

	<b>HOT WORK - WELDING, CUTTING &amp; BRAZING</b>	Doc No:	5101 - 5019
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<i>SAFETY OPERATING PROCEDURE (SOP)</i>		Page 1 of 12	
OPR:	Approval:	DEPARTMENT: RISK MANAGEMENT	
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## 1.0 PURPOSE

- 1.1 To establish standards for welding, cutting and brazing operations for Okaloosa County employees. This procedure applies to all employees and contractors working on work sites under the authority of Okaloosa County. This procedure shall regulate not only welding, cutting, and brazing but all other forms of spark or heat producing operations occurring in work areas where the potential for ignition or combustion of materials is possible.

## 2.0 DEFINITIONS

- **Combustible:** having a flash point at or above 100 Degrees Fahrenheit (100° F). Examples of combustibles are wood, paper, rubber, plastic, etc.
- **Conduction:** process by which heat or electricity is directly transmitted through a substance when there is a difference of temperature of or electrical potential between adjoining materials.
- **Designated Area:** specific location designed and approved for hot work operations that is maintained fire safe such as a shop or a detached outside location, that is of non-combustible or fire-resistant construction, essentially free of combustible and flammable contents, and suitably segregated from adjacent areas.
- **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:** 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.
- **Flammable:** having a closed cup flash point below 100 Degrees Fahrenheit (100° F). Examples of flammables are gasoline, acetone, toluene, alcohols, etc.
- **Hot Work:** work involving burning, welding, or a similar operation that is capable of initiating fires or explosions.
- **Hot Work Operator:** individual performing the hot work.
- **Permit:** a document authorizing the performance of hot work.
- **Permit Authorizing Individual (PAI):** individual designated by management to authorize hot work.

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- **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 Blanket:** heat-resistant fabric listed, approved and designed to be in the vicinity of a hot work operation; intended for use in horizontal applications with light to moderate exposures such as that resulting from chipping, grinding, heat-treating, sand blasting and light horizontal welding; designed to protect machinery and prevent ignition of combustibles such as wood that are located adjacent to the underside of the blanket.
- **Welding Curtain:** heat-resistant fabric listed, approved and designed to be in the vicinity of a hot work operation; intended for use in vertical applications with light to moderate exposures such as that resulting from chipping, grinding, heat-treating, sand blasting and light horizontal welding; designed to prevent sparks from escaping an area.

### 3.0 RESPONSIBILITIES

#### 3.1 Management

- 3.1.1 Shall be responsible for the safe operations of hot work activity.
- 3.1.2 Shall establish permissible areas for hot work. Hot work shall only be permitted in areas that are or have been made fire safe.
- 3.1.3 Designate a Permit Authorizing Individual (PAI).
- 3.1.4 Ensure only approved tools and equipment are used.
- 3.1.5 Ensure that all employees and contractors performing hot work are familiar with the requirements of this standard.
- 3.1.6 Advise all contractors about site-specific flammable materials, hazardous processes or conditions, or other potential fire hazards.

#### 3.2 Permit Authorizing Individual (PAI)

- 3.2.1 Responsible for the safe operations of hot work activities.
- 3.2.2 Ensure the hot work operator and fire watch have the proper PPE to minimize the potential for ignition, burning, trapping hot sparks, and electric shock.

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- 3.2.3 Shall inspect for flammable materials, hazardous processes, or other potential fire hazards that are present or likely to be present at the work location.
- 3.2.4 Ensure the protection of combustibles from ignition by the following means:
  - 3.2.4.1 Consider alternative methods to hot work.
  - 3.2.4.2 Move the work to a location free from combustibles.
  - 3.2.4.3 If work cannot be moved, move the combustibles to a safe distance (35ft min.) or protect the combustibles from ignition sources using fire blankets or curtains.
  - 3.2.4.4 Schedule work so that operations that could expose combustibles to ignition sources do not begin during hot work operations.
- 3.2.5 If provisions 3.2.4.2 and 3.2.4.4 cannot be met then hot work shall not be performed.
- 3.2.6 Ensure that appropriate fire protection and extinguishing equipment are located at the hot work site.
- 3.2.7 Ensure that a fire watch is at the site when required.
- 3.2.8 In instances where a fire watch isn't required, the PAI shall inspect the work site a half hour after completion of hot work operations to inspect and extinguish any smoldering fires.

