



# **POLICY & PROCEDURES**

**(Standard Operating Procedures)**

## **SAFETY DEPARTMENT**

Reference No. SOP/SBGOM/2017/V/1



## **TABLE OF CONTENTS**

<b>S.N</b>	<b>Description</b>	<b>Page No.</b>
1	Policy	01
2	Fundamental Requirements	01
3	Travel Distance To Emergency Escape Routes	02
4	Protection of Employees & Visitors during the Repair Activities	02
5	Protection of Employees & Visitors during the Maintenance Activities	02
6	Fire Fighting	02
7	Fire Safety	03
8	Fire Prevention	12
9	Emergency Action Plan	17
10	Medical Assistance	17
11	Housekeeping	17
12	Electrical Safety	18
13	Work At Height Safety	19
14	Working Safely In Confined Spaces	23
15	Industrial Hygiene	24
16	Control Of Hazardous Energy	25
17	PPE's-Personal Protective Equipment's	26
18	Scaffolds Safety	27
19	Hand and Power Tools	29
20	Welding and Cutting	30
21	Hot Work Procedures	35
22	Cold Work Procedures	37
23	High Risk Operations EHS Procedures	42
24	Confined Space Safety Procedures	43
25	Hazard Communication	53
26	First Aid	61
27	Stairways & Ladders	62
28	Compressed Gas Cylinder Safety	65
29	Safety Committee	68
30	MSDS Use & Training	70

**POLICY:**

SBG O & M believes in developing safe working procedures and maintaining a 0 injury working environment.

Following process will be adopted for the development and implementation of safe working procedures and practices:-

- Identification of work activities in all the mall area/departments
- Identification of hazards involved in performing activities
- Identification of available controls to eliminate or diminish the risk
- Implementation of control measures
- Regular inspections by safety teams to ensure implementation of control measures
- Review of the activities for identification of new activities or change in the nature of such jobs.
- The course of action of the team will be to match the job activities with the written procedures
- To identify the non-compliance through the safety internal audit team.
- After identifying non-compliance the team will put the matter in safety committee meeting.
- The safety committee will ensure the compliance by the non-complying department.

**STATEMENT:**

- Standard operating procedures (SOP's) have been developed by the SBG O & M team for work or use of equipment that has potential to cause critical injury and/or occupational illness inside the Jabal-e-Omar Development project.
- Standard operating procedures (SOP's) will be implemented as necessary to meet operational needs and objectives.

**FUNDAMENTAL REQUIREMENTS:**

- Building Structure mall shall not cause danger to occupants of commercial area during period necessary for escape.
- There shall be no locks or devices to prevent emergency egress except in specialized facilities areas.
- Means of egress shall be clearly visible and understandable to occupants of commercial area who are physically and mentally capable to know the direction of escape.
- Any doorway or passageway not constituting an exit or way to reach an exit, but of such a character that it may be mistaken for an exit, shall be clearly marked "Not an Exit."
- When fire may not itself provide adequate warning to occupants, fire alarm facilities shall be provided where necessary to warn occupants of commercial area about the existence of fire.
- Provisions for emergency egress shall not cause hazard under normal occupancy conditions.

**TRAVEL DISTANCE TO EMERGENCY ESCAPE ROUTES:**

Distance to exits shall be measured from the most remote point subject to occupancy.

Travel distance to at least one exit shall not exceed 200 ft. (60 m) in building inside the commercial area.

**PROTECTION OF EMPLOYEES & VISITORS DURING THE REPAIR ACTIVITIES:**

When construction or repair activity is in progress, for whatever purpose, the employees & visitors shall be protected to the same extent as if construction or repair were complete.

The activity shall not create any additional danger beyond the normally permissible conditions of the building. When these requirements cannot be met, that specific or affected portion thereof shall not be occupied.

**PROTECTION OF EMPLOYEES & VISITORS DURING THE MAINTENANCE ACTIVITIES:**

Every required exit, way of approach thereto, and way of travel from the exit into the corridor or open space shall be continuously maintained free of all obstructions to full instant use in the case of fire or other emergency.

Every automatic sprinkler system, fire detection and alarm system, exit lighting, fire door, and other item or equipment, where provided, shall be continuously in proper operating condition.

**FIRE FIGHTING- OPERATING PROCEDURES:****SPRINKLER SYSTEMS:**

Sprinkler systems provide early fire control or extinguishment, helping to mitigate the hazards for occupants and fire-fighters alike. Building codes, fire codes, and life safety codes specify when to provide sprinkler systems. These may be either locally written codes or adopted model codes such as the IBC, the IFC, NFPA 1, NFPA 101, or NFPA 5000. In addition, various sections of the OSHA standards require the installation of sprinkler systems.

A widely accepted installation standard for commercial system design is NFPA 13, Standard for the Installation of Sprinkler Systems. Other standards include: NFPA 13D, Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Mobile Homes; and NFPA 13R, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height. Designers may also refer to NFPA 13E, Recommended Practice for Fire Department Operations in Properties Protected by Sprinkler and Standpipe Systems, although any given fire service organization may follow different standard operating procedures.

**ZONING:**

It is important for sprinkler designers and fire alarm designers to work together, especially in unusual buildings. The fire alarm system will often have an annunciator to indicate the location of the alarm to the fire department. Sprinkler piping arrangement will limit options for fire alarm annunciation of water flow signals. Coordination is essential to furnish the fire service with clear information on the fire or its location. Alarm signals are reported in terms of their floor level to enable the fire department to respond to the correct floor during an emergency. Consider the situation of a building with two levels adjacent to a single



level “high-bay” area. The first floor sprinkler zone should include both the high bay area and the lower level of the two-level section because each of these areas shares the same floor. Meanwhile, the upper level of the two-story section should have its own zone, even if the piping it contains is on the same level as the high bay area.

NFPA 13 requires that sprinkler controls remain independent of standpipe systems. Typically, all sprinklers would be located downstream from a control valve that will not shut off any fire hose connections. This enables the fire department to shut off the sprinklers during the rare occasions when a sprinkler pipe fails, or the sprinklers are not controlling the fire. In this manner, hose connections remain available for manual fire suppression without losing pressure from the broken pipe, or the excessive number of activated sprinklers.

In some situations, when a building does not include a standpipe system, NFPA 13 allows fire hose connections to be fed from sprinkler systems. In these cases, closing the sprinkler system valve would shut off the fire hose connections.

In some cases, sprinkler systems are fed from two different standpipes or feed mains, in a “dual feed” arrangement. Although this provides a hydraulic design advantage, NFPA 13 recommends against it to avoid confusion. If a designer chooses this arrangement (and the code official permits it), cross-reference signs should be provided at each valve. Each of these signs would indicate the location of the companion valve that feeds the same system. No single sprinkler system should be fed from three or more points, since the flow from a single sprinkler may not activate any of the flow switches.

#### **WATER SUPPLY CONTROL VALVES:**

Fire service personnel often need rapid access to valves. If a valve is closed during an incident, it may need to be opened to permit flow of water. If a sprinkler valve is open, it may need to be closed to assist in manual suppression efforts.

NFPA 13 requires marking for all water supply control valves including main valves, pump valves, sectional valves, and zone valves. The wording “control valve” by itself does not tell a user the specific use of the valve or what portion of the system is downstream of a particular valve.

