



## Hot Work Program

San José State University

One Washington Square

San José, California

Facilities Development and Operations Department

Environmental Health and Safety

May 26, 2016

**1) Purpose and Scope**

The purpose of this policy is to establish the necessary precautions and procedures required to conduct hot work in areas other than a designated hot work area. This policy applies to all San Jose State University (SJSU) Facilities Development and Operations (FD&O) employees who perform hot work in any area other than an approved designated area such as a maintenance or fabrication shop.

**2) Standards, Regulations and References**

- a. California Code of Regulations,
  - i. Title 8 CCR Sections 1536, 4799, 4812-16, 4838, 4845-48, and 5150 concurs with OSHA 29 CFR 1910.252
- b. California Code of Regulations,
  - i. Title 8, Section 3202. The Injury and Illness Prevention Program.

**3) Roles and Responsibilities**

- a. The University
  - i. The University is committed to and has a duty to provide a safe and healthful work environment for all employees from the occupational exposure to the hazards of Hot Work.
- b. Environmental Health and Safety
 

Environmental Health and Safety will ...

  - i. Establish, implement and maintain the Hot Work Program which is designed to eliminate or minimize employee exposure to the hazards of Hot Work.
  - ii. Develop and implement campus-wide training requirements and materials. Employee information and training are provided at the time of initial assignment and annually thereafter.
  - iii. Maintain a record of training given to employees for 3 years.
  - iv. Audit and review the Hot Work Program annually.
- c. Department Management
 

Each affected Department will ...

  - i. Collaborate with Environmental Health and Safety to identify Hot Work processes
  - ii. Provide the time and resources to effectively implement the Hot Work Program when employees perform such work.
  - iii. Enable employees who perform Hot Work to receive hazard awareness training.
  - iv. Develop and enforce work practices and methods designed to control or eliminate the risk of exposure to the hazards of Hot Work.
  - v. Provide the necessary work implements, such as tools, gloves, personal protective equipment and barrier devices.
- d. Employees
 

Every employee who is at risk of exposure to the hazards of Hot Work will ...

  - i. Receive hazard awareness training on an annual basis.

- ii. Be provided with the necessary work implements, such as tools, gloves, personal protective equipment and barrier devices for employees to perform their job safely.
- iii. Follow the prescribed work practices and methods designed to control or eliminate the risk of exposure to the hazards of Hot Work.
- iv. Report incidents to the supervisor immediately.

**4) Definitions**

- a. Designated Safe Hot Work Area: areas that have been designed and constructed for performing open-flame or spark-producing work. Designated Safe Hot Work Areas on campus include:
  - i. Central Plant
  - ii. Trades Shops
  - iii. Maintenance Shops
  - iv. Building Mechanical Rooms
  - v. Auto Shop
- b. Fire Watch: A person assigned to watch for fire during Hot Work. It is conceivable that certain operations may not require the constant monitoring of an operation after its completion. Each operation will require a full and thorough evaluation of the need for a fire watch. It is the responsibility of the requesting supervisor to justify why a watch is not needed. A fire watch shall not be actively engaged in any other operation or work activity during permit activity. A fire watch must continue for 30 minutes after work is completed.
- c. Hot Work: Any operation that produces a flame, heat or sparks such as, but not limited to: electric or gas welding, abrasive cutting, soldering, grinding, cutting or burning with acetylene torch, and brazing activities. For the purposes of this policy, Hot Work is work conducted outside of Designated Safe Hot Work Area.
- d. Maintenance Shop: A room or enclosed area that is designed for ongoing repair, fabrication, and maintenance type activities.

**5) Program Audit**

Environmental Health and Safety will perform a program audit annually and make improvements to the Hot Work Program as conditions change.

**6) Document History and Control**

The San José State University Hot Work Program described herein supersedes all prior program documents.