### 3.3 Hot Work Operator

- 3.3.1 Shall have the PAI's approval before starting any hot work operations.
- 3.3.2 Shall inspect all equipment and tools before starting hot work to ensure their serviceable and in safe-operating condition.
- 3.3.3 Shall have the proper PPE to minimize the potential for ignition, burning, trapping hot sparks, and electric shock.
- 3.3.4 Shall have the full authority to stop hot work operations if unsafe conditions develop and shall immediately notify the supervisor or the PAI to reassess the situation.

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3.3.5 Ensure there are no flammable or combustible materials within 35ft of hot work operations.

3.3.6 Shall have fire-extinguishing equipment readily available and shall be trained in its use.

#### 3.4 Fire Watch

3.4.1 Shall have the proper PPE to minimize the potential for ignition, burning, trapping hot sparks, and electric shock.

3.4.2 A fire watch shall be required by the PAI when hot work is performed in a location where other than a minor fire might develop or where any of the following conditions exist:

3.4.2.1 Combustible materials in building construction or contents closer than 35ft to the hot work operation.

3.4.2.2 Combustible materials more than 35ft away from the hot work operation but easily ignited by sparks.

3.4.2.3 Wall or floor openings within a 35ft radius that expose combustible materials in adjacent areas, including concealed spaces in walls and floors.

3.4.2.4 Combustible materials adjacent to the opposite side of partitions, walls, ceilings, or roofs and likely to be ignited.

3.4.3 Fire watch shall be maintained for 1 hour after completion of hot work operations in order to detect and extinguish smoldering fires.

3.4.3.1 The duration of the fire watch shall be permitted to be extended if the PAI determines the fire hazards warrant the extension.

3.4.4 A fire watch shall be trained and competent to recognize the inherent hazards of the work site and hot work operations.

3.4.5 A fire watch shall ensure safe conditions are maintained during hot work operations.

3.4.6 A fire watch shall have the full authority to stop hot work operations if unsafe conditions develop.

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- 3.4.7 A fire watch shall have fire-extinguishing equipment readily available and shall be trained in its use.
- 3.4.8 A fire watch shall be familiar with the facilities and procedure for sounding an alarm in the event of a fire.
- 3.4.9 A fire watch shall watch for fires in all exposed areas and try to extinguish them only when the fires are obviously within the capacity of the equipment available. If the fire watch determines that the fire is not within the capacity of the equipment, the fire watch shall sound the alarm immediately.
- 3.4.10 Fire watch may perform other small additional tasks, but those tasks shall not distract from fire watch responsibilities.
- 3.4.11 Following the completion of the fire watch time period, fire monitoring shall be provided within the hot work area for up to an additional 3 hours as determined by the PAI.

### 3.5 Contractors

- 3.5.1 Before starting any hot work, shall discuss the planned project completely, including the type of hot work to be conducted and the hazards in the area. Additionally, they shall comply with requirements in relation to performing hot work in accordance with this procedure.
- 3.5.2 Supervisors shall ensure that all contractors are given a safety briefing informing them of any hot work hazard or conditions.

## 4.0 DESIGNATED AREAS

- 4.1 Designated Areas shall meet the same requirements of Permit-Required Areas.
- 4.2 Prior to the start of hot work in a designated area, the hot work operator shall verify:
  - 4.2.1 Location is fire resistant.
  - 4.2.2 Are no flammable or combustible materials within 35ft of the hot work area in all directions.
  - 4.2.3 Fire extinguishers are readily available and in good working condition.

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4.2.4 Ventilation is working properly.

4.2.5 Equipment and tools are in good working order.

4.3 Designated areas shall be inspected annually to ensure compliance with this procedure.

4.4 Signs shall be posted designating hot work areas as deemed by the PAI.

## **5.0 PERMIT-REQUIRED AREA**

5.1 Before hot work operations can begin, a permit must be issued by the PAI.

## **6.0 HOT WORK PERMIT**

6.1 Before a hot work permit is issued, the following conditions shall be met:

6.1.1 Hot work equipment shall be inspected to ensure it is in good working condition and fully operational.

6.1.2 Combustible materials laying on the floor, shall be swept clean to a radius of 35ft.

6.1.3 Combustible floors shall be kept wet, covered with damp sand, or protected by welding blankets or equivalent.

6.1.3.1 Where floors have been wet down, personnel operating arc welding equipment shall be protected from possible electric shock.