If valve identification is not obvious, an additional diagram should be provided. A diagram of zones and the boundaries between them should be mounted adjacent to each valve. This will enable fire-fighters to quickly determine which valve controls each specific area.

NFPA 13 requires valves to be accessible for operation. If valves are located in stairs, they will be protected and easily accessible during a fire event. When a water supply control valve must be located in a room or in a concealed space, a sign outside the door or access panel helps fire-fighters to quickly locate it. If the concealed space is above a suspended ceiling, the appropriate place for the sign is on the fixed ceiling grid, rather than on a removable ceiling tile.



Valve handles are often located high enough to be out of vandals' easy reach. However, such placement requires a ladder to reach them when necessary. Although some jurisdictions may require that valves be low enough to reach without a ladder, all minimum height requirements for obstructions must be followed.

Valves for testing and draining purposes should also be labelled. This will prevent any potential confusion.

Exterior valves should be placed in locations accessible even during a fire incident. Wall-mounted valves should be positioned no higher than 5 feet above grade (ground level) and located at least 40 feet from openings such as windows, doors, or vents. Post indicator valves should be at least 40 feet from the buildings they serve. The 40 foot distance is called for in NFPA 24.

#### **FIRE PUMPS:**

Fire pumps are used to boost the water pressure in sprinkler and standpipe systems and to deliver the required amount of water. This is necessary when the system is fed by a non-pressurized water tank, or when the water supply feeding the system has inadequate pressure. A fire pump may be driven by an electric motor, diesel engine, or steam turbine.

NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, contains design and installation details for fire pump installations. NFPA 20 requires electrical monitoring of pump controllers for pump running, power failure, or controller trouble. These remote alarm signals are often incorporated into fire alarm annunciators, so that fire departments may identify the status of a given fire pump.

A fire pump controller is the enclosure that contains controls and status indicators for a fire pump. NFPA 20 requires these devices to be within sight of the fire pump motor or engine. The automatic transfer switch, which is often in a separate enclosure, transfers power to a secondary power source (when provided). Fire service personnel may need access to this equipment during the course of a fire.

NFPA 20 contains reliability requirements for the power supply to an electrically driven fire pump. For example, power supply lines must be protected and the circuit must be independent of a building's electric service. The latter feature allows the fire service to shut down building power while the fire pump continues to run. 29 CFR Subpart S must also be followed.

The most desirable location for a fire pump is in a separate building. This affords the most protection from fire, and gives fire-fighters easy access to the pump and its controllers. If locating the pump in a separate building is not possible, a fire-rated room with an outside entrance is the next best option. NFPA 20 requires pump rooms to be separated from the rest of the building by 2-hour fire rated construction in buildings without full sprinkler protection, and 1-hour construction in fully sprinkle red buildings.

Inside and outside entrances to fire pump rooms should be labelled with signage. Minimum lettering size should be six inches high with a 1/2 inch stroke (thickness of lines in each letter).



## **STANDPIPE SYSTEMS:**

### **GENERAL:**

Standpipe systems consist of a fixed piping system and hose valve connections to preclude the need for long hose lays within tall or large buildings. Water is fed into these systems either through an automatic water supply or manually through a fire department connection. The system delivers water to hose connections throughout the building, usually in enclosed or exterior stairs. Fire-fighters then extend hose lines from these hose connections to conduct interior fire suppression operations. Standpipes are, in effect, a critical component in the supply of water to interior fire fighting crews.

Building and fire codes specify when designers should incorporate standpipe systems. This can be a locally written code or an adopted model code such as the IBC, the IFC, NFPA 5000, or NFPA 101. Standpipe systems requirements are based on building height or interior travel distances. In addition, standards such as those issued by OSHA require standpipe systems in certain situations.

### **FIRE HOSE CONNECTIONS:**

Hose connections in Class I systems are typically 2 1/2 inch threaded outlets. It is essential that hose connection type and size match that used by the fire department in the jurisdiction where the building is located.

The primary location for hose connections is within enclosed, fire-resistance rated stairs. Fire-fighters set up and begin their attack from within the protected stair enclosure. Then the attack may proceed towards the fire location. If a quick evacuation becomes necessary, the hose then functions as a lifeline, leading the fire-fighters back to the protection of the stairs.



*Hose connection on intermediate landing as viewed from the main landing where the stair entry door is located.*

### **DESIGN PRESSURE:**

Most new standpipe systems are designed by hydraulic calculations. This ensures that the water supply, pipe sizes used, and pumps (if needed) will provide a certain flow and pressure at a specified number of hose connections in the system. The current NFPA 14 specifies a minimum design pressure for Class I systems of 100 pounds per square inch (psi) at a specific flow rate, which depends on the number of hose connections per floor. However, it includes an exception that allows design pressures as low as 65 psi, if this will accommodate the fire suppression tactics.

A straight stream nozzle requires at least 50 psi to operate. With the friction loss in fire hose added, 65 psi at the hose connection will provide 50 psi to a straight stream nozzle with 250 gallons per minute (gpm) flowing through 100 feet of 2 1/2 inch fire hose. The same pressures can deliver 95 gpm through 100 feet of 1 3/4 inch hose.





In all cases where lower pressure is not specifically approved by the fire department, 100 psi basic pressure should be considered the minimum.

NFPA 14 imposes a maximum pressure limit of 175 psi on standpipe systems for fire department use. Pressures in excess of 175 psi will invoke requirements for pressure reducing devices

**PRESSURE REGULATING DEVICES:**

Pressure regulating devices (PRDs) restrict system pressures, usually below 175 psi for Class I systems. This is considered the maximum safe operating pressure as well as the maximum working pressure limit of most fire protection components. Proper design of PRDs is imperative so that fire-fighters have adequate pressure for hose streams.

**STANDPIPE ISOLATION VALVES:**

The vertical pipes that feed hose connections are called standpipes or risers. If there are multiple risers, NFPA 14 requires interconnections with supply piping to form a single system, with valves at the point where each riser is fed by the main bulk piping coming from the water supply point.

These valves are all called “standpipe isolation valves.” The ones on vertical risers are called “riser isolation valves.” They allow the fire department to shut off, or isolate any given riser or feed that breaks or otherwise fails. Fire-fighters may then use the remaining standpipes.

NFPA 14 requires that riser isolation valves separately control the feed to each standpipe. Sequential valves in the bulk main can shut off more than one downstream riser. For risers in stairways, the riser isolation valve is located in the stair enclosure to protect fire-fighters who may need to operate them.

**FIRE DEPARTMENT CONNECTIONS:****GENERAL:**

A fire department connection (FDC) includes one or more fire hose inlet connections on a sprinkler system, standpipe system, or other water-based suppression system. The hose inlet connections enable the fire department or fire brigade to hook up hose lines from one or more pumpers and feed water into the system to supplement the connected automatic water supply. In manual dry standpipe systems, FDCs are the only water supply.



**QUANTITY:**

Standards generally require a single FDC. In some cases, an additional interconnected FDC will be required. For example, NFPA 14 requires multiple FDCs in remote locations on high-rise buildings. This code provision was added after experience with high-rise fires showed that broken glass and debris falling from a fire area can damage hose lines. A second remote FDC increases the dependability of the water supply.

