Manual Section 7	Issue Date 03/17/10	Revision Date 01/01/24	Policy Number LLCP-117
	Welding & Cutting		

Purpose:
The established written welding & cutting procedures guidelines are to be followed whenever any employees work with welding and cutting equipment. These procedures establish uniform requirements designed to ensure that welding and cutting safety training, operation, and maintenance practices are communicated to and understood by the affected employees. These requirements also are designed to ensure that procedures are in place to safeguard the health and safety of all employees. First aid equipment shall be available at all times.

It is our intent to comply with the requirements of 29 CFR 1926.350 through .354. These regulations have requirements for welding and cutting operations. We also comply with applicable requirements of:

Standard or Regulation:	**Name:**
ANSI Z49.1-1967	*Safety in Welding and Cutting*
CGA Pamphlet P-1-1965	*Safe Handling of Compressed Gases*
29 CFR 1926, Subpart D	*Occupational Health and Environmental Controls*
29 CFR 1926, Subpart E	*Personal Protective And Life Saving Equipment*
29 CFR 1926.406(c)	*Electrical—Specific Purpose Equipment and Installations*
49 CFR 192	*Minimum Federal Safety Standards for Gas Pipelines*
49 CFR 178, Subpart C	*Specifications for Cylinders*

Scope
All LLC Companies including, Blanchard Industrial, LLC, GIS Engineering, LLC, Grand Isle Shipyard, Inc., and GWIS, Mack Steel, NuWave, Sun Industries, Valvemax, Discovery Industries, Inc.; hereafter identified as "Company".

Administrative Duties
The Safety Director is responsible for developing and maintaining the written Welding & Cutting Procedures. These procedures are kept at the each Divisional Safety Office.

Welding and Cutting Equipment
The Company uses the following welding and cutting equipment:

Make, model, and serial number:	Type:	Quantity:	Purpose and location:
* Oxygen-fuel gas welding: Joins metal parts by generating extremely high heat during combustion. *			

Training
It is Company policy to permit only trained and authorized personnel to operate welding and cutting equipment. The Corporate HSE Director will identify all new employees in the employee orientation program and make arrangements with department management to schedule training.

The following person(s) will conduct initial training and evaluation: Training Administrator. This instructor(s) has the necessary knowledge, training, and experience to train new welding and cutting equipment operators. Their qualifications include: specific knowledge, training, and/or experience.

Initial Training
Classroom instruction includes the following formats: Lecture, discussion & videotapes, Classroom instruction covers the following topics: PPE, HAZ COM, Fire Protection and other topics.

General Industry Employers
As a general statement, only trained personnel may operate or maintain welding, cutting, or brazing equipment (1910.252(a)(2)(xiii)(C)). This is stated clearly for arc welding in 1910.254(a)(3) and for resistance welding in 1910.255(a)(3). The regulations require an inspection by the individual responsible for authorizing cutting and welding before work begins and to designate precautions to be followed. This implies the person must be trained and knowledgeable in welding. Firewatchers are required in many instances in welding operations. They must be familiar with the alarm system and try to put out fires only when obviously within the capability of the equipment available. When using oxygen or fuel-gas supply equipment, including generators and fuel-gas distribution systems, allow only personnel properly instructed and judged competent by their employers to be left in charge. Permit only skilled mechanics that have been properly instructed to perform work on regulators or gages. This requirement is generally applied to welding equipment throughout the regulations. Only qualified maintenance personnel may make the inspections required under 1910.255(e) for welding machines.

Construction Employers
Gas Welding and Cutting: For gas welding and cutting, no person other than the gas supplier shall attempt to mix gases in a cylinder. No one except the owner of the cylinder or person authorized by him/her shall refill a cylinder. No one shall use a cylinder's contents for purposes other than those intended by the supplier. All cylinders used shall meet 49 CFR 178, Subpart C, and Specification for Cylinders. These requirements indicate some type of training. The Company must thoroughly instruct employees in the safe use of fuel gas according to 29 CFR 1926.350(d)(1)-(6).

All hoses in use, carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion, or be in any way harmful to employees, shall be inspected at the beginning of each working shift (1926.350(f)(3)). Any hose which has been subject to flashback, or which shows evidence of severe wear or damage, must be tested to twice the normal pressure to which it is subject, but in no case less than 300 P.S.I. (1926.350(f)(4)). These inspections and tests imply the person must be trained and knowledgeable.

Clogged torch tip openings must be cleaned with suitable cleaning wires, drills, or other devices designed for such purpose (1926.350(g)(1)). Torches in use must be inspected at the beginning of each working shift for leaking shutoff valves, hose couplings, and tip connections (1926.350(g)(2)). These inspections imply the person must be trained and knowledgeable.