<i>Rev #</i>	<i>Document Revision History</i>	<i>Author</i>	<i>Reviewer</i>	<i>Date</i>
00	Creation	Matt Nymeyer EHS Specialist		5/26/2016



## The Hot Work Program

### General Practices and Procedures

- 1) Where practical all flammable and/or combustible materials (liquid, solids or gases) will be relocated to at least 35 feet from the work site.
- 2) Where relocation is impractical, combustibles must be protected with flameproof covers, shielded with metal, guards, curtains or wet down to help prevent ignition of material.
- 3) Ducts, conveyor systems, and augers that might carry sparks to distant combustibles must be protected or shut down.
- 4) Where cutting welding is done near walls, partitions, ceilings, a roof of combustible construction, fire-resistant shield or guards will be provided to prevent ignition
- 5) If welding is to be done on a metal wall, partitions, ceiling, or roof, precautions must be taken to prevent ignition of combustibles on the other side, due to conduction or radiation of heat.
- 6) Where combustibles cannot be relocated on the opposite side of work, a fire watch person will be provided on the opposite side the work.
- 7) Welding will not be attempted on a metal partition, wall, ceiling, or roof having a covering or on walls having combustible sandwich panel construction.
- 8) Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceiling, or roofs will not be undertaken if the work is close enough to cause ignition by combustion.
- 9) In areas where there is dust accumulation of greater than 1/16 inch within 35 feet of the area where welding/hot works will be conducted, all dust accumulation will be cleaned up following the housekeeping program of the facility before welding/hot works are permitted.
- 10) Suitable fire extinguishers must be provided and maintained ready for instant use.
- 11) A fire watch person will be provided during and for 30 minutes past the completion of the welding project.
- 12) A cutting/welding permit will be issued on all welding or cutting outside of designated welding areas.
- 13) At least one 10lb dry chemical fire extinguisher should be within access of the 35 feet of work area.
- 14) Protective dividers such as welding curtains or non-combustible walls will be provided (if needed) to contain sparks and slag to the combustible free area.

### Prohibited Activities

Hot Work is not allowed:

- 1) In areas not authorized by management
- 2) In the presence of potentially explosive atmospheres.
- 3) In areas near the storage of large quantities of exposed, readily ignitable materials.

**Hot Work Permit**

To ensure that the general practices and procedures for safely performing Hot Work are met, a Hot Work Permit must be completed and approved prior to the commencement of any Hot Work activity. The permit is included at the end of this policy and is also available as a fillable pdf form.

Steps to complete the Hot Work Permit:

Step 1:	A competent person familiar with the work area and the nature of the work to be completed should fill out the Hot Work Permit. The work area should be prepped according to the permit conditions.
Step 2:	The Hot Work Permit must be approved by the department supervisor or work lead certifying they have inspected the immediate and surrounding work area for fire hazards and that sufficient precautions are being taken to reduce the risk of fire.
Step 3:	Post the approved Hot Work Permit in the work area.

- 1) Hot work permits are task specific and valid for a specified period of time. Permits expire at: (1) job completion; (2) change of location; and (3) end of work shift.
  - a. Hot work activities that extend beyond the end of the work shift require the oncoming supervisor issue another permit before the work continues.
  - b. Large scale construction or other long term hot work may be covered by a blanket Hot Work permit. The same precautions must be reviewed prior to each hot work project by the supervisor / project manager and logged on the Blanket Hot Work Permits log attached to original permit.
- 2) The authorized manager granting approval may add additional conditions as are applicable to the work and these conditions shall be considered requirements that must be met in order to conduct the work.
  - a. Appropriate barriers and curtains shall be used outside the maintenance shop to prevent welding flashes.
  - b. Portable ventilation shall be used when appropriate ventilation can't be supplied during welding operations.
- 3) It is the responsibility of the requesting supervisor to post the Hot Work permit in the area so that it is clearly visible and that the permit is retrieved at the end of the operation.
- 4) Upon completion of the job or at the end of the work shift, the requesting supervisor shall ensure the permit is returned to EH&S to be kept on file for a minimum of 2 years.
- 5) Blanket Hot Work Permits:
  - a. The permit should indicate that it's a blanket permit
  - b. For all approved blanket permits, the precautions specified on the permit and used during the initial permit issue must be reviewed and implemented prior to each hot work task covered by the blanket permit.