When a building has multiple FDCs, most fire departments would prefer that they be interconnected. This enables the fire department to feed any system from any FDC. However, sometimes this is not possible. For example, a manual dry standpipe system (with no connected water supply) cannot be interconnected with an automatic sprinkler system. Sometimes, FDC interconnection is not preferable.

**INLETS:**

Most standards do not specify the number of inlets required on each FDC. NFPA 13 does say that a single inlet is acceptable for FDCs feeding pipe that is 3 inches or smaller. However, no requirements are identified beyond that. Many FDCs have dual inlets; these are often referred to as “Siamese” connections.

One rule of thumb is to provide one inlet for each 250 gallons per minute (gpm) of system demand, rounded up to the next highest increment of 250 gpm. For example, if the system demand is 700 gpm, the designer would specify three inlets. Likewise, a system with a demand of 800 gpm would need four inlets.

**FIRE ALARM AND COMMUNICATION SYSTEMS:****GENERAL:**

A fire alarm system consists of interconnected devices and controls to alert building occupants to fire or dangerous conditions and provide emergency responders with information on those conditions. Clear and concise information will enable responders to operate efficiently and safely.

Fire alarm systems monitor alarm-initiating devices such as manual pull stations, automatic detectors, or water flow indicators. If a signal is received, the control components process it via software programs or relays. The system then activates audible and visual evacuation notification devices, sends a remote signal to the fire service or other authorities; displays the location of the alarm; recalls elevators; and controls ventilation systems.

Building and fire codes often specify requirements for fire alarms systems. Commonly used codes include the IBC, NFPA 5000, and NFPA 101. The National Fire Alarm Code, NFPA 72, is a comprehensive installation standard. This code, along with the fire alarm wiring portion of the National Electric Code, NFPA 70, sets the requirements for design, installation, and maintenance. In addition, OSHA standards create obligations with respect to employee alarm systems. This chapter covers fire service personnel interaction with fire alarm systems and provides guidance for designers to facilitate operational efficiency.

**ZONING AND ANNUNCIATION:**

An annunciator panel displays information about the location and type of alarm. This assists the fire service with their initial response and may help track the spread of smoke or heat. A building may have multiple annunciators to serve multiple entrances. Or, there may be different annunciators for different users, such as the fire department, the security force, and building management staff.

Typically, the best location is at the main entrance where the fire department plans to initially respond.

Each building should have its own annunciator, even if a single fire alarm control system serves multiple buildings. Fire service operations would be delayed if it were necessary for one unit to report to a given building to check the annunciator, then relocate (or direct another unit) to investigate origination of the alarm. In large complexes, an additional master annunciator could assist the fire service in locating the building where an alarm originates.

Annunciators display alarm information in different ways. Some have lights or LEDs that are labelled alphanumeric annunciators have a readout-type display that may be programmed to show very specific information describing the alarm signal. A printer is yet another means of annunciation. It is usually used in conjunction with other devices.

Smoke and heat detectors should be further identified on the annunciator by mounting location:

- Area (ceiling)
- Under floor
- Duct
- Air plenum
- Elevator lobby
- Elevator machine room
- Elevator hoist way
- Stair shaft

They signal a need for non-emergency action, such as repair, and they should not cause an Evacuation alarm or notify the fire department.

Examples of Supervisory Devices:

- Valve tamper switch (closed or partially closed water supply control valve)
- Dry sprinkler high or low air pressure switch
- Pre-action sprinkler low air pressure switch
- Water tank low temperature or low water level indicator
- Valve room low air temperature indicator

Status indicators give information about whether the main fire alarm power is on, or they report on the condition of devices external to the alarm system.

Examples of Status Indicators:

- Main system power on
- Main system trouble
- Fire pump running



- Fire pump fault,
- Fire pump phase reversal
- Generator run
- Generator fault
- Stair doors unlocked
- Smoke control system in operation

Controls are switches that control features external to the fire alarm system.

Examples of Control Switches:

- Remote fire pump start
- Remote generator start
- Smoke control manual switches
- Stair unlocking switches

#### **FIRE DEPARTMENT NOTIFICATION:**

Building or fire codes often require fire alarm systems to automatically alert the responsible fire brigade, fire department, or other emergency response forces. The important consideration for fire department response is reporting the correct location. Often an alarm service or off-site location will receive the alarm signal and then retransmit it to the fire department and/or fire brigade.

It is crucial that the address reported to the fire department match the address where the alarm originated. If a building has multiple addresses, the one with the fire alarm annunciator or fire command centre, should be reported. If a building includes separate, independent annunciators, coordinate the remote signal with the correct annunciator location.

#### **CONSIDERATIONS - FIRE DEPARTMENT NOTIFICATION:**

- Report the correct location/address.
- Report the entrance with the alarm annunciator or fire command centre.
- Report the section or wing of the building.
- Report device type, if possible.

#### **VOICE ALARM SYSTEMS:**

Voice alarms automatically send a voice evacuation message to speakers in selected areas of high-rises buildings, where total evacuation is impractical. A typical high-rise arrangement would provide for the following areas to automatically receive a pre-recorded evacuation signal: the floor where the alarm originates and the floors above and below it. Arriving fire-fighters can evacuate additional areas by manually activating one, multiple, or all floors with the manual select switches in the command centre. They also can override the pre-recorded message and broadcast live voice announcements to any or all evacuation zones with a microphone at the command centre.

**FIRE DEPARTMENT COMMUNICATIONS SYSTEMS:**

Fire department communications systems are two ways telephone systems typically required in high-rise buildings. The command centre contains the control unit with the main handset for use by the fire department commanders. Either handsets or jacks for handsets are then placed in areas of the building for fire-fighters to communicate with the command centre. If the system uses jacks, a number of portable handsets with plugs are provided in the command centre for distribution to fire-fighters.

**FIRE COMMAND CENTERS:**

Building or fire codes typically require high-rise buildings to have a dedicated room or other location containing fire alarm and related fire protection control equipment. These are called "Fire Command Centres" in NFPA 72 and in the IBC. The term "Central Control Station" is used in NFPA 101 and NFPA 5000. Yet another term, "Emergency Command Centre," is used in NFPA 1. Industry also uses the expression "Fire Control Room."

**FIRE SAFETY-STANDARD OPERATING PROCEDURES:****HOW FIRE STARTS?**

Fire is a chemical reaction involving rapid oxidation or burning of a fuel. It needs three elements to occur.



**FUEL** - Fuel can be any combustible material - solid, liquid or gas. Most solids and liquids Become a Vapour or gas before they will burn.



**OXYGEN** - The air we breathe is about 21 per cent oxygen. Fire only needs an atmosphere With at least 6 per cent oxygen.



**HEAT** - Heat is the energy necessary to increase the temperature of the fuel to a point where Sufficient Vapours are given off for ignition to occur.



**CHEMICAL REACTION** - A chain reaction can occur when the three elements of fire are present in the proper conditions and proportions. Fire occurs when this rapid oxidation or burning takes place.



Take any one of these factors away, and the fire cannot occur or will be extinguished if it was Already burning.

### HOW FIRES ARE CLASSIFIED?



#### **CLASS A**

Ordinary combustibles or fibrous material, such as wood, paper, cloth, rubber and some plastics.



#### **CLASS B**

Flammable or combustible liquids such as gasoline, kerosene, paint, paint thinners and propane.



#### **CLASS C**

Energized electrical equipment, such as appliances, switches, panel boxes and power tools.