When arc welding and cutting, if a structure or pipeline is continuously employed as a ground return circuit, all joints must be bonded, and periodic inspections must be conducted to ensure that no condition of electrolysis or fire hazard exists by virtue of such use (1926.351(c)(4)). These requirements indicate some type of training.

For arc welding and cutting machines, all grounding circuits, other than by means of the structure, must be checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit current to flow to cause the fuse or circuit breaker to interrupt the current (1926.351(c)(5)). These requirements indicate some type of training.

All ground connections must be inspected to ensure that they are mechanically strong and electrically adequate for the required current (1926.351(c)(6)). These requirements indicate some type of training.

Employers must instruct employees in the safe means of arc welding and cutting according to 1926.351(d)(1)-(5) and 1926.406(c). When the welding, cutting, or heating operation is such that normal fire prevention precautions are not sufficient, additional personnel must be assigned to guard against fire while the actual welding, cutting, or heating operation is being performed, and for a sufficient period of time after completion of the work to ensure that the possibility of fire exists. Such a person must be instructed as to the specific anticipated fire hazards and how the firefighting equipment provided is to be used (1926.352(e)).

When sufficient ventilation cannot be obtained without blocking the means of access, employees in a confined space must be protected by air line respirators in accordance with the requirements of 1926, Subpart E, and an employee on the outside of such a confined space must be assigned to maintain communication with those working within it and to aid them in an emergency (1926.353(b)(2)). These requirements indicate some type of training.

Where a welder must enter a confined space through a manhole or other small opening, an attendant with a pre-planned rescue procedure must be stationed outside to observe the welder at all times and be capable of putting rescue operations into effect (1926.353(b)(3)). These requirements indicate some type of training.

Where welding, cutting, or heating in any enclosed spaces is to be performed involving metals of toxic significance according to 1926.353(c), local exhaust ventilation is required, or employees must be protected by air line respirators according to 1926, Subpart E. Employees performing such operations in the open air must be protected by filter-type respirators in accordance with the requirements of 1926, Subpart E, except that employees performing such operations on beryllium-containing base or filler metals must be protected by air line respirators according to 1926, Subpart E. Other employees exposed to the same atmosphere as the welders or burners must be protected in the same manner as the welder or burner (1926.353(c)(3)-(4)). These requirements indicate some type of training.

When two or more welders are exposed to each other's arc, filter lens goggles of a suitable type, meeting the requirements of 1926, Subpart E, must be worn under welding helmets (1926.354(d)(1)(ii)). These requirements indicate some type of training.

Employees performing any type of welding, cutting, or heating must be protected by suitable eye protective equipment according to 1926, Subpart E (1926.354(e)(2)). These requirements indicate some type of training.

Before welding, cutting, or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test must be made by a competent person to determine its flammability (1926.354(a)). These requirements indicate some type of training.

In enclosed spaces, all surfaces covered with toxic preservatives must be stripped of all toxic coatings for a distance of at least 4 inches from the area of heat application, or the employees must be protected by air line respirators, meeting the requirements of 1926, Subpart E. (1926.354(c)(1)). In the open air, employees must be protected by a respirator according to 1926, Subpart E. (1926.354(c)(2)) These requirements indicate some type of training.

The Company's practical training includes these formats: Demonstrations, practical exercises, and hands-on instruction. All welders and cutters are trained and tested on the equipment they will be operating before they begin their jobs. This practical training covers the following:

- General welding and cutting procedures and proper PPE use.

During training, the Company will cover the operational hazards of welding and cutting operations, which includes:

- Hazards associated with the particular make and model of the welding and cutting equipment;
- Hazards of the workplace; and
- General hazards that apply to the operation of all or most welding and cutting equipment.

See project specific JSEA specific hazards of Company welding and cutting equipment and Company workplace.

Each potential welder or cutter who has received training in any of the elements of the training program for the types of equipment which that employee will be authorized to operate, and for the type of workplace in which the welding and cutting equipment will be operated, need not be retrained in those elements before initial assignment in our workplace if the Company has written documentation of the training and if the employee is evaluated to be competent. Training is conducted in-house.

Training Certification

After an employee has completed the training program, the instructor will determine whether the potential welder or cutter can safely perform the job. At this point, the trainee will take a performance test or practical exercise through which the instructor(s) will decide if the training has been adequate. All welding and cutting trainees are tested on the equipment they will be operating.

The Corporate HSE Director is responsible for keeping records certifying that each employee who has successfully completed training and testing. Each certificate includes the name of the employee, the date(s) of the training, and the signature of the person who did the training and evaluation.

