	ANC Foster Pty Ltd Safety Management System		Doc No:	WELDING
			Initial Issue Date	27 Apr 2010
WELDING			Revision Date:	Initial Version
			Revision No.	0
Preparation: Safety Mgr			Next Revision Date:	27 Apr 2011
			Authority: Director	Issuing Dept: Safety

Purpose

The purpose of this program is to assure a safe work environment during welding, cutting and hot work operations.

Scope

This program is applicable to all employees directly involved or assisting in the welding operations. When work is performed on a no owned or operated site, the operator's program shall take precedence, however, this document covers ANC Foster employees and contractors and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

Operators of equipment should report any equipment defect or safety hazards and discontinue use of equipment until its safety has been assured. Repairs shall be made only by qualified personnel. If welding and cutting cannot be conducted safely the welding and cutting operation shall not be performed.

Key Responsibilities

Managers and Supervisors

- Determine if its property is safe for welding and cutting operations.
- Establish safe areas for welding and cutting operations.
- Provide training for all employees whose task includes heat, spark or flame producing operations such as welding, brazing, or grinding.
- Develop and monitor effective hot work procedures.
- Provide safe equipment for hot work.
- Provide proper and effective PPE for all hot work.
- Monitor all hot work operations.
- Ensure all hot work equipment and PPE are in safe working order.
- Allow only trained and authorized employees to conduct hot work and conduct inspections of the hot work area before operations begin.


Employees

- Follow all hot work procedures and properly use appropriate PPE.
- Inspect all hot work equipment before use and report any equipment problems or unsafe conditions.

Procedure

General

ANC Foster must ensure that exposure of persons to atmospheric contaminants arising from welding, including fumes, gases and vapors emitted from materials consumed during welding and from materials being welded, is controlled by use of one or more of the following measures (in descending order of priority):

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- Substituting a less hazardous process, material or procedure;
- Using appropriate ventilation.

Before cutting or welding is permitted the area shall be inspected by a ANC Foster supervisor responsible for inspection and granting authorized welding and cutting operations.

Ducts, conveyor systems, and augers that might carry sparks to distant combustibles shall be protected or shut down.

Where cutting or welding is done near walls, partitions, ceilings, or openings in the floor (grating, manholes, etc.), fire-resistant shields or guards shall be provided to prevent ignition.

If welding is to be done on a metal wall, partition, ceiling, or solid decking/flooring, precautions shall be taken to prevent ignition of combustibles on the other side, due to conduction or radiation of heat. Where combustibles cannot be relocated on the opposite side of the work, a fire watch person shall be provided on the opposite side of the work.

Welding shall not be attempted on a metal partition, wall, and ceiling or decking/flooring constructed of combustible sandwich panels.

Cutting or welding on pipes or other metal in contact with combustible walls, partitions, floors, ceilings, or roofs shall not be undertaken if the work is close enough to cause ignition by combustion.

Cutting or welding shall not be permitted in the following situations:

- In areas not authorized by management.
- In sprinkled buildings while such protection is impaired.
- In the presence of potentially explosive atmospheres, e.g. flammables.
- In areas near the storage of large quantities of exposed, readily ignitable materials.
- All dust accumulation shall be cleaned up before welding or hot work is permitted.

Signage


ANC Foster will ensure that adequate signs to warn of the hazards are provided at or near any area in which there is a risk of exposure of persons to hazards arising from welding.

Fumes, Gases and Dust

Fumes produced by some welding processes can be toxic and may require source extraction. An assessment of the work to be performed must be completed before each job is undertaken. Fumes generally contain particles from the material being welded. Welding fumes can have an acute effect on the respiratory system.

Any welding, cutting or burning of lead base metals, zinc, cadmium, mercury, beryllium or exotic metals or paints that could produce dangerous fumes shall have proper ventilation or respiratory protection.

All welding and cutting operations shall be adequately ventilated to prevent the accumulation of toxic materials. This applies not only to the welder, but also to helpers and other personnel in the immediate vicinity.

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Personal Protection

Any person who may be exposed to atmospheric contaminants arising from welding, including fumes, vapors or gases emitted from materials consumed during welding and from materials being welded, is provided with suitable respiratory protection by ANC Foster if the person may be exposed to atmospheric contaminants exceeding the appropriate exposure standard referred to in clause 51 of the OHS Regulation (Atmospheric contaminants—particular risk control measures).

Helmets and hand shields shall be made of a material, which is an insulator for heat and electricity. Helmets, shields, and goggles shall not be readily flammable and shall be capable of withstanding sterilization.

Helmets and hand shields shall be arranged to protect the face, neck and ears from direct radiant energy from the arc.

Helmets shall be provided with filter plates and cover plates designed for easy removal.

All parts shall be constructed of a material, which will not readily corrode or discolor the skin.

Goggles shall be ventilated to prevent fogging of the lenses as much as practicable.