#### **CLASS D**

Certain combustible metals, such as magnesium, titanium, potassium and sodium. These metals burn at high temperatures and give off sufficient oxygen to support combustion. They may react violently with water or other chemicals, and must be handled with care.



## FIRE PREVENTION:



### **Class A — Ordinary combustibles:**

Keep storage and working areas free of trash Place oily rags in covered containers.



### **Class B — Flammable liquids or gases:**

Don't refuel gasoline-powered equipment in a confined space, especially in the presence of an open flame such as a furnace or water heater.

Don't refuel gasoline-powered equipment while it's hot.

Keep flammable liquids stored in tightly closed, self-closing, spill-proof containers. Pour from storage drums only what you'll need.

Store flammable liquids away from spark-producing sources.

Use flammable liquids only in well-ventilated areas.



### **Class C — Electrical equipment:**

Look for old wiring, worn insulation and broken electrical fittings. Report any hazardous condition to your supervisor.

Prevent motors from overheating by keeping them clean and in good working order. A spark from a rough-running motor can ignite the oil and dust in it.

Don't misuse fuses. Never install a fuse rated higher than specified for the circuit.

Investigate any appliance or electrical equipment that smells strange. Unusual odours can be the first sign of fire.

Don't overload wall outlets. Two outlets should have no more than two plugs.



### **Class D — Flammable metals:**

Flammable metals such as magnesium and titanium generally take a very hot heat source to ignite; however, once ignited are difficult to extinguish as the burring reaction produces sufficient oxygen to support combustion, even under water.

In some cases, covering the burning metal with sand can help contain the heat and sparks from the reaction. Class D extinguishing agents are available (generally as a dry powder in a bucket or box) which can be quite effective, but these agents are rare on the campus.

Pure metals such as potassium and sodium react violently (even explosively) with water and some other chemicals, and must be handled with care. Generally these metals are stored in sealed containers in a non-reactive liquid to prevent decay (surface oxidation) from contact with moisture in the air.

**WHEN NOT TO FIGHT A FIRE:**

Never fight a fire:

- If the fire is spreading beyond the spot where it started
- If you can't fight the fire with your back to an escape exit
- If the fire can block your only escape
- If you don't have adequate fire-fighting equipment

**DON'T FIGHT THE FIRE YOURSELF  
CALL FOR HELP:****HOW TO EXTINGUISH  
SMALL FIRES?**

**Class A** - Extinguish ordinary combustibles by cooling the material below its ignition temperature and soaking the fibres to prevent re-ignition.

Use pressurized water, foam or multi-purpose (ABC-rated) dry chemical extinguishers. **DO NOT USE** carbon dioxide or ordinary (BC-rated) dry chemical extinguishers on Class A fires.



**Class B** - Extinguish flammable liquids, greases or gases by removing the oxygen, preventing the vapours from reaching the ignition source or inhibiting the chemical chain reaction.

Foam, carbon dioxide, ordinary (BC-rated) dry chemical, multi-purpose dry chemical extinguishers may be used to fight Class B fires.



**Class C** - Extinguish energized electrical equipment by using an extinguishing agent that is not capable of conducting electrical currents.



**Class D** - Extinguish combustible metals such as magnesium, titanium, potassium and sodium with dry powder extinguishing agents specially designated for the material involved.





### **WHAT TO DO IF TRAPPED IN A BURNING BUILDING?**

If you're trying to escape a fire, never open a closed door without feeling it first. Use the back of your hand to prevent burning your palm. If the door is hot, try another exit. If none exists, seal the cracks around the doors and vents with anything available.

If in a dorm room, use wet towels to seal the space under the door and prevent the entry of smoke. Cracks around the door can be sealed with masking tape if necessary.

If trapped, look for a nearby phone and call the fire department, giving them your exact location.

If breathing is difficult, try to ventilate the room, but don't wait for an emergency to discover that window can't be opened.

If on an upper floor and your window is of a type that CANNOT be opened, DON'T break it out- you'll be raining glass down on rescuers and people exiting the building. If you can't contact the fire department by phone, wave for attention at the window. Don't panic.

### **WHAT TO DO IF SOMEONE CATCHES ON FIRE:**

If you should catch on fire:

**STOP - where you are**

**DROP - to the floor**

**ROLL - around on the floor**

This will smother the flames, possibly saving your life.

Just remember to **STOP, DROP and ROLL.**

### **FIRE PROTECTION PROVISIONS:**

Protection – such as automatic sprinklers, and fire retardant points – are required and/or installed, they shall be regularly inspected, maintained, and renewed as necessary to keep them in good operating condition.

**EMERGENCY ACTION PLAN-PROCEDURES:**

The emergency action plan is already in writing & training will also be given to the employees & visitors about that.

The plan includes, at a minimum, the following important elements:

- Escape procedures and escape route assignments
- Critical operations shutdown procedures
- Procedure to account for all personnel
- Rescue and medical duties assignment
- Means of reporting fires and emergencies
- Identification of responsible persons for further information

This emergency action plan addresses all potential emergencies that can be expected in the commercial area.

**MEDICAL ASSISTANCE-PROCEDURES:**

In a major emergency at the project (God Forbid), time is a critical factor in minimizing injuries.

- Nearby Hospital can be used for the treatment of all injured visitors, employees in case of major accident, SBG O & M safety staff are adequately trained to render first aid.
- Where the eyes or body of any employee may be exposed to injurious corrosive materials, eye washes or suitable equipment for quick drenching and flushing must be provided by the project management.
- SBG O & M safety representatives are trained to use any emergency equipment.
- The project management must ensure the ready availability of medical personnel for advice and consultation on matters of employee health. This does not mean that health care must be provided, but rather that, if health problems develop in the workplace, medical help will be available to resolve them.

**HOUSEKEEPING:**

Upon initial assignment, the SBG O & M team shall review those parts of the fire prevention plan which each employee & shops & restaurants tenants must know to protect them in the event of an emergency. The written plan shall be kept in the work place and available to the employee.



## **ELECTRICAL SAFETY-STANDARD OPERATING PROCEDURES:**

Electrical accidents at the project can, for the most part, be avoided if the employees & other sub-contractors will use

- Safe electrical equipment
- And safe work practices.

## **HOW DOES ELECTRICAL ACCIDENTS CAN BE PREVENTED IN THE COMMERCIAL AREA?**

To handle electricity safely, including working with equipment, shops & restaurants tenants & employees need to understand how electricity acts, how it can be approached, the hazards it presents, and how those hazards can be controlled.

Basically, there are two kinds of electricity:

- Static (stationary) Electricity
- Dynamic (moving) Electricity

When anyone activates a switch to turn on an electric machine or tool, it will allow current to flow from the generating source through conductors (usually wires) to the area of demand.

## **HAZARDS OF ELECTRICITY:**

The primary hazards of electricity are:

- Shock
- Burns
- Arc-Blast
- Fires and Explosions
- Falls

## **ELECTRIC SHOCK REASONS:**

You will get a shock if you touch:

- Both wires of an electric circuit
- One wire of an energized circuit and ground
- Part of a machine, which is “Hot” because it is contacting an energized wire and the ground.

Accidents and injuries in working with electricity are caused by one or a combination of the following factors:

- ✓ Unsafe equipment and/or installation
- ✓ Unsafe work practices.