- c. The supervisor or project lead must ensure that the conditions of the permit are met before hot work is performed. The supervisor should initial the permit on the lines provided to indicate they have done so.
- d. Blanket permits do not cover multiple buildings or multiple floors in the same building.
- e. Blanket permits can be issued for a maximum fourteen (14) consecutive calendar days

**Additional Safety Considerations**

Electric Welding

(Title 8 CCR - Article 90. Electric Welding, Cutting and Heating (Sections 4850 - 4853))

- 1) Perform Safety Check on all equipment
- 2) Ensure fire extinguisher is charged and available
- 3) Ensure electrical cord, electrode holder and cables are free from defects (no cable splices are allowed within 10 feet of the electrode holder)
- 4) Ensure PPE (welding hood, gloves, rubber boots/soled shoes, and aprons) are available and have no defects.
- 5) Ensure the welding unit is properly grounded
- 6) All defective equipment must be repaired or replaced before use
- 7) Remove flammables and combustibles
- 8) No welding is permitted on or near containers of flammable material, combustible material or unprotected flammable structures
- 9) Place welding screen or suitable barricade around work area to provide a fire safety zone and prevent injuries to passersby (do not block emergency exits or restrict ventilation).
- 10) Ensure adequate ventilation and lighting
- 11) Execute Hot Work Permit procedures
- 12) Set Voltage Regulator no higher than the following for
  - a. Manual Alternating Current Welders- 80 volts
  - b. Automatic Alternating Current Welders – 100 volts
  - c. Manual or automatic Direct Current Welders – 100 volts
- 13) Uncoil and spread out welding cable
- 14) To avoid overheating, ensure proper contact of work leads and connections, remove any metal fragments from magnetic work clamps (to avoid electric shock do not warp welding cables around a body part and avoid welding in wet conditions)
- 15) Fire watch for one hour after welding and until all welds have cooled
- 16) Perform final watch and terminate permit.

Gas Welding

1910.253 - Oxygen-fuel gas welding and cutting

- 1) Perform Safety Check on all equipment
- 2) Ensure tanks have gas and fitting are tight
- 3) Ensure fire extinguishers is charged and available

- 4) Inspect hoses for defects
- 5) Ensure PPE (welding hood, gloves, rubber boots/soled shoes and aprons) are available and have no defects
- 6) All defective equipment must be repaired or replaced before use!
- 7) Remove flammables and combustibles
- 8) No welding is permitted on or near containers of flammable material, combustible material or unprotected flammable structures
- 9) Place welding screen or suitable barricade around work area to provide a fire safety zone and prevent injuries to passersby (do not block emergency exits or restrict ventilation).
- 10) Use an authorized Air Filtering Respirator, if required
- 11) Ensure adequate ventilation and lighting
- 12) Execute Hot Work Permit Procedures
- 13) Open valves on oxygen and gas tanks to desired flow
- 14) Shut tank valves and relieve hose pressure. Store Hoses.
- 15) Fire watch for 30 minutes after welding and until all welds have cooled.
- 16) Perform final fire watch and terminate permit

Compressed Gas

Care, Transporting, Moving and Storage

Article 32 - §1740. Storage and Use of Cylinders / §1743. General Precautions.

- 1) Valve caps on cylinders must be in place and secured. Valve caps must not be used for lifting. Do not pry cylinder caps while frozen. Loosen caps with warm water.
- 2) Cylinders must be transported on a secured cradle only, and by tilting or rolling them.
- 3) Cylinders must be moved by tilting and rolling them on their bottom edges. Avoid dropping cylinders or striking other cylinders.
- 4) Cylinders transported by powered vehicles must be secured in a vertical position
- 5) Regulators must be removed and caps put in place prior to moving cylinders, unless cylinders are secured on a special carrier
- 6) Proper steadying devices must be used to keep cylinders from falling over while in use
- 7) Cylinder valves must be closed when cylinders are empty or when cylinders are moved
- 8) Oxygen cylinders must be stored separated from fuel gas cylinders or combustible materials a minimum distance of 20 feet or by a five foot high noncombustible barrier with a fire-resistance rating of one-half hour.
- 9) Cylinders stored inside building must be stored 20 feet from combustible materials where they were well protected, well ventilated, and dry. Cylinders must not be stored near elevators, stairs or gangways. Assigned storage locations must prevent cylinders from being knocked over or damaged.
- 10) Cylinders must be kept away from welding or cutting operations to prevent sparks, hot slag, or flame from reaching them. Fire resistant shields must be used when this impractical.
- 11) Cylinders must be placed away from electrical circuits. Do not strike electrodes against a cylinder to strike an arc.