6.1.4 Combustibles shall be relocated at least 35ft in all directions.

6.1.4.1 If moving isn't practical, combustible materials shall be shielded by a barrier constructed on non-combustible materials or otherwise protected by a welding curtain, welding blanket or equivalent.

6.1.4.2 To prevent the entrance of sparks, the edge of welding blankets placed on the floor shall be tight or overlap.

6.1.5 Openings or cracks in walls, floors or ducts within 35ft of the hot work site shall covered or sealed with fire-rated or non-combustible material to prevent the passage of sparks to adjacent areas.

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- 6.1.6 Ducts and conveyor systems that might carry sparks to distant combustibles shall be shielded, shutdown, or both.
- 6.1.7 If hot work is done near walls, partitions, ceilings or roofs of combustible construction, they shall be protected by a welding curtain, welding blanket or equivalent.
- 6.1.8 If hot work is done on one side of a wall, partition, ceiling or roof:
  - 6.1.8.1 Precautions shall be taken to prevent ignition of combustibles on the other side by relocating the combustibles.
  - 6.1.8.2 If it is impractical to relocate combustibles, a fire watch shall be provided on the side opposite from where the work is being performed.
- 6.1.9 Hot work shall not be attempted on a partition, wall, ceiling, or roof that has a combustible covering or insulation, or on walls or partitions of combustible sandwich-type panel construction.
- 6.1.10 Hot work that is performed on pipes or other metal that is in contact with combustible walls, partitions, ceilings, roofs, or other combustibles shall not be undertaken if the work is close enough to cause ignition by conduction.
- 6.1.11 Fully charged and operable fire extinguishers that are appropriate for the type of possible fire shall be available immediately at the work area.
- 6.1.12 During hot work, all precautions shall be taken to avoid accidental activation of automatic fire protection systems.
- 6.1.13 The hot work operator as well as any nearby personnel shall wear appropriate PPE as to protect them against hazards such as heat, sparks, and slag.
- 6.1.14 In instances where the scope of work and the tools used to conduct hot work result in the possibility of slag, sparks, spatter, or similar mobile ignition sources traveling farther than 35ft, the PAI shall be permitted to extend the safe distance and areas beyond 35ft.
- 6.1.15 In instances where the scope of work and the tools used to conduct hot work result in the possibility of slag, sparks, spatter, or similar mobile ignition sources are not capable of leaving the immediate area



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of the applied hot work, the PAI shall be permitted to reduce the safe distance and areas to less than 35ft.

## 7.0 CONFINED SPACE ENTRY

7.1 Performing hot work in a Confined Space shall be in accordance with SOP 5101-5025 *Confined Space Entry*.

## 8.0 NON-PERMISSIBLE AREAS

8.1 Hot work will not be permitted in the following situations:

8.1.1 In areas not authorized by the Director/Manager.

8.1.2 In sprinkler equipped buildings when such protection isn't fully functional.

8.1.3 In the presence of potential explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dust with air).

8.1.4 In any confined space without prior coordination with the Safety office/Risk Management.

## 9.0 FALL PROTECTION

9.1 If performing hot work from an elevated surface of 4 ft or more, employees shall comply with procedures outlines in SOP 5101- 5021 *Fall Protection*.

## 10.0 PPE

10.1 PPE shall be worn to minimize the potential for ignition, burning, trapping hot sparks, and electric shock.

10.2 In addition to a welding mask, head protection such as a welding hood or cap to protect the head from sparks or slag.

10.3 Safety glasses shall be worn under the welding mask to protect the employee's eyes in the event the welding helmet is impacted and penetrated.

10.4 Long-sleeve welding apron and gloves shall be worn to protect the torso, arms and hands.

10.5 Welding chaps and safety shoes shall be worn to protect the legs and feet.

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10.6 Any employee assisting in hot work operations is required to wear the same level of PPE as the employee actually performing the hot work.

## 11.0 SAFETY

11.1 All fittings, hose connections, regulators, valves, and safety devices must be inspected for leaks and proper working condition. Soapy water or equivalent can be used for detecting leaks.

11.2 Hose, valves, regulators and other apparatus must be kept clean. In no case should oil or grease be permitted to come in contact with any portion of the oxygen equipment.