**PREVENTING ELECTRICAL ACCIDENTS:**

Protection from electrical hazards is one way to prevent accidents caused by electric current. Protective methods to control electrical hazards include:

- Insulation
- Electrical protective devices
- Guarding
- Grounding
- PPE's
- Good Work Practices

**WORK AT HEIGHT STANDARD OPERATING PROCEDURES:**

Areas or Activities Where Fall Protection will be needed:

- Hoist areas
- Form work and reinforcing steel
- Leading edge work, unprotected sides and edges
- Roofing works, pre-cast concrete erection
- Construction and other walking/working surfaces

**FALL PROTECTION STANDARD:**

- The rule sets a uniform threshold height of 6 feet (1.8 meters), thereby providing consistent protection.
- The workplace to determine if the walking or working surfaces have the strength and structural integrity to safely support workers.
- Selection of proper fall protection system to protect exposed employees at 6 feet (1.8 m) or more.
- Proper training will be provided related to the work at height safety
- Protection also will be provided for shops & restaurants workers who are exposed to the hazard of falling into dangerous equipment.

**FALL PROTECTION SYSTEMS:**

In case of work at height in the commercial area following fall protection mechanisms will be implemented by the SSCL safety team;

- Guardrail Systems.
- Personal Fall Arrest Systems
- Safety Monitoring Systems
- Safety Net Systems
- Warning Line Systems

**CONTROL OF HAZARDOUS ENERGY-PROCEDURES:**

Serious injuries can be caused to the employees, shops & restaurants tenants, visitors & sub-contractor employees working at Jabal-e-Omar project especially in the commercial centre by the sudden and unexpected start-up of the machinery or equipment, contact with live electrical circuit or the unexpected release of stored energy.

These hazards can be avoided through the use of lockout/tag-out procedures.

**LOCK-OUT:**

The placement of a lockout device on energy – isolating device, in accordance with an established procedure, ensuring that the energy – isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

**TAG-OUT:**

The placement of a tag-out device on an energy-isolating device, in accordance with an established procedure, to indicate that the energy-isolating device and the equipment being controlled may not operate until the tag-out device is removed.

**INDUSTRIAL HYGIENE-PROCEDURES:**

Industrial hygiene is the science of anticipating, recognizing, evaluating, and controlling workplace conditions that may cause worker injury or illness.

By recognizing and applying the principles of industrial hygiene to the project site it will become more healthful and safer environment.

**WORKSITE ANALYSIS:**

A workplace analysis is an essential first step that will help to the SBG O & M Team to determine what jobs and work stations are the source of potential problems. During the worksite analysis, SBG O & M Team will measure and identifies exposures, problem tasks, and risks.

The most-effective worksite analysis will include all jobs, operations, and work activities. If a situation hazardous to health is discovered, the SBG O &M Team will recommend the appropriate corrective actions.

**ENGINEERING CONTROLS:**

It will minimize employee exposure by either reducing or removing the hazard at the source or isolating the worker from the hazard. Engineering controls include eliminating toxic chemicals and substituting non-toxic chemicals, enclosing work processes or confining work operations, and the installation of general and local ventilation systems.

**WORK PRACTICE CONTROLS:**

- Some fundamental and easily implemented work practice controls include changing existing work practices to follow proper procedures that will minimize exposures while operating production and control equipment
- Inspecting and maintaining process and control equipment on a regular basis
- Implementing good housekeeping procedures
- Providing good supervision
- Mandating that eating, drinking, smoking, chewing tobacco or gum in regulated areas be prohibited.

**ADMINISTRATIVE CONTROLS:**

Include controlling employees' exposure by scheduling production and tasks, or both, in ways that will minimize exposure levels. For example, the SBG O & M Team might schedule operations with the highest exposure potential during periods when the fewest visitors/employees are present.

When effective work practices or engineering controls are not feasible or while such controls are being instituted, appropriate personal protective equipment must be used. Examples of personal protective equipment are gloves, safety goggles, helmets, safety shoes, protective clothing, and respirators.

**PROCEDURES FOR WORKING SAFELY IN CONFINED SPACES:**

Any space which has following characteristics will be a confined space:-

- Limited entry and exit
- No or limited passage of fresh air
- Not designed for work

As per OSHA guidelines, characteristics of "Non-permit confined space" & "permit-required confined space" are listed below:-

**Non-permit confined space**

"Means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm"

**Permit-required confined space**

"Means a confined space that has one or more of the following characteristics:-

- Contains or has a potential to contain a hazardous atmosphere
- Contains a material that has the potential for engulfing an entrant
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section or
- Contains any other recognized serious safety or health hazard.



Following procedure will be adopted for any confined space entry:-

- Analysis of any alternative solution to avoid such entry.
- Safety Coordinator will designate a team of safety wardens to inspect the confined space.
- Safety inspector will suggest the safety precautions before entry.
- Safety wardens will suggest whether there is any need of ventilation and lighting.
- Safety wardens will suggest whether any lock out or tag out is required or not.
- Work permit will be issued after observing all such precautions.
- Safety coordinator will sign the work permit.
- All the activity will be monitored by the safety inspector.
- Safety will be authorized to stop the activity any time sensing it to be dangerous.
- At the completion of the job safety coordinator will close the work permit

## **DETAILED PROCEDURE OF SSCL FOR CONFINED SPACES:**

### **Background**

Death and injuries in confined spaces are often the result when employees disregard proper safety procedures, take short cuts, refuse to accept the fact that a space may have been safe for years in the past, could develop into a deadly hazardous space and when supervisory personnel fail to heed safety standards and management does not remain fully aware as to what is really taking place in their confined space activities.

Confined space accidents are completely preventable, and when proper training, supervision, equipment and devices are applied, confined space entry is a safe and routine working procedure. The currently accepted state-of-the-art policies and requirements for confined space entry is the OSHA standard 29 CFR 1910.146. Contractors providing services are required to follow the OSHA requirements as "host employer" is obligated to furnish to the employer information regarding permit spaces, hazards and internal program requirements.

### **PROCEDURES:**

#### **IDENTIFICATION OF CONFINED SPACES:**

For the purposes of this Environmental Health and Safety program, a confined space is an enclosed area that must be entered into to perform a maintenance task on a regular or emergency basis. The confined space may be difficult to enter and leave, have one or more physical or chemical hazards, and may have the remote possibility of trapping the person entering, especially if the person is incapacitated. This program will provide a method of planning and documenting an entry into such an area, provide a checklist of safety precautions, and assure that emergency rescue can be immediately accomplished, if it becomes necessary.



**BY DEFINITION, A CONFINED SPACE IS A SPACE THAT:**

- ✚ Is large enough to be entered;
- ✚ Has limited means of entry and exit; and
- ✚ Is not designed for continuous employee occupancy.

*For the purposes of this program, examples of confined spaces might include:*

- ✚ Tanks
- ✚ Vessels
- ✚ Vaults
- ✚ Pits (i.e., swimming pool valve and filter pits, etc.)
- ✚ Elevated water towers
- ✚ Boilers

**Note** that these spaces could reasonably have atmospheres that are oxygen deficient or contain other hazards for the purposes of this program, examples of spaces not generally defined as confined spaces might include:

- ✚ Building attics
- ✚ Building crawl spaces
- ✚ Some elevator shafts
- ✚ Walk-in HVAC air handling units

All confined spaces shall be ENTRY PERMIT REQUIRED CONFINED SPACES. Such confined spaces include, but are not limited to, electrical vaults, storm water manholes, sewage manholes, sewage lift stations, and boilers.

