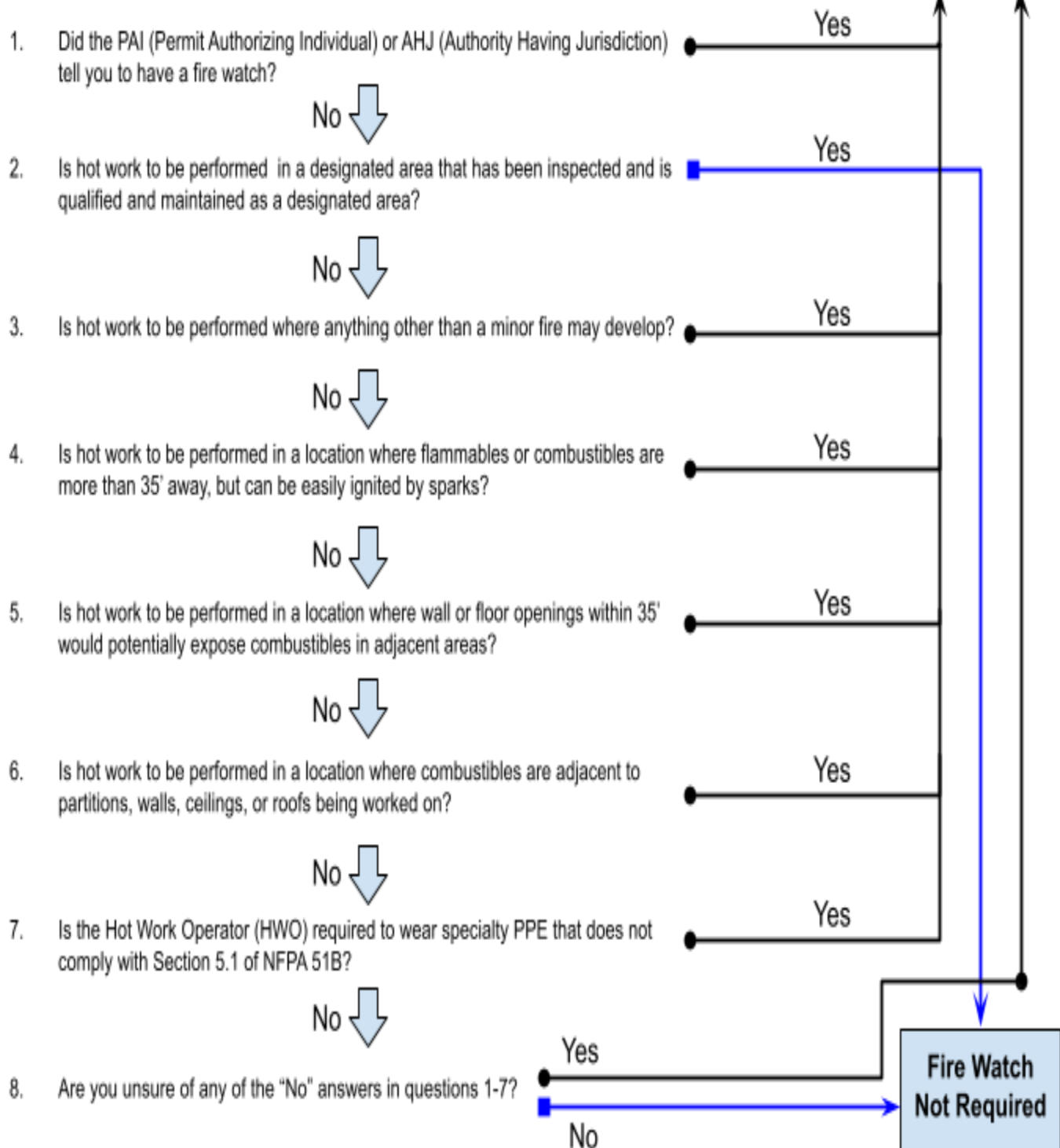
### Do I Need a Hot Work Permit?





## Appendix B

### Is a Fire Watch Required?



## Appendix C

# HOT WORK PERMIT

### **Seek an alternative/safer method if possible!**

(Examples: ♦ Screwed, flanged or clamped pipe ♦ Manual hydraulic shears ♦ Mechanical Bolting or pipe cutting.)

Before initiating hot work, ensure precautions are in place as required by NFPA 51B, 2009 International Fire Code, 29 CFR 1910 Subpart Q, 29 CFR 1926 Subpart J, and ANSI Z49.1.