Performance Evaluation

Each certified welder or cutter is evaluated to verify that the welder or cutter has retained and uses the knowledge and skills needed to operate safely. Clients for which the Company works do this evaluation. If the evaluation shows that the welder or cutter is lacking the appropriate skills and knowledge, the welder or cutter is retrained by Company instructor(s). When a welder or cutter has an accident or near miss or some unsafe operating procedure is identified, retraining is conducted. All employees have a general obligation to work safely with and around welding and cutting operations.

Compressed Gas Cylinders

Handling, storage, and use of compressed gases around the job site represent a number of hazards. Questions should be resolved through supervisors or use of the Compressed Gas Association Pamphlet P-1-1965.B, if available. Approved practices include:

- Keep valve protection cap in place at all times when a cylinder is not in use.
- When cylinders are hoisted, secure them on a cradle, sling board, or pallet.
- Move cylinders by tilting and rolling on their bottom edges. Care in handling is required.
- Secure cylinders in an upright position at all times, especially when moving them by machine.
- Use carriers or carts provided for the purpose when cylinders are in use.
- When in use, isolate cylinders from welding or cutting or suitably shielding. Care will be taken to prevent them from becoming part of an electrical circuit.
- Maintain a distance of at least 20 feet or provide a non-combustible barrier at least five feet high in separating fuel gas cylinders from oxygen cylinders. This applies to indoor and outdoor storage.

The site supervisor will designate:

- Well-ventilated storage areas for cylinders inside buildings. Care will be taken to keep storage areas out of traffic areas or other situations where they could be knocked over, damaged or be tampered with.
- Locations for fuel gas and oxygen manifolds in well-ventilated areas.

Prohibited practices include

- Use of valve protection caps for lifting cylinders.
- Use of damaged or defective cylinders. The site supervisor will provide appropriate tags and designate an appropriate storage area for these cylinders.
- Mixing of gases.
- Use of a magnet or choker sling when hoisting cylinders.
- Use of a bar to pry cylinders from frozen ground. Warm, not boiling, water is used to thaw cylinders.
- Taking oxygen, acetylene, or other fuel gas or manifolds with these gases into confined spaces.

Gas Welding and Cutting

Safe practices in using compressed gases and torches include:

- Cracking cylinders and attaching regulators according to industry practice.
- Putting caps on header hose connections and manifolds when not in use.
- Keeping all hoses, regulators, cylinders, valve protection caps, couplings, apparatus, and torch connections free of grease and oil, especially those involving oxygen.
- Using fuel gas hose and oxygen hose of different colors.

Inspections

- All hoses before every shift.
- All torches. Only devices designed for the purpose will be used to clean torch tips.
- Use only friction lighters to ignite torches.
- Removal of torches and hoses and positive shut-off of gas sources from confined spaces when leaving a confined space project for any substantial period of time.

Prohibited practices include

- Interchange of hoses, including use of adapters, between fuel gas and oxygen sources.
- Placement of anything on or near a manifold or cylinder top that may interfere with the prompt shut-off in case of an emergency.
- Taping more than four inches out of every 12 inches in joining fuel gas and oxygen hoses.
- Using defective hose or torches.
- Use of oxygen for personal cooling, cleaning off of surfaces, ventilation or blowing dust from clothing.

Arc Welding and Cutting

Safe practices in using arc welders include:

- Use of holders, cables, and other apparatus specifically designed for the purpose, matched to the job and other components and in good repair.
- Following Department Of Transportation standards for welding on natural gas pipelines.
- When leaving electrode holders unattended, electrodes are removed and holders placed so that accidental electrical contact is not made.
- Turning off the arc welding or cutting machine when it is to be left unattended for a substantial period of time or when it is being moved.
- Immediate reporting of any defective equipment to the site supervisor.
- Use of non-combustible or flameproof screens to protect employees and passersby from arc rays wherever practicable.
- Keeping chlorinated solvents at least 200 feet from an inert-gas, metal-arc welder or providing adequate shielding. Surfaces prepared with chlorinated solvents will be thoroughly dry before welding.

Prohibited Practices

- Using cables with repairs or splices within 10 feet of the holder that are not equivalent in insulating value to the original cable.
- Use of pipelines with flammable gases or liquids or conduits with electrical circuits as ground return.
- Dipping hot electrode holders into water.

