

## **POLICY**

E & B Oilfield Services Inc. has adopted this policy for the prevention of employee exposure to hazards resulting either directly or indirectly from “Hot Work” (welding, cutting, and brazing) in the workplace, as specified by the following OSHA regulations:

## **REFERENCES**

- §1910.252 — General Requirements
- §1910.253 — Oxygen-fuel Gas Welding and Cutting
- §1910.254 — Arc Welding and Cutting
- §1926.350 — Gas welding and Cutting

## **RESPONSIBILITIES**

Kirk Duncan is the supervisor responsible for ensuring the following engineering controls, work practices, and safety procedures are enforced.

## **TRAINING**

E & B Oilfield Services Inc. has implemented this policy to ensure that employees are properly trained, aware of hazards associated with hot work, and correctly informed of Company policies, practices, and procedures to prevent, or if possible, eliminate these hazards.

## **SAFE PRACTICES**

Kirk Duncan will ensure that welders, cutters, and their supervisors involved in the performance of hot work operations are properly trained in the safe operations of any equipment required, the safe use of the process, proper personal protective equipment (PPE), and safety procedures which will be followed. If welding cannot be conducted safely, the welding and cutting will not be permitted.

Before cutting or welding processes are permitted, the area will be inspected and cleared by Kirk Duncan before authorization to proceed is granted. Written “Hot Work” permits will be utilized to ensure appropriate safe work practices are observed.

Cutting or welding will not be permitted in areas not authorized by management, in sprinkled buildings while such protection is impaired, in the presence of explosive atmospheres, or in areas near the storage of large quantities of exposed, readily ignitable materials.

Operators will report any equipment defect or safety hazard to their supervisor, and the use of the equipment will be discontinued until its safety has been assured. Repairs will be performed only by qualified employees.

Where possible, all hot work operations will be performed outside of buildings or structures, clear of any foreseeable fire hazards. If the object to be welded or cut cannot readily be moved, all moveable fire hazards will be removed.

Where hot work will be performed indoors or in the vicinity of fire hazards, the area will be cleared, if possible, of any and all material and equipment which may present a hazard of fire or explosion from flame, sparks, arcs, or slag.

Precautions will be taken so that no readily combustible materials on the floor below will be exposed to sparks which might drop through openings or cracks in the floor. The same precautions will be observed with regard to cracks or holes in walls, open doorways, and open or broken windows.

Where fire hazards exist in the area of hot work operations that cannot be removed, they will be guarded to prevent fire, and the hot work operation will be shielded to confine the heat sparks and slag and to protect the immovable fire hazards and prevent hot materials from falling to a lower level. Fire watchers will have fire extinguishers readily available. A fire watch will be maintained for at least one (1) hour or 60 minutes after the welding or cutting operation is completed to prevent or extinguish any fire resulting from these operations. In addition, a minimum two-hour surveillance period will be observed after completing any hot work.

The employee(s) assigned to fire watch will be trained in the proper use of fire extinguishers and fire prevention measures, ensure that appropriate fire-fighting equipment and fire extinguishers are readily available, and be responsible for sounding of fire alarms in the event of a fire which is not readily extinguishable. All arc welding operations in occupied areas will be screened to prevent other employees from being exposed to flash hazards.

Where practicable, all combustibles will be relocated at least 35 ft. from the work site. Where relocation is impracticable, combustibles will be protected with flameproof covers or otherwise shielded with metal or asbestos guards or curtains.

E & B Oilfield Services Inc. will be responsible for inspecting work areas before any hot work being performed (including the checking of fire suppression system status), designating precautions to be followed before work commences, and assigning a fire watch where advisable or required when any of the following conditions exist:

- Locations where other than a minor fire might develop.
- Appreciable combustible material, in building construction or contents, closer than 35 ft. to the point of operation.
- Appreciable combustibles are more than 35 ft. away but are easily ignited by sparks.
- Wall or floor openings within a 35 ft. radius that expose combustible material in adjacent areas, including concealed spaces in walls or floors.
- 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.

If the requirements for fire hazards and guarding, as stated above, cannot be fully met, E & B Oilfield Services Inc. employees will not perform the welding and cutting operations until hazardous conditions are fully resolved. Any hot work to be performed in confined spaces will conform to permit-required confined space procedures and the following requirements:

- Adequate ventilation is a prerequisite to work in confined spaces.
- When welding or cutting is being performed in any confined spaces, the gas cylinders and welding machines will be kept outside of the space. Before operations are started, gas cylinders will be secured, heavy portable equipment mounted on wheels will be securely blocked to prevent accidental movement, and warning signs will be posted.
- Where a welder will enter a confined space through a manhole or other small opening, means will be provided for quickly removing him in case of emergency. When safety belts and lifelines are used for this purpose, they will be so attached to the welder's body that his body cannot be jammed in a small exit opening. An attendant with a pre-planned rescue procedure will be stationed outside to observe the welder at all times and be capable of putting rescue operations into effect.