**EMPLOYEES WILL NOT ENTER THE FOLLOWING CONFINED SPACES UNDER ANY CIRCUMSTANCES:**

- ✚ Boiler firebox
- ✚ Water tower reservoir tank
- ✚ Energized electrical transformer vaults

DANGER – PERMIT REQUIRED CONFINED SPACE signs, meeting OSHA specifications, shall be posted at all identified confined space entrances. Where not appropriate to place at the entrance (i.e. streets, sidewalks, etc.) the signs will be placed immediately under the cover (hatch, door, lid, etc.) in such a manner as to prevent entry unless the sign is removed.

**GENERAL CONFINED SPACE ENTRY PROCEDURES:**

- All confined space entries will be documented on the Confined Space Entry Form (permit). No entry will be allowed unless the permit is completed and approved by the designated supervisor. An entry can be up to one shift or eight hours in length. If a confined space entry has been completed and must be re-entered during the same shift or eight-hour day, a new entry form or permit must be completed.
- Confirm that all energy sources in the space are de-energized and are locked and tagged out, in strict compliance with proper lock out/ tag out (LOTO) procedures. Confirm that all engulfment hazards have been eliminated and persons controlling those hazards are aware of the space entry.
- Before entry is made into any designated confined space, the atmosphere must be tested for adequate oxygen and possible presence of toxic gasses. Proper procedure is to test immediately under the cover (or top), near the middle of the space, and at the bottom of the space. If possible, the space shall be tested before removing the hatch or manhole cover.
- Hard hats shall be worn at all times while working within confined spaces unless such use prevents a particular job from being performed and creates a greater safety hazard. The supervisor and the person authorizing the entry shall verify all conditions in which hard hats are not to be used.
- A trained observer with visual or audible contact with the worker and radio contact for emergency forces notification shall be used on all confined space entries. At least one trained observer must be immediately outside the space entrance and in constant contact with entrant during the entire entry.
- Training provided to employees does not include entry rescue. Rescue must be accomplished by extraction of the worker from confined spaces.

**NOTE:** 60 PERCENT OF CONFINED SPACE FATALITIES ARE PERSONS ATTEMPTING TO RESCUE DOWNED EMPLOYEES.

- Entry into a Permit Required Confined Space will not be initiated unless the entering employee is properly wearing a body harness and retrieval system (tripod) is attached.
- Where more than one worker is required to enter the same space for a particular job, each worker must be attached to a separate retrieval system. Positions and moves must be coordinated to avoid entanglement of the equipment.
- Mechanical ventilation shall be utilized and maintained for the duration of the entry on all confined space entries.
- A means of communication (visible, audible, or electronic) must be established and maintained during the entire project between the person in the space and the outside observer. The observer must be fully equipped with all necessary personal protective equipment, and have no other duties or responsibilities than the safety of people inside of the confined space and will not leave that position until the project has been completed and all personnel have evacuated the confined space, or the observer is relieved by another fully qualified and equipped individual.
- Lock-out/tag-out procedures as per 29 CFR 1910.147, requiring the isolation of energy and physical hazards shall be observed.
- Safety Related Work Practices as per 29 CFR 1910.331 through 1910.335 shall be observed.
- In all Permit Required Confined Spaces, continuous monitoring will be performed in addition to continuous mechanical ventilation. As long as the atmosphere is within safe limits the personnel



will continue with the work assignment, inspection, or procedures with no deviations from normal routine. If the atmospheric conditions change, the personnel will exit immediately and take whatever precautions are necessary for self and crew protection. If conditions exist that inevitably will contribute to unsafe atmospheres (i.e. welding, use of hazardous chemicals, sewage manholes and lift stations), work will stop immediately upon the sounding of an alarm and the employee(s) will exit the space and not re-enter until acceptable limits are restored. Employees will not re-enter the space for one hour after the second evacuation, regardless of the conditions.

- If the worker becomes drowsy, nauseous, has blurred vision or difficulty in breathing, the worker must evacuate immediately and notify the respective supervisor or foreman. Ringing in the ears indicates a serious lack of oxygen.
- In the event of a severe injury or asphyxiation, emergency rescue procedures will be enacted immediately. The Department of Public Safety at X999 or by radio, Inform them that you have a "confined space emergency and to contact Ferry Pass/EMS Rescue and an ambulance immediately." Give the dispatcher your name and specific location. The emergency rescue unit will be notified and also the director of EH&S shall be informed.
- All permit entry files, training records and permits must be kept on file at least 5 years from the date of the last training, inspection, test, maintenance or entry.

#### **CONFINED SPACE SAFETY AND TRAINING PROGRAM:**

- All employees performing confined space work will receive a minimum of eight hours initial training and sufficient (eight hours recommended) annual training to ensure competency during the entry.
- At least one member of the confined space entry team must be trained in CPR/First Aid. Recommendations are for all confined space entrants to be trained in first aid/CPR. In order to meet the requirements of emergency rescue, the employer shall ensure that rescue services are available. Due to the nature of potential confined space incidents, the time of emergency medical services availability is approximately four minutes. The Site must be prepared to deal with such incidents and potential injuries.

#### **CONFINED SPACE EMERGENCY RESCUE PROCEDURES:**

- When an emergency rescue is necessary from any confined space, the rescue must be immediate. Always have sufficient and adequate emergency rescue equipment available for this purpose. Take steps to make the rescue without endangering other personnel. Do not enter the confined space. No rescue will be attempted by unauthorized personnel. Wait for professional rescue services.
- Extract the incapacitated worker as quickly and safely as possible with the extraction equipment. Avoid further injury of the employee by guiding body and limbs past obstructions with poles and rods.
- Immediately assess the injury or the problem to determine the injury, and the condition of the victim. You do not have time to conduct an extensive physical examination, only to determine the specific type of injury and the extent of the injury. Check for serious conditions starting with breathing, heartbeat, bleeding, fractures, and bruises and then related injuries.
- In the event of a back or neck injury, additional and extreme care must be exercised in order to prevent further damage or death to the victim. During the removal process and the transporting of the victim, the back and neck must be maintained in normal alignment. Do not twist the back



- or the neck and make all body movements in one movement so as to maintain proper alignment.
- Following the removal of the victim from the confined space provide for all necessary primary and follow-up life support assistance as necessary.

Each employee that may be required to enter into a designated confined space shall be properly trained in subjects that are necessary and applicable to their own confined space entry needs selected from the following list of subjects:

- The potential hazards that could be confronted.
- Safety precautions, emergency procedures and hazards exposure treatment.
- Personal protective equipment, clothing and devices.
- Inspection, use, selection and fitting of safety harness and life lines.
- Traffic control and job-site protection.
- First aid and cardiopulmonary resuscitation (CPR).
- Proper testing and monitoring of confined spaces.
- Decontamination of confined spaces.
- Electrical, mechanical isolation procedures when required.
- Proper ventilation procedures.
- Emergency entry and exit procedures including solo escapes.