11.3 When parallel lengths of oxygen and fuel hose are taped together for convenience, and to prevent tangling, not more than 4 inches out of 12 will be covered by tape.

11.4 Hoses showing leaks, burns, worn places, or other defects shall be repaired or replaced before being used.

11.5 Pressure from cylinders shall be reduced through regulators designed and marked for the product being used.

11.6 Matches or hot metal will not be used to light a torch. A friction lighter or pilot is the only safe method.

11.7 All torches shall have a flash back arrestor installed to prevent flash back into the torch and/or cylinders.

11.8 Only approved non-spark producing tools (brass) shall be used on hot work equipment. Valves shall not be hammered or forced open.

11.9 All cylinders will be securely fastened to a cart, or other carrier, in an upright position during and after use.

11.10 When hot work operations are complete or at the end of the work day/shift, all pressure shall be bled off the regulator and manifold.

11.11 Terminals for welding leads should be protected from accidental electrical contact by personnel or by metal objects i.e., vehicles, crane hooks, etc.

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## 12.0 TRAINING

12.1 Individuals performing hot work or fire watch duties shall be trained and competent in the safe operations of the equipment and proper protective equipment for the task.

## 13.0 RECORD KEEPING

13.1 Training records shall be maintained at the department in which the employee is working and a copy of the training certificate will be sent to Human Resources for their permanent file.

## 14.0 ABBREVIATIONS

ABBREVIATION	DESCRIPTION
F	Fahrenheit
ft	Feet
min	Minimum
PAI	Permit Authorizing Individual
PPE	Personal Protective Equipment
SOP	Safety Operating Procedure

## 15.0 DOCUMENT HISTORY

DATE	TYPE	DESCRIPTION OF CHANGE
19 Jun 2023	Initial	New Document
	Revision 1	

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# HOT WORK PERMIT

**1. Date:**

**PERMIT IS VALID FOR ONE DAY ONLY**

**2. Hot Work Performed By:**

- County Employee  
 Contractor

<b>2. Location:</b>	<b>3. Department:</b>	<b>4. Name of Person Performing Hot Work:</b>  _____
<b>5. Description of Work:</b>  		(Print)  _____
<b>6. Start Time:</b> _____ <b>Stop Time:</b> _____ <input type="checkbox"/> AM <input type="checkbox"/> PM <input type="checkbox"/> AM <input type="checkbox"/> PM		(Signature)  _____
<b>7. Before approving any Hot Work Permit, the Permit Authorizing Individual (PAI) shall inspect the work area and ensure precautions have been taken to prevent fires as per National Fire Protection Association (NFPA) Standard 51B</b>		

GENERAL REQUIRMENTS:	N/A	YES	NO
Sprinkler systems and/or fire extinguishers serviceable and in good condition?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Equipment used for Hot Work serviceable and in good condition?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire extinguisher readily available?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Appropriate PPE on hand and in good condition?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
REQUIRMENTS WINTHIN 35FT OF HOT WORK:			
Flammable or combustibile materials a minimum of 35 feet away from working area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Flammable or combustibile materials that can't be moved, covered with welding blankets?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Explosive atmosphere eliminated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Floors swept and trash removed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Combustible floors wet down or covered with damp sand or welding blankets?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- If wet floors, are personnel protected from electrical shock hazards?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All wall and floor openings covered?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protect or shutdown ducts or conveyors that may carry sparks to distant combustibile material?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
REQUIRMENTS FOR HOT WORK ON ENCLOSED EQUIPMENT			
Equipment cleaned of all potential flammable/combustibile residue?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Containers purged of flammable liquid/vapor?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pressurized vessels, piping, and equipment removed from service. Isolated, and vented?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
REQUIRMENTS FOR HOT WORK IN A CONFINED SPACE			
Entry performed in accordance with SOP 5101-5025 <i>Confined Space Entry</i> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
REQUIRMENTS FOR FIRE WATCH			
Fire watch maintained for 1 hour (minimum) after completion of Hot Work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire extinguisher readily available and in the immediate area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**PERMIT APPROVAL**

I certify that the above location has been inspected, the proper precautions marked above have been taken, and thus permission is granted for this work.

**Name (Print):** \_\_\_\_\_ **Sign:** \_\_\_\_\_ **Date:** \_\_\_\_\_