- When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes will be removed from the holders, and the holders stored so that accidental contact cannot occur, and the machine disconnected from the power source.
- In order to eliminate the possibility of gas escaping through leaks of improperly closed valves when gas welding or cutting, the torch valves will be closed, and the fuel-gas and oxygen supply to the torch positively shut off at some point outside the confined area, 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 will also be removed from the confined space.

Any welding or brazing materials used in hot work which might possibly generate hazardous fumes, gases, or dust to the metals involved will be suitably labeled to indicate the hazard and a local exhaust or general ventilating system will be provided and arranged to keep the amount of toxic fumes, gases, or dust below the maximum allowable concentration.

Welding, cutting, or burning of metals containing lead, zinc, cadmium, mercury, beryllium, or other exotic metals, paints, coatings, or preservatives will require that regulation ventilation or respiratory protection be utilized.

After welding or cutting operations are completed, the welder will mark the hot metal or provide some other means of warning other employees.

First aid kits and equipment are readily available at all times for employee use during welding and cutting operations. First aid kits are kept in all company vehicles and are regularly inspected by Kirk Duncan to ensure that contents are kept fully stocked and that the appropriate items are available.

Employees in charge of fuel-gas and oxygen supply equipment (including distribution piping systems and generators) will be fully instructed and determined competent for handling, use, and storage of compressed gas cylinders and related equipment.

The manufacturer's recommendations covering the operation and maintenance of oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems will be followed and readily available to employees.

Only approved apparatus such as torches, regulators, or pressure-reducing valves, acetylene generators, and manifolds will be used.

Employees exposed to the hazards created by welding, cutting, or brazing operations will be protected by PPE.

Goggles or other suitable eye protection will be used during all gas welding or oxygen cutting operations. 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.

Employees assigned to operate or maintain arc welding equipment will be properly trained and qualified to operate such equipment and in safety procedures and familiar with OSHA §1910.252(a)(b) and (c) and §1910.254 requirements for arc welding and equipment handling, to include the following areas: Machine hook up, grounding, electric shock, switches, manufacturers' instructions and electrode holders.

There will be no leaks of cooling water, shielding, gas, or engine fuel.

If gas-shielded arc welding operations are being performed, operators will be familiar with the American Welding Society Standard A6-1.

Machines that have become wet will be thoroughly dried and tested before being used.

Cables with damaged insulation or exposed bare conductors will be replaced. Joining lengths of work and electrode cables will be done by the use of connecting means specifically intended for the purpose. The connecting means will have insulation adequate for the service conditions.

Helmets or hand shields will be used during all arc welding or arc cutting operations.

The frame or case of the welding machine, except engine-driven machines, will be grounded.

Before starting operations, all connections to the machine will be checked to make certain they are properly made.

### **Transporting, Moving, and Storing Compressed Gas Cylinders**

Handling compressed gas cylinders safely is essential for preventing accidents and following regulations. Here are some important guidelines:

#### *Transport*

Valve protection caps will be in place and secured. When cylinders are hoisted, they will be secured on a cradle, slingboard, or pallet. They will not be hoisted or transported by means of magnets or choker slings. When cylinders are transported by powered vehicles, they will be secured in a vertical position.

#### *Moving*

Cylinders will be moved by tilting and rolling them on their bottom edges. They will not be intentionally dropped, struck, or permitted to strike each other violently.

Always use a cylinder cart to move compressed gas cylinders. Only one (1) cylinder will be moved at a time.

Valve protection caps will not be used for lifting cylinders from one (1) vertical position to another. Bars will not be used under valves or valve protection caps to pry cylinders loose when frozen. Warm, not boiling, water will be used to thaw cylinders loose. Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators will be removed and valve protection caps put in place before cylinders are moved. A suitable cylinder truck, chain, or other steadying device will be used to keep cylinders from being knocked over while in use. When work is finished, when cylinders are empty, or when cylinders are moved at any time, the cylinder valve will be closed. Compressed gas cylinders will be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

#### *Storing*

Cylinders will be stored in an upright position at least 20 ft. from any flammable gases or petroleum products and be kept away from radiators and other sources of heat.

Oxygen cylinders in storage will be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 ft. or 6.1 m or by a noncombustible barrier at least five (5) ft. or 1.5 m high having a fire-resistance rating of at least one-half (1/2) hour. Inside of buildings, cylinders will be stored in a well-protected, well-ventilated, dry location, at least 20 ft. or 6.1 m from highly combustible materials such as oil or excelsior. Cylinders will be stored in definitely assigned places away from elevators, stairs, or gangways. Assigned storage places will be located where cylinders will not be knocked over or damaged by passing or falling objects, or subject to tampering by unauthorized individuals. Cylinders will not be kept in unventilated enclosures such as lockers and cupboards. Empty cylinders will have their valves closed. Valve protection caps, where cylinder is designed to accept a cap, will always be in place except when cylinders are in use or connected for use.

Make sure all gas cylinders have clear labels and are kept in their designated, well-marked storage areas.

The in-plant handling, storage, and utilization of all compressed gases in cylinders, portable tanks, rail tankcars, or motor vehicle cargo tanks will be in accordance with Compressed Gas Association Pamphlet P-1-1965.