Fire Prevention

The site supervisor will use this guide to assess fire hazards at a job site:

- When the object to be welded cut or heated can be moved, and a fire-resistant, safe workspace is available, then the welding, cutting, brazing, or heating must be done in that space.
- When the object to be welded, cut, or heated can be moved, and all fire hazards can be moved to a safe distance, then the welding, cutting, brazing or heating can be done.
- When the object to be welded, cut, or heated cannot be moved, and all the fire hazards cannot be removed, then guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.
- When there is a welding, cutting, or heating task, and concentrations of flammable paints, dusts, or other flammable compounds are present, and then welding, cutting, brazing or heating is not allowed.

Employee Requirements

All employees will be required to:

- Have a firewatch in attendance when they are welding.
- Remove all combustible material at least 35 feet from the work area, move away from combustible materials or cover combustibles with fire resistant material.
- Not weld in atmospheres containing dangerously reactive or flammable gases, vapors, liquid, or dust.
- Clean and purge containers that may have held combustible material before applying heat.
- Get a hot work permit and follow its safety precautions.

The company will provide suitable fire extinguishing equipment based on the site supervisor's assessment of hazards. The site supervisor will ensure the equipment is maintained for immediate use.

Fire Watch

When normal fire prevention measures are not sufficient, the company, based on the site supervisor's assessment, assigns firewatchers. Fire watchers will provide additional safeguards against fire during and at least 30 minutes after operations. The company will provide training for firewatchers on the specific fire hazards and equipment available.

Ventilation

The site supervisor will determine the number, location, and capacity of ventilation devices. Where ventilation is not sufficient to provide clean, respirable air, respirators will be specified according to the provisions in the Personal Protective Equipment section. Ventilation will be sufficient to protect passersby as well as the welder.

Employee Requirements

Employees will be required to

- Know the symptoms of fumes and gases and get out of the area if they should develop.
- Perform atmospheric tests.
- Keep a safe distance from the fume or gas plume.

Personal Protective Equipment

Airline respirators will be provided for confined space jobs when sufficient ventilation cannot be provided without blocking the exit. Employees will be trained on the proper use of their respirators. When known or unknown toxic materials are present in a job, respirators will be provided that match the hazard for all employees. The hazards include zinc or zinc-bearing base or filler metals, lead base metals, cadmium-bearing filler metals, chromium-bearing or chromium-coated metals, mercury, nitrogen dioxide, and beryllium. Due to beryllium's extreme danger, both ventilation and airline respirators will be used. Where screens are not sufficient to protect welders and passersby from arc radiation, the company will provide eye protection with appropriate helmets, ANSI approved filter lens goggles, or hand shields. The helmets and shields will be maintained in good repair. When a toxic preservative is detected on a surface in a confined space, airline respirators will be provided (or the toxic coating will be stripped from at least four inches around the heated area).

Other Acceptable PPE

- Flame resistant aprons to protect against heat and sparks.
- Leggings and high boots for heavy work.
- Ankle-length safety shoes worn under pant legs to keep from catching slag.
- Shoulder cape and skullcap to protect against overhead welding.
- Earplugs or earmuffs on very noisy jobs like high velocity plasma torches.
- Insulated gloves to protect against contact with hot items and radiation exposure.
- Safety helmets to protect against sharp or falling objects.

Employees are asked to wear wool, leather, or cotton treated clothing to reduce flammability for gas shielding arc welding. Long sleeves and pants without cuffs/front pockets are recommended to avoid catching sparks.

Confined Spaces

- Confined spaces, such as manholes, tunnels, trenches and vaults, are particularly hazardous working areas made more dangerous by welding. Ventilation is a primary consideration and will be designated by the site supervisor or other competent employee designated by the company.
- See the Personal Protective Equipment section above for provision of respirators.
- An employee (attendant) will be stationed outside the confined space to maintain communication with those entering and ready to render emergency assistance when respirators are used.
- When confined spaces are entered through a manhole or similar small opening, the company will provide a means of quickly removing a worker. An attendant with a rescue procedure will observe the worker at all times and be able to put the rescue plan into effect.
- Limited workspaces, hazardous atmospheres, slippery floor surfaces and interior surfaces of the space will be evaluated for flammability.

Flammable, Toxic, or Hazardous Materials

- The company will designate a competent person to test the flammability of unknown coatings.
- When a coating is found to be highly flammable, such as lead-painted surfaces, it will be stripped from the area to prevent fire.

Electrical Equipment

Approved safe practices include:

- Arc welding will not be done while standing on damp surfaces or in damp clothing.
- Equipment will be properly grounded, installed, and operated.
- Defective equipment will not be used.
- Well-insulated electrode holders and cables will be used.
- Employees should insulate themselves from both the work and the metal electrode and holder.
- Welding cables must not be wrapped around the welder's body.
- Employees should wear dry gloves and rubber-soled shoes.
- No damaged or bare cables and connectors will be used.
- In case of electric shock, a victim should not be touched. Current should be turned off at the control box and then call for help. After the power is off, cardio-pulmonary resuscitation (CPR) may be performed if necessary.