#### **TYPICAL HAZARDS OF CONFINED SPACES:**

- Vehicular traffic striking the employee while working on the streets or highways because of no, improper or inadequate job site safety signs, barricades or traffic cones.
- Metal fatigue of built in steps or improperly installed and secured portable ladders inside the space.
- Hang up of safety harness or life lines inside structures.
- Loss of handgrip on steps or ladder while attempting to ascend or descend.
- Carrying items in the hands instead of having them lowered or raised in a suitable bucket or container.
- Slipping, tripping or falling in, on, or around internal structures because of water, sewer, grease, poor housekeeping or other debris.
- Entrapment in trenches over 4-feet deep due to cave-ins.
- Unexpected surge of sewage into the space due to failure to by-pass the flow while using air bags or J-Plugs, when the surge pressure builds up over the limits of the air bag or J-Plug.
- Failure or breakdown of the fresh air ventilation device.
- Carbon Monoxide or other contaminants being pulled into the fresh air blower.
- Unexpected change of the atmosphere after the initial monitoring is completed. Fifty per cent of confined space injuries involve changes to the atmosphere after the initial monitoring is complete and the workers fail to continuously test.
- Unexpected seepage of methane gas into the space or an underground LP gas line rupture and the gas finding its way along underground sewer lines, water lines or electrical lines or ground cavities into the sewer or station.
- Excessive noises preventing the worker from hearing the gas detector alarm, the air pack low air warning alarm, or the outside observer directing the worker to exit the space.
- Objects falling into the space from overhead.



- Breathing air Oxygen deficiency or enrichment.
- Combustible gases or vapours.
- Toxic gases or vapours.
- Exhaustion of the worker inside the confined space.
- Electrical hazards.

## **PPE'S-PERSONAL PROTECTIVE EQUIPMENT'S:**

### **PURPOSE:**

The Personal Protective Equipment (PPE's) program has been developed to provide employees and workers with the necessary information to identify work situations that require the use of PPE, the proper selection and use of PPE, and documentation of this information.

Personal protective equipment, or PPE, includes a variety of devices and garments to protect workers from injuries. PPE includes:

- Goggles.
- Face Shields.
- Safety Glasses.
- Hard Hat.
- Safety Shoes.
- Gloves.
- Safety Belt, Harness.
- Earplugs and Ear Muffs
- Respirators
- Aprons and Body Protection

### **TRAINING:**

Prior to conducting work requiring the use of personal protective equipment, employees/workers will be given training by the SBG O & M safety Team to know:

- When PPE is necessary?
- What type is necessary?
- How it is to be worn?
- What its limitations are?
- Proper care, maintenance, useful life, and disposal



## SCAFFOLDS SAFETY-PROCEDURES:

### DEFINITIONS:

**Brace:** A tie that holds one scaffold member in a fixed position with respect to another member.

**Coupler:** A device for locking together the component parts of a tubular metal scaffold which shall be designed and used to safely support the maximum intended loads.

**Light duty scaffold:** A scaffold designed and constructed to carry a working load not to exceed 25 pounds per square foot.

**Medium duty scaffold:** A scaffold designed and constructed to carry a working load not to exceed 50 pounds per square foot.

### GENERAL TYPES OF SCAFFOLDING:

- Frame Scaffolding
- Tube and Clamp
- Modular System Scaffolds
- Rolling Scaffolds

### GENERAL SAFETY REQUIREMENTS FOR ALL SCAFFOLDS:

- Scaffolds shall be furnished and erected for persons engaged in work that cannot be done safely from the ground or from solid construction.
- The footing or anchorage for scaffolds shall be sound, rigid and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, concrete blocks shall not be used to support scaffolds or planks.
- Scaffolds and their components shall be capable of supporting without failure at least four times the maximum intended load.
- Any scaffold damaged or weakened from any cause shall be immediately repaired and shall not be used until repairs have been completed.
- Scaffolds shall not be loaded in excess of the working load for which they are intended.
- Nails or bolts used in the construction of scaffolds shall be of adequate size and in sufficient numbers at each connection to develop the designed strength of the scaffolds.
- All planking or platforms shall be overlapped (minimum 12 inches) or secured from movement.
- An access ladder or equivalent safe access shall be provided.
- Scaffold planks shall extend over their end supports not less than 6 inches nor more than 18 inches.
- Tools, materials, and debris shall not be allowed to accumulate in quantities to cause hazard.
- Wire or fiber rope used for scaffold suspension shall be capable of supporting at least six



times the intended load.

- Scaffolds cannot be erected, used, closer than 10 feet (3.1m) near energized power lines. (From 300 v to 50 kV).
- Scaffolding must always be secure when height of the scaffold exceeds four (4) times the minimum base width.

## **HAND AND POWER TOOLS OPERATING PROCEDURES:**

### **HOW TO AVOID TOOL INJURIES:**

- Always wear safety glasses when using hammers, chisels, punches, wire cutters, saws, files, crowbars, bolt cutters, or any tool that could create chips or pieces.
- Wear cut resistant gloves when handling knives or other sharp edges.
- Arrange the work and use tools so that the tool will move away from your hands and body if slips.
- Make sure that the material you are working on is held securely
- Stand where you have firm footing and good balance while you use tools

### **USE THE RIGHT TOOL THE RIGHT WAY:**

- Keep the screwdriver handle clean. A greasy handle could cause an injury or damage from unexpected slippage.
- Store screwdrivers in a rack or partitioned pouch so that the proper screwdriver can be selected quickly.
- Do not hold the stock in one hand while using the screwdriver with the other. If the screwdriver slips out of the slot you may cut your hand.
- Do not try to use screwdrivers on screw heads for which they are not designed.
- Do not use defective screwdriver (i.e. ones with rounded or damaged edges or tips; split or broken handle; or bent shaft).
- Do not use screwdrivers for prying, punching, scoring, scraping or stirring paint.
- Do not carry screwdrivers in your pockets.



**MAINTENANCE OF TOOLS:**

Tools will last longer when take care of them:

- Inspect tools before using them and before putting them away.
- Maintain and repair tools before it is too late. Sharpen cutting edges regularly. Avoid waiting until they are completely dull before trying to sharpen them. Replace loose handles on hammers.
- Keep tools clean. Grease and dirt can hide damage, and prevent you from getting a good grip when you use the tool.
- Discard damaged tools. Striking tools with mushroomed surfaces, screwdrivers with rounded edges or bent shafts, or bent pliers are examples of tools that can cause more harm than good.

**WELDING AND CUTTING PROCEDURES:****CYLINDERS:**

Oxygen and Acetylene are stored under pressure in steel cylinders. They are sized by the cuft Of either Oxygen or Acetylene that they hold.

Cylinders should be tested regularly with the date of the last test stamped on the top of the cylinder. Cylinders should always be secured and used in the upright position. When a cylinder is not being used, the valve cap should always be in place.

**OXYGEN CYLINDERS:**

These cylinders are made of steel and are usually painted green. They range in size from less than 20 cuft. To over 300 cuft and contain compressed Oxygen at pressures that can be as high as 2200 psig. All cylinders have valves and (except the small "R" tank) are fitted with a screw on steel cap that protects the cylinder valve when the cylinder is not in use. If Oxygen comes into contact with oil or grease, it will burst into flame. Never use oil or grease on Oxygen cylinder valves or regulators. Make sure hands and gloves are free of oil and grease before handling cylinders. Crack open the cylinder valve then close it before installing the regulator to clear the valve of any dirt. With the regulator installed, always crack the cylinder valve open first, then open it fully. This will lessen the chance of recompression which is caused by high cylinder pressure entering the regulator, heating up and damaging the regulator.