All glass for lenses shall be tempered, substantially free from scratches, air bubbles, waves and other flaws. Except when a lens is ground to provide proper optical vision correction, the front and rear surfaces of lenses and windows shall be smooth and parallel.

Lenses shall bear some permanent distinctive marking which may readily identify the source and shade.

Adequate hand protection and clothing must be used to protect the body from welding hazards.

Ultraviolet Radiation Protection


ANC Foster shall ensure that risks associated with exposure of persons to harmful levels of ultraviolet radiation at or near the site of welding are controlled by use of the following measures (in descending order of priority):

- Using appropriate screens to provide protection from ultraviolet radiation;
- Ensuring that persons required to be in an area in which there is a risk of exposure to ultraviolet radiation are wearing appropriate protective equipment; and
- Ensuring that persons who are not carrying out welding are not permitted to enter an area in which there is a risk of exposure to ultraviolet radiation and that adequate signs to warn of the hazards are provided.

Cleaning Compounds

In the use of cleaning materials, because of their possible toxicity or flammability, appropriate precautions such as manufacturer instructions shall be followed.

- Degreasing and other cleaning operations involving chlorinated hydrocarbons shall be so located that no vapors from these operations will reach or be drawn into the atmosphere surrounding any welding operation.
- In addition, trichloroethylene and perchloroethylene shall be kept out of atmospheres penetrated by the ultraviolet radiation of gas-shielded welding operations.

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Oxygen cutting, using a chemical flux, iron powder or gas shielded arc cutting for stainless steel shall be performed using mechanical ventilation adequate to remove the fumes generated.

Cylinders

All cylinders shall be kept away from sources of heat and from radiators and piping systems that may be used for grounding purposes. Cylinders and cylinder valves including couplings and regulators shall be kept free from oily or greasy substances and must not be handled with gloves or rags in the same condition.

Cylinders shall not be kept in unventilated enclosures such as lockers and cupboards.

All acetylene cylinders shall be stored valve-end up.

Assigned storage spaces shall be located where cylinders cannot be knocked over or damaged by falling objects or subject to tampering by unauthorized persons.

- Back flow protection shall be provided by an approved device that will prevent oxygen from flowing into the fuel-gas system or fuel from flowing into the oxygen system.
- An approved device that will prevent flame from passing into the fuel-gas system shall provide flashback protection.
- An approved pressure-relief device set at the appropriate pressure shall provide backpressure protection.

Special care must be taken when transporting gas cylinders:

- Cylinders must be secured with valve cap installed.
- Cylinders shall not be lifted by the valve protection caps, the regulators must be removed and cylinders shall not be dropped or permitted to strike each other.
- Removed regulators must be carried in the cab of the vehicle.
- Cylinders shall not be tampered with nor should any attempt be made to repair them.
- They shall be handled carefully - rough handling, knocks, or falls are liable to damage the cylinder, valve or safety device and cause leakage.

Safety devices shall not be tampered with.


Arc Welding and Cutting

All personnel operating, installing, and maintaining welding equipment shall be qualified or trained to operate and maintain such equipment.

All ground connections shall be checked to determine that they are mechanically strong and electrically adequate for the required current.

A disconnecting switch or controller shall be provided at or near each welding machine along with over current protection.

If the object to be welded or cut cannot readily be moved, all moveable fire hazards should be removed.

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If an object to be welded or cut cannot be moved and if 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.

Resistance Welding

All personnel operating, installing, and maintaining welding equipment shall be qualified or trained to operate and maintain such equipment.

- Voltage, interlocks, guarding, grounding and shields shall be in accordance with manufacturer recommendations.
- Precautions such as flash guarding, ventilation and shields shall be provided to control flashes, toxic elements and metal fumes.

If the object to be welded or cut cannot readily be moved, all moveable fire hazards should be removed.

Transmission Pipeline

When arc welding is performed in wet conditions, or under conditions of high humidity, special protection against electric shock shall be supplied.

Pressure testing:

- In pressure testing of pipelines, the workers and the public shall be protected against injury by the blowing out of closures or other pressure restraining devices.
- Protection shall be provided against expulsion of loose dirt that may have become trapped in the pipe.

Oxygen Fuel Gas Welding and Cutting:

Only approved apparatuses such as torches, regulators or pressure-reducing valves, setting generators and manifolds shall be used:

- Mixtures of fuel gases and air or oxygen may be explosive and must be guarded against.
- Workers in charge of the oxygen or fuel-gas supply equipment, including generators, shall be instructed and judged competent by the ANC Foster before being left in charge.

If the object to be welded or cut cannot readily be moved, all moveable fire hazards should be removed.

First Aid Equipment

First aid equipment shall be available at all times. All injuries shall be reported as soon as possible for medical attention. First aid shall be rendered until medical attention can be provided.

Training

Cutters, welders and their supervisors must be suitably trained in the safe operations of their equipment and the safe use of the process.