Fall Protection

A platform with railings, or safety harness and lifeline will be used when welding or cutting above ground or floor levels and there are falling hazards. A clear welding or cutting area will be maintained to prevent slips, trips, and falls.

Fire Concerns

- Locations where other than a minor fire might develop.
- Combustible materials closer than 35 ft. (10.7M) to point of operation.
- Combustibles that are 35 ft. (10.7M) or more away but are easily ignited.
- Wall or floor openings within 35 feet (10.7M) radius expose combustible materials.
- Combustible materials are adjacent to the opposite side of metal partitions, ceilings or roofs.

Inspections

A number of inspections are required under the welding and cutting regulations. To make inspections efficient, we have compiled a list of inspection items to be checked before welding or cutting.

Inspection Regulations for General Industry:

29 – (CFR 1910.252) General requirements

(a)(2)(iv) Authorization. Before cutting or welding is permitted, the individual responsible for authorizing cutting and welding operations shall inspect the area. He shall designate precautions to be followed in granting authorization to proceed preferably in the form of a written permit.

(b)(2)(i)(B) Goggles or other suitable eye protection shall 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.

(d)(1)(vii) X-ray inspection. The use of X-rays and radioactive isotopes for the inspection of welded pipeline joints shall be carried out in conformance with the American National Standard Safety Standard for Non-Medical X-ray and Sealed Gamma-Ray Sources, ANSI-Z54.1-1963, which is incorporated by reference as specified in 29 CFR 1910.6.

(d)(2)(ii) X-ray inspection. The use of X-rays and radioactive isotopes for the inspection of welded piping joints shall be in conformance with the American National Standard Safety Standards for Non-Medical X-ray and Sealed Gamma-Ray Sources, ANSI Z54.1-1963.

29 CFR 1910.253 Oxygen-fuel gas welding and cutting.

(e)(6)(iv) Union nuts and connections on regulators shall be inspected before use to detect faulty seats which may cause leakage of gas when the regulators are attached to the cylinder valves.

29 CFR 1910.255 Resistance welding

(e) Maintenance. Qualified maintenance personnel shall make periodic inspection, and a certification record maintained. The certification record shall include the date of inspection, the signature of the person who performed the inspection and the serial number, or other identifier, for the equipment inspected. The operator shall be instructed to report any equipment defects to his supervisor and the use of the equipment shall be discontinued until safety repairs have been completed.

Sample Inspection Checklist for General Industry: Welding

- Are only authorized and trained personnel permitted to use welding, cutting or brazing equipment? 29 CFR 1910.252(a)(2)(xiii)(C)
- Does each operator have a copy of the appropriate operating instructions and are they directed to follow them? 29 CFR 1910.253(a)(4), (d)(6), (f)(7)(A)
- Are pressure-reducing regulators used only for the gas and pressures for which they are intended? 29 CFR 1910.253(e)(6)(i)
- Is grounding of the machine frame and safety ground connections of portable machines checked periodically? 29 CFR 1910.254(d)(3); 255(b)(9), (c)(6)
- Are only approved apparatus (torches, regulators, pressure-reducing valves, acetylene generators, manifolds) used? 29 CFR 1910.253(a)(3)
- Is a check made for adequate ventilation in and where welding or cutting is performed? 29 CFR 1910.252(c)(1)(iii), (2)(i)
- When working in confined places, are environmental monitoring tests taken and means provided for quick removal of welders in case of an emergency? 29 CFR 1910.252(c)(4) WELDING EQUIPMENT
- Is necessary personal protective equipment available? 29 CFR 1910.252(b)(2)
- Are only approved apparatus (torches, regulators, pressure-reducing valves, acetylene generators, manifolds) used? 29 CFR 1910.253(a)(3)
- Is open circuit (No Load) voltage of arc welding and cutting machines as low as possible and not in excess of the recommended limits? 29 CFR 1910.254(b)(3)(i)-(iv)
- Is grounding of the welding machine frame and safety ground connections of portable machines checked periodically? 29 CFR 1910.254(d)(3); .255(b)(9), (c)(6) EQUIPMENT MARKINGS
- Is red used to identify acetylene (and other fuel-gas) hose, green for oxygen hose, and black for inert gas and air hose? 29 CFR 1910.253(e)(5)(i)
- Are empty compressed gas cylinders appropriately marked and their valves closed? 29 CFR 1910.101(b); .253(b)(1)(ii), (2)(iii), (5)(ii)(H)