The above policies and procedures will be enforced at E & B Oilfield Services Inc..

### **EXOTHERMIC WELDING**

Exothermic welding (also known as exothermic bonding, thermite, or CAD welding) is frequently used for bonding electrical conductors for grounding, using a process that employs molten metal to permanently join the conductors. This method employs an exothermic reaction of a thermite composition to heat the metal and requires no external source of heat or current. The chemical reaction that produces the heat is an aluminothermic reaction between aluminum powder and a metal oxide. As the molten copper rapidly reaches temperatures of around 1,400 °C, the process has an obvious risk of burn injuries and the potential to start an unintentional fire.

The important safety concerns include:

- Proper PPE: Always wear safety glasses, gloves, proper footwear (e.g., leather boots).
- Clear the area of any and all flammable materials; keep a properly rated fire extinguisher handy.
- Inspect the welding molds: They will be clean, dry, proper size, in good condition (replace when worn).
- Protecting the materials from moisture (e.g., a drop of rain can cause a violent and dangerous reaction).
- Keep unused shots separated from the one being ignited (particularly important for railroad shots).
- Store all welds/molds in cool, dry locations and in properly labeled boxes.

Maintain a copy of the applicable safety data sheet (SDS) on file and on site.

**Hot Work Safety Checklist/Permit**

Hazard assessment will be completed and resolved before commencing welding, cutting, or heating operations. The authorized supervisor will sign off on this permit.

Hot Work Location		
Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	Is appropriate fire-extinguishing equipment ready for use?
<input type="checkbox"/>	<input type="checkbox"/>	Is all flammable material moved away from work zone or properly shielded?
<input type="checkbox"/>	<input type="checkbox"/>	Are drums, barrels, tanks, or other containers cleansed of flammable, explosive, or toxic residue that will react to heat?
<input type="checkbox"/>	<input type="checkbox"/>	Are containers tested before and frequently during welding, torching, abrasive cutting, or other hot works to ensure that the containers are free of flammable or toxic vapors?
<input type="checkbox"/>	<input type="checkbox"/>	Are shaded goggles or other suitable eye protection used when gas welding or oxygen cutting?
<input type="checkbox"/>	<input type="checkbox"/>	Are transparent face shields or goggles used when resistance welding or resistance brazing?
<input type="checkbox"/>	<input type="checkbox"/>	Do all welding helpers and equipment attendants use face or eye protection?
<input type="checkbox"/>	<input type="checkbox"/>	Are helmets and hand shields worn to protect the face, neck, and ears when arc welding?
<input type="checkbox"/>	<input type="checkbox"/>	Do lenses have permanent markings to show the source and shade?
<input type="checkbox"/>	<input type="checkbox"/>	Do all employees wear PPE when exposed to the hazards created by welding, cutting, or brazing?
<input type="checkbox"/>	<input type="checkbox"/>	Is clothing that is easily ignited or highly flammable, such as that made from synthetic materials, prohibited while welding, cutting, or brazing?
<input type="checkbox"/>	<input type="checkbox"/>	Are all electrodes removed from the holders and the machine turned off when arc welding is stopped for lunch or overnight?
<input type="checkbox"/>	<input type="checkbox"/>	Are the torch valves closed when gas welding or cutting is stopped for lunch or overnight?
<input type="checkbox"/>	<input type="checkbox"/>	Are only approved apparatus such as torches, regulators, or pressure-reducing valves used?
<input type="checkbox"/>	<input type="checkbox"/>	Are all compressed-gas cylinders legibly marked to identify the gas content?
<input type="checkbox"/>	<input type="checkbox"/>	Are all compressed-gas cylinders stored away from radiators and other sources of heat?
<input type="checkbox"/>	<input type="checkbox"/>	Do all compressed-gas cylinders have valve protection caps in place, hand-tight when not in use?
<input type="checkbox"/>	<input type="checkbox"/>	Are all compressed-gas cylinders securely lashed in place to prevent them from falling?
<input type="checkbox"/>	<input type="checkbox"/>	Are oxygen and fuel-gas cylinders stored separately by at least 20 ft. or by a noncombustible barrier at least five (5) ft. high with a fire-resistance rating of at least one-half (1/2) hour?
<input type="checkbox"/>	<input type="checkbox"/>	Are there signs in fuel-gas storage areas that read "DANGER – NO SMOKING, MATCHES OR OPEN LIGHTS" or equivalent wording?
<input type="checkbox"/>	<input type="checkbox"/>	Are regulators with cracked, broken, or defective parts removed from service?
<input type="checkbox"/>	<input type="checkbox"/>	Are approved back-flow valves or flash-back valves installed between the blowpipe or torch and the hoses?
<input type="checkbox"/>	<input type="checkbox"/>	Are arc welder lead cables or electrode lead cables with damaged insulation or exposed conductors removed from service?
Hot Work Permit Observations		
Assessor's Name:		
Signature		Date
Supervisor's Name		
Signature		Date