- 12) Cylinders containing oxygen, acetylene or other fuel gas must not be used in confined spaces.
- 13) Cylinders must not be used as rollers or supports
- 14) Only the gas supplier is authorized to mix gases in a cylinder. Only the Supervisor is authorized to have cylinders refilled.
- 15) No damaged or defective cylinder may be used.

#### Use of Fuel Gas

##### 1910.253 - Oxygen-fuel gas welding and cutting.

- 1) SJSU employees will be instructed in the safe use of fuel gas.
- 2) Valves must be opened slightly and closed immediately before a regulator is connected to the cylinder. This is called “cracking” which clears the valve of dust and dirt.
- 3) The employee must stand to the side of the outlet, not in front. Valves must be cracked away from welding work, sparks, flames or other sources of ignition.
- 4) Valves must be opened slowly to prevent damage to the regulator. Valves must not be opened more than 1 ½ turns. If wrench is required it must stay in position in case of emergency for a quick shut off. Manifold or coupled cylinders must have a wrench available for immediate use. Do not place objects on top of cylinders, or damage may occur to the safety device or interfere with the quick closing of the valve.
- 5) Cylinders must be closed and the gas released from the regulator before removing the regulator.
- 6) If cylinders, valves, regulators, plug, or other safety devices are damaged, they must be tagged out of service and removed from the work area.

#### Manifolds

- 1) Fuel gas and oxygen manifolds must bear the name of the substance they contain.
- 2) Fuel gas and oxygen manifolds must be placed in safe, well ventilated and accessible locations.
- 3) Hose connections must be made so that they cannot be interchanged between fuel gas and oxygen manifolds and supply header connections. Keep hose connections free of grease and oil, and do not use adapters to interchange hoses
- 4) Manifold and header hose connections must be capped when not in use.
- 5) Nothing may be placed on manifolds that will damage the manifold or interfere with the quick closing of the valves

#### Hoses

- 1) Fuel gas hose and oxygen hose must be distinguishable from each other, and not be interchangeable. Contrast may be made by different colors or by surface characteristics distinguishable by the sense of touch
- 2) Employees will inspect all hoses in use at the beginning of each work shift. Defective hoses will be tagged and removed from service

- 3) Hoses subjected to flashback, or which show severe wear or damage must be tested at twice that normal pressure from the hose, but not less than 300 p.s.i. if defective, hose must not be used.
- 4) Hose couplings must be disconnected by rotary motion only.
- 5) Hoses stored in boxes must be well ventilated.
- 6) Hoses, cables, and other equipment must be kept clear of passageways, ladders and stairs

#### Torches

- 1) Torches must be inspected at the beginning of each working shift for leaving shutoff valves, hose coupling, and tip connections. Defective torches may not be used.
- 2) Clogged torch tip openings must be cleaned
- 3) Torches may be lit by friction lighters or other approved devices only

#### Regulators and Gauges

- 1) Pressure and regulators and related gauges, must work properly while in use

#### Oil and Grease Hazards

- 1) Oxygen cylinders and fittings must be kept away from oil or grease. Cylinders and fittings must be kept free from oil or greasy substances and may not be handled with oily hands or gloves
- 2) Oxygen must not be directed at oily surfaces, greasy clothes, or within a fuel oil or other storage tank or vessel.

#### Fire Protection

- 1) Objects to be welded, cut or heated must be moved to a designated safe location. If the object cannot be easily moved all moveable fire hazards will be moved protected.
- 2) If the object to be welded, cut or heated cannot be moved and if all the fire sparks, and slag, and to protect the immovable fire hazards from them
- 3) Welding, cutting, or heating must not be performed in the presence of flammable paints, flammable compounds or heavy dust concentrations.
- 4) Fire extinguishers must be immediately available in the work area, free of obstruction, and maintained for instant use.
- 5) When normal fire prevention precautions are not sufficient for the welding, cutting, or heating operation supervisor will assign a fire watch. Sufficient amount of time must be allowed after completion of work to ensure that the possibility of fire does not exist. The designated fire watch, must be trained in firefighting equipment.
- 6) Gas supplies must be shut off during lunch breaks, overnight, or during shift breaks. Hoses and torches must be removed from confined spaces.



