Hot Work Safety

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0.1	*June, 2011*	*Initial Draft*
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Purpose

The purpose of this Guide is to provide information regarding welding and other hot work. This Guide is designed to comply with Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910 Subpart Q: *Welding, Cutting, and Brazing* and International Fire Prevention Code (Virginia Statewide Fire Prevention Code Chapter 26: *Welding and Other Hot Work*).

Scope

This Guide applies to all University of Virginia personnel who perform hot work. A *Hot Work Permit* must be completed at least 48-hours in advance of planned hot work projects and as soon as possible for emergency hot work tasks.

Responsibilities

This *Hot Work Guide* is a cooperative effort between the Facilities Management Occupational Health and Safety Team, supervisors, and Facilities Management personnel from the departments Customer Service, HVAC, and the Fire Alarm shop. Specific responsibilities relating to the *Hot Work Guide* are outlined below.

Occupational Health and Safety Office:

- Upon request, assess potential hot work to assist with determining the need for a permit.
- Inspect hot work areas as necessary to assist with compliance.
- Conduct atmospheric monitoring when flammable gasses or hazardous atmospheres are suspected.
- Immediately stop all hot work operations that are unsafe or have not properly complied with this guide.
- Provide *Fire Extinguisher Training*.

Supervisors:

- Ensure that cutters or welders are suitably trained in the safe operation of their equipment and fire extinguishers.
- Establish designated areas for hot work that is conducted on a routine basis.
- Ensure that designated areas are free of hazards and are appropriately designed.
- Ensure proper communication between the employee doing the hot work, the fire alarm technician, and the HVAC technician.
- Determine the combustible materials and hazardous areas present or likely to be present in the work location.
- Ensure routine operations are suspended during hot work, if they may create a greater hazard.
- Advise employees and contractors of flammable materials or hazardous conditions that exist in areas where hot work will be conducted.
- Ensure that fire protection and extinguishing equipment are properly located at the hot work location.
- Ensure that fire watches are provided.
- Inspect the work area prior to authorizing emergency hot work operations.
- Ensure proper personal protective equipment (PPE) is available to employees performing hot work.
- Ensure that welding operators fill out and submit a Hot Work Permit.
- Maintain closed Hot Work Permits for one year for inspection by FM-OHS

Heating Ventilating and Air Conditioning (HVAC):

- Evaluate HVAC systems prior to beginning hot work and schedule shutdowns or modifications in coordination with *Hot Work Permits* and hot work activities.
- Fill out HVAC section on *Hot Work Permit* and sign in appropriate location.
- Notify building occupants and EHS of HVAC shutdown, as appropriate.
- Return HVAC systems to normal working conditions upon completion of hot work.

- In buildings containing laboratories, contact EHS-Laboratory Safety and occupants PRIOR to shutdown to allow for proper storage of chemicals and non-disruption of research.

Fire Alarm Technicians:

- Fire alarm technicians are required to disable alarms as necessary. The "Automatic Fire Detection Disabled" check box on the *Hot Work Permit* must be initialed by a representative of the responsible shop before work is started.
- Notify building occupants as necessary.
- Reactivate fire detection upon completion of hot work operation.

Employees (Hot Work Equipment Operators):

- Complete and maintain appropriate training qualifications required to perform hot work to include Fire Extinguisher Training.
- Secure authorization for the hot work operation from the designated management representative in the form of a Hot Work Permit (see Appendix A and B) when required.
- Inspect welding and cutting equipment and operate equipment as instructed by training and manufacturer's operating manual.
- Ensure the safe usage of cutting and welding equipment.
- Properly use PPE
- Ensure required fire watch is being conducted.
- Complete the "Required Precautions Checklist" located on the Hot Work Permit before beginning work.

General Requirements

- Complete a *Hot Work Permit* prior to beginning work, when required (see Appendix A and B).
- Employees who operate hot work equipment must be properly instructed and qualified to operate hot work equipment.
- Employees exposed to hazards created by hot work operations shall be protected by PPE.
- Manufacturer's instructions regarding the operation of equipment must be followed at all times.
- Inspect equipment for damage or defects. Damaged or malfunctioning equipment must be taken out of service until repaired and marked with the words "**Out of Service, Do Not Use**."
- No welding or cutting shall be performed on used drums, barrels, tanks, or other containers until they have been thoroughly cleaned or purged to remove all flammable liquids and gasses.
- Hot work is not permitted in; explosive atmospheres, flammable or combustible materials storage areas, unventilated areas, and public areas without additional protective equipment such as screens or barriers.
- Where the hot work area is accessible to persons other than the operator of the hot work equipment, a sign displaying '**Caution. Hot Work In Progress. Stay Clear**' shall be conspicuously posted.