Compressed Gas Cylinder Management

- Are compressed gas cylinders regularly examined for obvious signs of defects, deep rusting, or leakage? 29 CFR 1910.254(d)(4); 255(e)
- Is care used in handling and storage of cylinders, safety valves, relief valves, etc., to prevent damage? 29 CFR 1910.253 (b)(2)(ii), (5)(iii)(B)
- Are liquefied gases stored and shipped valve-end up with valve covers in place? 29 CFR 1910.253(b)(5)(iii)(A)
- Before a regulator is removed, is the valve closed and gas released from the regulator? 29 CFR 1910.253(b)(5)(iii)(D)
- Are cylinders, cylinder valves, couplings, regulators, hoses, and apparatus kept free of oily or greasy substances? 29 CFR 1910.253(b)(5)(i)
- Are the cylinders kept away from elevators, stairs, or gangways? 29 CFR 1910.253(b)(2)(ii)
- Is it prohibited to use cylinders as rollers or supports? 29 CFR 1910.253(b)(5)(ii)(K)
- Is care taken not to drop or strike cylinders? 29 CFR 1910.253(b)(5)(ii)(B)
- Unless secured on special trucks, are regulators removed and valve-protection caps put in place before moving cylinders? 29 CFR 1910.253(b)(5)(ii)(D)
- Do cylinders without fixed hand wheels have keys, handles, or non-adjustable wrenches on stem valves when in service? 29 CFR 1910.253(b)(5)(ii)(E)
- Are empty compressed gas cylinders appropriately marked and their valves closed? 29 CFR 1910.253(b)(1)(ii), (2)(iii), (5)(ii)(H)
- Are fuel gas cylinders and oxygen cylinders separated by distance, fire resistant barriers, etc., while in storage? 29 CFR 1910.253(b)(4)(iii)

Personal Protective Equipment

- Are all employees required to use personal protective equipment (PPE) as needed? 29 CFR 1910.132(a)
- Is PPE functional and in good repair? Does it have ANSI or ASTM specifications marked on it? 29 CFR 1910.132(e)
- Are employees exposed to the hazards created by welding, cutting, or brazing operations protected with personal protective equipment and clothing? 29 CFR 1910.252(b)(3)
- Is personal protective equipment provided and are all employees required to use PPE as needed to protect against eye and face injury? 29 CFR 1910.132(a); .133(a)(1)
- Are protective goggles or face shields provided and worn where there is any danger of flying particles or corrosive materials? 29 CFR 1910.133(a)(1)
- Are approved safety glasses required to be worn at all times in areas where there is a risk of eye injuries such as punctures, abrasions, contusions, or burns? 29 CFR 1910.133(a)(2)
- Are appropriate safety glasses, face shields, etc., used while using hand tools or equipment that might produce flying materials or be subject to breakage? 29 CFR 1910.133(a)(1)
- Are employees who need corrective lenses (glasses or contacts) in working environments having harmful exposures required to wear only approved safety glasses, protective goggles, or use other medically approved precautionary procedures? 29 CFR 1910.133(a)(3)
- Is appropriate foot protection required where there is the risk of foot injury? 29 CFR 1910.132(a); .136(a)
- Is appropriate hand protection required where there is the risk of hand injury? 29 CFR 1910.132(a); .138(a)
- Are hard hats provided and worn where danger of falling objects exists? 29 CFR 1910.135(a)(1)
- Are hard hats inspected periodically for damage to the shell and suspension system? 29 CFR 1910.135(b)

Air Emissions

- If welding creates hazardous air emissions, is the welding area appropriately marked to indicate this? 29 CFR 1910.252(c)(iv)(A)-(C)
- If welding creates hazardous air emissions, have ventilation or local exhaust systems been provided to keep fumes below the maximum allowable concentrations? 29 CFR 1910.252(c)(iii) FIRE PREVENTION
- Are precautions taken to prevent the mixture of air or oxygen with flammable gases, except at a burner or in a standard torch? 29 CFR 1910.253(a)(1)
- Are signs reading DANGER NO SMOKING, MATCHES, OR OPEN LIGHTS or the equivalent, posted in welding areas?
- Are provisions made to never crack a fuel-gas cylinder valve near sources of ignition? 29 CFR 1910.253(b)(5)(iii)(C)
- When welding is done on metal walls, are precautions taken to protect combustibles on the other side? 29 CFR 1910.252(a)(2)(x)
- Before hot work is begun, are used drums, barrels, tanks, and other containers so thoroughly cleaned that no substances remain that could explode, ignite, or produce toxic vapors? 29 CFR 1910.252(a)(3)(i)
- If welding gases are stored, does a 5-foot noncombustible barrier separate oxygen and acetylene? 29 CFR 1910.253(b)(4)(i)-(iii)
- Are compressed gas cylinders kept away from sources of heat? 29 CFR 1910.253(b)(2)(i)
- Is combustible scrap, debris, and waste stored safely and removed from the work site promptly? 29 CFR 1910.252 (a)(2)(i), (vii), (xiv)(C)(2)
- Are firewatchers assigned when welding or cutting is performed in locations where a serious fire might develop? 29 CFR 1910.252(a)(2)(iii)(A)
- Are provisions made for personnel to perform fire watch duties under appropriate circumstances? 29 CFR 1910.252(d)(4)(iv)