**Hot Work Permit**

**BEFORE INITIATING HOT WORK, ENSURE PRECAUTIONS ARE IN PLACE!  
MAKE SURE APPROPRIATE FIRE EXTINGUISHERS ARE READILY AVAILABLE!**

<b>INSTRUCTIONS:</b> 1. Complete info on left side. 2. Verify precautions on right side (or do not proceed)		<b>Required Precautions Checklist:</b>		
<b>DATE:</b>		<b>CHECKLIST ITEMS</b>	<b>YES</b>	<b>NA</b>
<b>LOCATION/BUILDING FLOOR:</b>		<b>GENERAL</b>		
<b>DESCRIPTION OF WORK:</b>		<ol style="list-style-type: none"> <li>Available sprinklers, hose streams and extinguishers are in service / operable.</li> <li>Hot work equipment is in good repair.</li> <li>Gas cylinders secured.</li> <li>Warning signs posted.</li> </ol>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>PERSON PERFORMING HOT WORK:</b>		<b>REQUIREMENTS WITHIN 35 FEET OF WORK</b>		
<p>I verify the above location has been examined and the precautions checked on the Required Precautions Checklist have been or will be taken prior to start of hot work.</p> <p>Signature _____ : _____ (Employee requesting permit)</p> <p>Print Name: _____</p> <p>I have reviewed this permit and the information noted and approve the work to be completed as outlined above.</p> <p>Signature _____ : _____ (Supervisor/Manager)</p> <p>Print Name: _____</p>		<ol style="list-style-type: none"> <li>Flammable liquids, dust, lint and oil deposits removed.</li> <li>Explosive atmosphere in area eliminated.</li> <li>Floors swept clean.</li> <li>Combustible floors wet down.</li> <li>Combustibles removed or protected with fire resistant cover.</li> <li>All wall and floor openings (within 35 feet) covered.</li> </ol>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		<b>REQUIREMENTS FOR ELEVATED WORK</b>		
		<ol style="list-style-type: none"> <li>Fire resistant tarpaulins suspended between work and combustibles.</li> <li>Fall protection required above 4 feet.</li> <li>Safety/Plant Managers need to approve prior to any hot work done on roofs.</li> </ol>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		<b>WORK ON WALLS OR CEILING</b>		
		<ol style="list-style-type: none"> <li>Construction is non-combustible and without combustible insulation.</li> <li>Combustibles moved away from opposite side.</li> <li>No danger of conduction of heat into another area exists.</li> </ol>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		<b>WORK ON ENCLOSED EQUIPMENT</b>		
		<ol style="list-style-type: none"> <li>Enclosed equipment cleaned of all combustibles.</li> <li>Containers purged of all flammable liquids/vapors (verified by gas detection equipment).</li> <li>Pipelines disconnected/blanked.</li> <li>Space ventilated</li> <li>Confined Space Entry Permit required.</li> </ol>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		<b>FIRE WATCH/HOT WORK AREA MONITORING</b>		
		<ol style="list-style-type: none"> <li>Fire watch will be provided during and 30 minutes after work including breaks.</li> <li>Fire watch is supplied with suitable extinguishers or hose.</li> <li>Fire watch is trained in use of fire extinguishers.</li> <li>Fire watch is trained in site Emergency Procedures including sounding alarms</li> <li>Fire watch is required for adjoining areas above and below</li> </ol>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>PERMIT PERIOD</b>	<input type="checkbox"/> One Time Permit <input type="checkbox"/> Blanket Permit (not to exceed 14 consecutive days)	<b>BEGINS:</b>	<b>TIME:</b>	<b>AM</b> <input type="checkbox"/>
				<b>PM</b> <input type="checkbox"/>
<b>EXPIRES:</b>		<b>TIME:</b>	<b>AM</b> <input type="checkbox"/>	<b>PM</b> <input type="checkbox"/>