Personal Protective Equipment (PPE)

Appropriate PPE must be used whenever hot work is conducted. At a minimum eye, face, and hand protection is required. Attendants on fire watch must also be provided with appropriate PPE. Other PPE as required (i.e., boots, gloves, hard hat, fall protection, and protective garments) must be used when needed. Indoor hot work involving zinc-bearing base materials or filler metals coated with zinc-bearing materials and lead-base metals or materials (e.g., paint) must be done within local exhaust hoods, booths, or fixed enclosures. FM-OHS must be notified in order to conduct air or noise sampling.

- Screens must be used and arranged in a manner that provides protection for surrounding persons. Screens may not obstruct or prevent ventilation or egress.
- Local exhaust or general ventilation must be provided and sufficient to keep fumes, gases, and dusts below the permissible exposure limits and below 10% of the lower explosive limit for flammable materials.
- Welding cables and other equipment must not obstruct egress and be kept clear of passageways, ladders, and stairways.
- All operators and attendants of resistance welding or brazing equipment must use transparent face shields or goggles.

Fire Prevention and Protection

Area Preparation:

- An approved fire extinguisher of sufficient size and appropriate type must be available within 30 feet of the hot work. The fire extinguisher must have a minimum rating of 2-A:20-B:C.
- Oxy-acetylene carts should be stored and transported along with an approved fire extinguisher.
- All movable fire hazards surrounding the hot work area must be removed. Fire hazards can include but are not limited to any material, state, process, or instance of combustion in which fuel is ignited and combined with oxygen, giving off light, heat, and flame.
- If neither the fire hazard nor the object to be welded can be moved, guards must be used to confine heat, sparks, and slag.
- Floor and wall openings or cracks must be covered or guarded so that combustible materials below the hot work area will not be exposed to sparks and hot slag.
- Ducts and conveyor systems that might carry sparks must be suitably protected or shut down.
- Combustible floors must be kept wet, covered with damp sand, or protected by fire-resistant shields. If a wet floor technique is used, employees operating arc welding equipment must be protected from possible shock.
- If welding is performed on noncombustible walls, precautions must be taken to prevent ignition of combustibles on the other side of the wall. Welding must not be attempted on walls or partitions of combustible sandwich-type panel construction.

Fire Watch:

A "fire watch" is always required and is one or more persons dedicated *solely* to the look out and control of stray fires that may be caused by hot work activities.

- The fire watch shall include having fire extinguishing equipment readily available and shall be trained in the use of such equipment.
- A fire watch must be maintained for at least one half hour after hot work has been completed to detect and extinguish possible smoldering fires.
- Personnel conducting the fire watch are responsible for extinguishing spot fires and communicating an alarm.

Appendix A: HOT WORK PERMIT PROCEDURE

If not properly controlled, hot work operations present a fire hazard that may lead to significant property damage, injury, loss of life, unnecessary disruption of normal building functions and emergency response by unintentionally activating the automatic fire detection system.

University of Virginia employees and contract personnel engaged in hot work must be authorized to do so by their Facilities Management Supervisor or approved Project Manager.

To Complete a Hot Work Permit

1. *Hot Work Permits* may be obtained from your Supervisor, from the FM-OHS Office, or in Appendix B of this Guide.
2. *Hot Work Permits* for scheduled work must be completed 24-hours before a project.
3. The *Hot Work Permit* must be complete before it will be authorized.

To Submit a Hot Work Permit

1. Submit completed hot work permits to your supervisor for authorization.
2. Facilities Management Customer Service Center will distribute copies to HVAC and Fire Alarm Technicians, if required.
3. Permit holders should be prepared for on-site inspection at all times.

Emergency and After-hours Hot Work

1. Follow all hot work and *Hot Work Permit* procedures.
2. Fill out and deliver a copy of *Hot Work Permit* to your Supervisor.
3. Supervisors authorizing emergency and after-hours hot work must inspect the work area prior to allowing emergency and after-hours hot work operations.
4. ~~At job completion, submit all *Hot Work Permits* to FM-OHS for recordkeeping.~~

Long-term Hot Work

1. Follow all hot work and *Hot Work Permit* procedures listed in this Guide.
2. Send initial *Hot Work Permit* to FM-OHS.
3. Fill out and maintain permits on a daily basis for long-term hot work operations.
4. Supervisors MUST inspect work area DAILY prior to initiating hot work each day.
5. Permit holders should be prepared for an on-site safety inspection at all times.
6. At job completion, retain all *Hot Work Permits* for one year.