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#### **Section A - Permit Information**

*To be completed by the Job Supervisor or Person(s) performing Hot Work*

Date: \_\_\_\_\_ Time Started: \_\_\_\_\_ Time Completed: \_\_\_\_\_

Location (Address, Building, Room, Floor): \_\_\_\_\_

Type of work to be performed (welding, cutting, etc.) \_\_\_\_\_

#### **Hot Work being performed by:**

- ☐ Employee of ACU  
☐ Contractor - Name of Contractor \_\_\_\_\_

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Name (Print) & Signature of Person(s) Performing Hot Work \_\_\_\_\_

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Name (Print) & Signature of Job Supervisor \_\_\_\_\_

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Name (Print) & Signature of Person Performing Fire Watch  
(if applicable) \_\_\_\_\_

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**This permit is only valid on the date listed above for the person(s) performing the Hot Work listed above.**

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#### **Section B - Required Precaution Checklist**

*To be completed by the Permit Authorizing Individual(PAI)*

*Person(s) performing the Hot Work must review this permit prior to performing work.*

#### **Preliminary precautions**

- ☐ Available sprinklers, hose streams, and appropriate extinguishers are in service and operable.  
☐ Hot work equipment is in good working condition in accordance with manufacturer's specifications.  
☐ Special permission obtained to conduct hot work on metal vessels or piping lined with rubber or plastic.

#### **Requirements within 35 ft (11 m) of hot work**

- ☐ Flammable liquid, dust, lint, and oily deposits removed.  
☐ Explosive atmosphere in the area is eliminated.  
☐ Floors swept clean and trash removed.  
☐ Combustible floors wet down or covered with damp sand or fire-resistive/noncombustible materials or equivalent.  
☐ Personnel protected from electrical shock when floors are wet.  
☐ Other combustible storage material removed or covered with listed or approved materials (welding pads, blankets, or curtains; Fire-resistive tarpaulins), metal shields, or noncombustible materials.  
☐ All wall and floor openings covered.  
☐ Ducts and conveyors that might carry sparks to distant combustible material covered, protected, or shut down.

**Requirements for hot work on walls, ceilings, or roofs**

- ☐ N/A
- ☐ Construction is noncombustible and without combustible coverings or insulation.
- ☐ Combustible material on the other side of walls, ceilings, or roofs is moved away.

**Requirements for hot work on enclosed equipment**

- ☐ N/A
- ☐ Enclosed equipment is cleaned of all combustibles.
- ☐ Containers are purged of flammable liquid/vapor.
- ☐ Pressurized vessels, piping, and equipment removed from service, isolated, and vented.

**Requirements for hot work fire watch and fire monitoring**

- ☐ N/A
- ☐ Fire watch will be provided during and for a minimum of 1 hour (60 minutes) after hot work, including any break activity.
- ☐ Fire watch is provided with suitable extinguishers and, where practical, a charged small hose.
- ☐ Fire watch is trained in use of equipment and in sounding alarms.
- ☐ Fire watch is required in adjoining areas, above and below.

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**Section C - PAI Verification and Permit Authorization**

*To be completed by the Permit Authorizing Individual (PAI)*

**AUTHORIZATION:** I verify that the location listed on this permit has been examined, the precautions marked on the checklist have been taken, and the job supervisor and person(s) performing the hot work has reviewed this permit.

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Signature of Permit Authorizing Individual (PAI)

\_\_\_\_\_  
Date

**WARNING!**

**HOT WORK IN PROGRESS  
WATCH FOR FIRE!**

**IN CASE OF EMERGENCY:**

1. EXTINGUISH FIRE WITH PORTABLE EXTINGUISHER IF POSSIBLE.
2. NOTIFY PERSONNEL IN IMMEDIATE AREA TO EVACUATE.
3. IF APPLICABLE, INITIATE BUILDING ALARMS BY ACTIVATING PULL STATIONS.
4. CALL 911

**EMERGENCY NUMBERS:**

911  
ACU POLICE: 325-674-2305  
ACU EHS: 325-674-2424

## Appendix D

### Contact Information

Emergency Services	
Name	Phone Number
<u>Abilene Fire Department</u> Non-Emergency Emergency	(325) 676-6676 911
<u>Abilene Police Department</u> Non-Emergency Emergency	(325) 673-8331 911
ACU Medical Clinic	(325) 674-2625
Hendrick Medical Center	(325) 670-2000

Abilene Christian University	
Name	Contact Information
ACU Police Department	(325) 674-2911 (325) 674-2305
<u>Environmental Health &amp; Safety Manager</u> Zach Harmon	(325) 674-2424 / <a href="mailto:zjh21a@acu.edu">zjh21a@acu.edu</a>
<u>Institutional Compliance &amp; Risk Management</u>	<a href="mailto:risk@acu.edu">risk@acu.edu</a>

Permit Authorized Individuals		
Name	Phone	Email
Zach Harmon	(325) 674-2424	<a href="mailto:zach.harmon@acu.edu">zach.harmon@acu.edu</a>