Fire Alarm Systems

- If you have a non-supervised fire alarm system, is it tested bimonthly? 29 CFR 1910.165(d)(2)
- If you have a supervised employee alarm system (that is, does the alarm have a device that indicates system malfunction), is it tested yearly? 29 CFR 1910.165(d)(4) PORTABLE FIRE EXTINGUISHERS
- Are appropriate fire extinguishers mounted, located, and identified so that they are readily accessible to employees? 29 CFR 1910.157(c)(1)
- Are all fire extinguishers inspected and recharged regularly, and noted on the inspection tag? 29 CFR 1910.157(e)
- Are portable fire extinguishers provided in adequate number and type? 29 CFR 1910.157(d) AISLES
- Are aisles marked? 29 CFR 1910.22(b)(2)
- Are aisle widths maintained? 29 CFR 1910.22(b)(1)
- Are aisles in good condition? 29 CFR 1910.22(b)(1)
- Are aisles and passageways properly illuminated? 29 CFR 1910.22
- Are aisles kept clean and free of obstructions? 29 CFR 1910.22(b)(1)

Inspection Regulations for Construction

29 CFR 1926.350 Gas welding and cutting

(f)(3) All hose in use, carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion, or be in any way harmful to employees, shall be inspected at the beginning of each working shift. Defective hose shall be removed from service. (g)(2) Torches in use shall be inspected at the beginning of each working shift for leaking shutoff valves, hose couplings, and tip connections. Defective torches shall not be used.

29 CFR 1926.351 Arc welding and cutting

(c)(5) The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current. Grounding circuits, other than by means of the structure, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current. (c)(6) All ground connections shall be inspected to ensure that they are mechanically strong and electrically adequate for the required current.

Maintenance

Any deficiencies found in our welding and cutting equipment are repaired, or defective parts replaced, before continued use. However, no modifications or additions that affect the capacity or safe operation of the equipment may be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, must be changed accordingly. In no case may the original safety factor of the equipment be reduced.

While defective parts may be found, we prefer to invest time and effort into the proper upkeep of our equipment, which results in day-to-day reliability. Keeping up with the manufacturer's recommended maintenance schedules, and completing the proper records, will also increase our welding and cutting equipment's longevity.

The Purchasing Department complete(s) a receiving or delivery inspection whenever our company purchases welding and cutting equipment.

Each welder performs their own maintenance because they are owned by the employee and follow(s) the manufacturer's operator instruction manual for daily or weekly maintenance. Periodic maintenance (those completed monthly or less frequently) is done by a factory-trained-expert, or a dealer.

Signs and Labels
Our company posts signs as follows:

Sign and Label Regulations for General Industry

29 CFR 1910.252 General requirements for welding, cutting, and brazing

(b)(2)(ii)(G) Lenses shall bear some permanent distinctive marking which may readily identify the source and shade. (b)(4)(vii) Warning sign. After welding operations are completed, the welder shall mark the hot metal or provide some other means of warning other workers.
(c)(1)(iv) Precautionary labels. A number of potentially hazardous materials are employed in fluxes, coatings, coverings, and filler metals used in welding and cutting or are released to the atmosphere during welding and cutting. These include but are not limited to the materials itemized in paragraphs (c)(5) through (c)(12) of this section. The suppliers of welding materials shall determine the hazard, if any, associated with the use of their materials in welding, cutting, etc.
(c)(1)(iv)(A) All filler metals and fusible granular materials shall carry the following notice, as a minimum, on tags, boxes, or other containers: CAUTION Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. Use adequate ventilation. See ANSI Z49.1-1967 Safety in Welding and Cutting published by the American Welding Society.
(c)(1)(iv)(B) Brazing (welding) filler metals containing cadmium in significant amounts shall carry the following notice on tags, boxes, or other containers: WARNING CONTAINS CADMIUM--POISONOUS FUMES MAY BE FORMED ON HEATING Do not breathe fumes. Use only with adequate ventilation such as fume collectors, exhaust ventilators, or air-supplied respirators. See ANSI Z49.1-1967. If chest pains, cough, or fever develops after use call physician immediately.
(c)(1)(iv)(C) Brazing and gas welding fluxes containing fluorine compounds shall have a cautionary wording to indicate that they contain fluorine compounds. One such cautionary wording recommended by the American Welding Society for brazing and gas welding fluxes reads as follows: CAUTION CONTAINS FLUORIDES This flux when heated gives off fumes that may irritate eyes, nose and throat. Avoid fumes--use only in well-ventilated spaces. Avoid contact of flux with eyes or skin. Do not take internally.

