Westwood MECHANICAL INC.

**#9-Cutting Torch –Safe Job Procedure (Final Oct../04)**

## 1. PURPOSE:

The purpose of this procedure is to explain the step –by-step instructions in the use of a cutting torch.

## 2. GENERAL:

**During the cutting of metals, certain specific hazards are present that could affect the safety and health of employees. Fumes from oxygen-acetylene, oxygen-propane cutting pose an inhalation problem.** The following procedures and personal protective equipment are mandatory for all employees when cutting.

## 3. SCOPE AND DEFINITION:

It is recognized that no set of safe job procedures can cover all possible exposures where personal protective equipment may be needed.

Only employees with the proper training and /or supervision shall attempt this procedure.

**Only cutting of materials may be done once it has been confirmed that it will not produce additional hazards such as toxic fumes etc.**

## 4. PROCEDURE:

### 4.1 Safe Handling of Cylinders:

**Cylinders must be stored in dry, well-ventilated areas where they are not likely struck or knocked over. They should be secured "upright" by some substantial (chain, cable, etc.) means so they will not fall. They should never be stored near stairways, gangways or elevators. Keep sources of ignition at least 20 feet away from storage area. Store oxygen and fuel gas cylinders separately (at least 20 feet apart or by a fire-resistance barrier of at least 1 hour rating and at least 5 feet high) and do not store oxygen with reserve stocks of combustible materials. It is very important not to store oxygen cylinders in the same area as oil, grease or other petroleum products. CONTACT BETWEEN OXYGEN AND ANY PETROLEUM PRODUCTS CAN RESULT IN FIRE AND EXPLOSION.**

**Always attach the valve protection cap (hand tight) when the cylinder is not being used, The cap is designed to protect the valve from damage, which could cause the sudden release of the contents of the cylinder.**

### 4.2 Valve Examination and Regulators:

**Use the proper wrench when attaching the regulator to the cylinder. Do not use a pipe wrench or a pair of pliers.**

**If the valve is equipped with a hand wheel do not attempt to open or close it with a hammer.**

**Watch the needle of the regulator after the torch valves have been closed. If it begins to creep upward replace the regulator immediately. Do not try to repair regulator or torches. A qualified person should do repair work.**

### 4.3 Connections and Hoses:

**Replace hoses, which have leaks, burns, or worn places.** Cut out the damaged section and splice the two cuts together, do not attempt to repair hoses with tape. You should test for leaks by submerging the hose in water and looking for bubbles. Leaks in connections and hoses can also be detected by painting on a leak test solution of soapy water and checking for bubbles. **Never test for a leak by using a flame.**

Use only approved bronze or brass fittings. When making up connections do not use white lead, grease, pipefitting compounds or other petroleum products.

Make sure that the hoses are not placed where they can be walked on, driven over, cut or otherwise damaged. Do not expose them to heat, sparks, oil or grease.

### 4.4 Colour Code the Hoses:

All gas hoses used in the operation should conform to the following Colour code schedule:

**GREEN-----OXYGEN**
**RED---------ACETYLENE/FUEL GAS (PROPANE)**
**BLACK------AIR/INERT GAS**

### 4.5 Before Beginning Cutting Operations:

Clear the area of any flammable materials for a space of 20 feet or cover them with fire resistant shields.

**Cover the cracks and openings in floors to prevent sparks from falling through to the lower floors. If it is not possible to do this, check the lower floor and make sure there are no combustibles that could be exposed to sparks.**

**When possible move the work to be cut to a safer location.**

Cover wooden floors with fire resistant materials.

Shut down ventilation and close ducts if there is a chance they could transmit sparks to other areas.

Maintain a "fire watch" during the work and for ½ hour after the work is completed.

**Provide approved fire extinguishers in the area. Fire extinguishing equipment for any type of fire that may be encountered, must be present, i.e. Type A for normal combustible materials like wood, paper etc. and type B for oils, paint thinners etc.**

### 4.6 Cutting Operation:

- **Secure the pipe or item to be worked on.**
- Visually check for congestion, combustibles and other conditions that could impair the safety of the operation.

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- Ensure that bottles are secure.
- If required adjust the flexible exhaust pick-up opening 4-6 inches from cutting area.
- Insure that while cutting, the exhaust opening follows at that distance.
- Open the valves.
- Turn on the acetylene –1/4 turn at torch handle.
- **Light with striker, never use lighters, matches or cigarettes.**
- Increase the acetylene until the black smoke decreases.
- Turn the oxygen on at the torch handle.
- Increase the oxygen until the desired flame is achieved (blue short tip with no feathers.)
- **If torch backfires, try re-lighting. If there is another flashback, stop using the torch and have it inspected.**
- Cut as required.
- **During cutting, keep hands and arms out of the scrap fall area and be alert for sparks during the operation.**
- **Make sure area where cut piece is to fall is barricaded and clear of any personnel.**
- After making the cut, turn off torch valves and fuel/oxygen supply. Mark all hot materials with the work: "HOT" if other employees are working close to this operation.
- Make sure work area is clean and ready for next operation after completing work or at the end of the shift.

## 5. EQUIPMENT/MATERIAL REQUIRED

Personal protective equipment is required to protect the worker eyes from radiation and to protect the worker from hot slag.

**Welder's goggles or cutting glasses must be worn to protect the eyes from radiation and sparks.**

**If cutting galvanized materials, or lead painted steel, worker must wear respiratory protective equipment with approved filter to protect against toxic fumes. When cutting other materials workers should ensure that there is proper ventilation to prevent a lack of oxygen.**

**Woolen clothing gives better protection than cotton because it is less flammable. If cotton clothing is worn it should be treated chemically to reduce flammability. Clothing should be free of grease and oil and other substances, which may burn. Do not wear clothing with cuffs or pockets where sparks could lodge. Flameproof gauntlet gloves, a leather asbestos apron and high top safety shoes provide good protection against sparks and hot slag.**

Worker shall always wear his hard hat.

A metal rack or acceptable means is required for securing the bottles upright and stationary.

Require the approved oxygen and acetylene bottles with the appropriate gauges, back check valves and hoses.

## 6. SPECIAL CONSIDERATIONS

It is essential that you take care of your personal protective equipment. Eye protection must be kept clean to be sure that you have good vision at all times.

**Be cautious of being caught in or between and struck by accidents caused when handling moving materials to be cut or when removing materials after the cutting operation is performed.**

Be cautious of a fire or possible explosion damage to materials and equipment because of faulty torch, gas fuel leaks or improper operation of the torch.

Make sure all hoses and torch body connections are tight and not cross-threaded. Remember that gas hose connections have left – handed threads. Never interchange oxygen with gas hose.

Be alert for leaks when opening natural gas valves. If a strong odour is present shut the system off and check out the problem.

Never place your fingers into an area that could result in a crush injury because of something being dropped or moved.