29 CFR 1910.253 Oxygen-fuel gas welding and cutting

(b)(1)(ii) Compressed gas cylinders shall be legibly marked, for the purpose of identifying the gas content, with either the chemical or the trade name of the gas. Such marking shall be by means of stenciling, stamping, or labeling, and shall not be readily removable. Whenever practical, the marking shall be located on the shoulder of the cylinder. This method conforms to the American National Standard Method for Marking Portable Compressed Gas Containers to Identify the Material Contained, ANSI Z48.1-1954, which is incorporated by reference as specified in 29 CFR 1910.6.
(b)(5)(iii)(G) A warning should be placed near cylinders having leaking fuse plugs or other leaking safety devices not to approach them with a lighted cigarette or other source of ignition. Such cylinders should be plainly tagged; the supplier should be promptly notified and his instructions followed as to their return.
(c)(3)(v) The following sign shall be conspicuously posted at each manifold: Low-Pressure Manifold Do Not Connect High-pressure Cylinder Maximum Pressure--250 psig (1.7 MPa)
(d)(4)(ii) Aboveground piping systems shall be marked in accordance with the American National Standard Scheme for the Identification of Piping systems, ANSI A13.1-1956, which is incorporated by reference as specified in 29 CFR 1910.6. 06-01-96 (d)(4)(iii) Station outlets shall be marked to indicate the name of the gas. (e)(6)(iii) Gages on oxygen regulators shall be marked USE NO OIL.

(f) Acetylene generators (1) Approval and marking. (i) Generators shall be of approved construction and shall be plainly marked with the maximum rate of acetylene in cubic feet per hour for which they are designed; the weight and size of carbide necessary for a single charge; the manufacturers name and address; and the name of number of the type of generator. (f)(1)(ii) Carbide shall be of the size marked on the generator nameplate. (f)(2) Rating and pressure limitations. (i) The total hourly output of a generator shall not exceed the rate for which it is approved and marked. Unless specifically approved for higher ratings, carbide-feed generators shall be rated at 1 cubic foot (0.028 m3) per hour per pound of carbide required for a single complete charge. (f)(7)(i)(A) Operating instructions shall be posted in a conspicuous place near the generator or kept in a suitable place available for ready reference. (g)(1)(ii) Packages containing calcium carbide shall be conspicuously marked CALCIUM CARBIDE--DANGEROUS IF NOT KEPT DRY or with equivalent warning.

29 CFR 1910.254 Arc welding and cutting

(b)(4)(iv) Terminals for welding leads should be protected from accidental electrical contact by personnel or by metal objects, i.e., vehicles, crane hooks, etc. Protection may be obtained by use of: Dead-front receptacles for plug connections; recessed openings with no removable hinged covers; heavy insulating sleeving or taping or other equivalent electrical and mechanical protection. If a welding lead terminal which is intended to be used exclusively for connection to the work is connected to the grounded enclosure, it must be done by a conductor at least two AWG sizes smaller than the grounding conductor and the terminal shall be marked to indicate that it is grounded.

Sign and Label Regulations for Construction

29 CFR 1926.350 Gas welding and cutting

(d)(5) If, when the valve on a fuel gas cylinder is opened, there is found to be a leak around the valve stem, the valve shall be closed and the gland nut tightened. If this action does not stop the leak, the use of the cylinder shall be discontinued, and it shall be properly tagged and removed from the work area. In the event that fuel gas should leak from the cylinder valve, rather than from the valve stem, and the gas cannot be shut off, the cylinder shall be properly tagged and removed from the work area. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seat, the cylinder need not be removed from the work area. (e)(1) Fuel gas and oxygen manifolds. Fuel gas and oxygen manifolds shall bear the name of the substance they contain in letters at least 1-inch high which shall be either painted on the manifold or on a sign permanently attached to it.

Record Keeping

Job site is responsible for maintaining the following records:
RECORD KEEPING REGULATIONS FOR CONSTRUCTION: None specifically stated in welding and cutting regulations.