**REGULATORS:**

With the pressure in a full Acetylene cylinder at 250 psig and a full Oxygen cylinder at 2200 psig, a way is needed to lower these cylinder pressures to desired working pressures for use in the torch. This is accomplished by using an adjustable pressure reducing regulator. The regulator will also maintain a steady working pressure as the cylinder pressure drops from use.

**WELDING HOSES:**

The cylinder regulators and torch are usually connected together by double line rubber hoses. Double line hose is known as type VD. The Oxygen line is greens, the fuel line red. Hoses are available in four sizes, 3/16, 1/4, 3/8 and 1/2 inch

**CHECK VALVES:**

For combustion to occur, fuel and Oxygen have to mix. This should only happen in the torch mixer or the torch tip. Sometimes, due to improper operation, fuel and Oxygen could feed back into the hoses and cause combustion in the hoses or regulators. (Not good!) Check valves when installed between the hoses and torch prevent this back flow as they close if a reverse flow starts. Check valves should be used with all torches.

**FLASH BACK ARRESTORS:**

A flashback, which is a rapid high pressure flame in the hose, can occur if there aren't any check valves or the check valves fail to operate due to improper installation. Once a flashback starts, check valves cannot stop it, but a flashback arrestor will! The arrestor connects the same as the check valves, in the hose at the torch or regulator and contains a trap that is spring loaded that cuts off the gas flow in the event of a flashback. Both check valves and flashback arrestors are like they say, cheap insurance and should be included on every Oxy-Acetylene outfit!

**TORCHES:**

The torch assembly consists of the handle, oxygen and fuel gas valves and mixing chamber. Welding tips or a cutting attachment can be used with the handle allowing it to be used for welding, heating and cutting operations. Oxygen and fuel gas flow through tubes inside the handle which blend in the mixing chamber or tip. It is at the tip that the mixed gases are ignited. There are two basic mixer types, the equal or medium pressure type (also known as balance or positive pressure type) and the injector type. The equal pressure type is the most common and is used with fuel gas pressures that are above 1 psi. Oxygen and fuel gas enter the torch at almost equal pressures. The injector type is used when fuel gas pressures are less than 1 psi. In this type, Oxygen at high pressure pulls the fuel gas into the mixing chamber.



## **WELDING AND CUTTING TIPS**

The welding tip is mounted on the end of the torch handle and through it the oxygen and fuel gas mixture feed the flame. Tips are available in a variety of shapes and sizes to fit most any welding job and are identified by number. The larger the number, the larger the hole in the tip and the thicker the metal that can be welded or cut. Welding tips have one hole and cutting tips have a centrally located hole with a number of smaller holes located around it in a circular pattern. The cutting Oxygen comes from the centre hole with the preheat flame coming from the holes around it. Many factors determine the size tip to use, but mainly the thickness of the metal to be welded or cut determines which tip size to use. The attachments at the end of this article will serve as a guide to tip selection.

### **CUTTING ATTACHMENTS:**

A cutting attachment connects to the end of the torch handle in place of the welding tip and allows for the cutting of metal up to 8 inches thick. For cutting metal over 8 inches, the use of a cutting torch instead of a cutting attachment should be used. The fuel gas valve on the torch handle is used to adjust the fuel. The Oxygen valve on the torch handle is opened full and the Oxygen flow for the preheat flame is adjusted using the Oxygen valve on the cutting attachment. The cutting Oxygen is controlled by the lever operated valve on the attachment.

### **CUTTING TORCH:**

The cutting torch is connected to the hoses in place of the welding handle and is used for cutting thicker metal than can be cut with the cutting attachment, or for heavy duty cutting work. The cutting torch like the welding handle is equipped with Oxygen and fuel gas valves with a lever operated Oxygen valve that controls the flow of cutting Oxygen to the tip. (Centre hole in the cutting tip) In the two tube model, Oxygen and fuel gas mix and flow to the tip in the larger bottom tube with the cutting Oxygen flowing to the tip in the top tube. In three tube models, Oxygen and fuel gas flow to the tip in the bottom tubes and cutting Oxygen flows to the tip in the top tube.

### **WELDING SAFETY GUIDELINES:**

1. Staff approval is required before using any welding equipment.
2. Welders, assistants, and anyone else in the welding area shall wear glasses or shields of recommended shades during welding operations.
3. The welder is responsible for erecting a screen around the welding area to protect other personnel in the shop from eye injury.
4. Inspect all welding equipment to be used, prior to each use, for possible damage.
5. Avoid handling oxygen bottles with greasy hands, gloves or rags. Fatal explosions have resulted from this cause.
6. Always strap tanks to a welding cart or a fixed object. Never allow a gas cylinder to be free standing. Replace the safety cap on all cylinders when not in use.
7. When arc welding, make sure work and/or work table is properly grounded.
8. Do not arc weld in a wet area.
9. Be alert to possible fire hazards. Move the object to be welded to a safe location, or, remove all



flammable materials from the work area.

10. Never weld in the same area where degreasing or other cleaning operations are performed.
11. Keep suitable fire extinguishing equipment nearby and know how to operate it.
12. Shut off the cylinder valves when the job is completed, release pressure from the regulators by opening the torch valves momentarily and back out regulator adjusting valves. Never leave the torch unattended with pressure in the hoses.
13. Utilize all protective equipment and clothing. Do not arc weld with any part of the body uncovered, the arc light is actinic light (excessive ultraviolet) and will cause burns similar to severe sunburn.
14. Never weld inside drums or enclosed spaces without adequate ventilation, or, the use of airline respirators or self-contained breathing apparatus.
15. Check the ventilation system before starting to weld and periodically thereafter to insure adequate performance. Welding fumes should not be allowed to get into the rest of the shop working areas.
16. Never cut or weld any container that has held explosive or flammable materials. Use prescribed methods for cleaning or flooding.
17. Never use wrenches or tools except those provided or approved by the gas cylinder manufacturer to open valves. Never use a hammer to open or close valves.
18. Abide by any other safety measures required for each particular type of welding.
19. Allow for proper ventilation when brazing or soldering. The fluxes are acidic and toxic.
20. Do not weld on painted, galvanized or greasy, oily metals. Not only can the fumes be toxic, but the welds will not be satisfactory and will fail in use.

#### **WELDING GOGGLES & GLOVES:**

Proper welding gloves and goggles must be worn to provide protection when using a Oxy-Acetylene outfit. Gloves should be made for welding use. Goggles (or face shield) must be worn to protect the eyes from sparks and hot metal, especially when cutting metal. If you ever try to weld or cut without using goggles or a face shield, try this first. Stand in front of the outfit, close your eyes tight and adjust the regulators that are if you can find them!!! (Point made I hope!!) The proper lens shade should be selected in order to provide the maximum amount of protection. The following chart lists the recommended shade of lens that should be used for various welding and cutting operations.

#### **METAL CUTTING SAFETY:**

The Basic Rules:

1. Never work alone.
2. At least two adults must be in the shop when power tools are being used.
3. Never work when you are impaired.
4. This includes when you are too tired, stressed or hurried to work carefully.
5. If you cannot do a job safely in this shop, don't do it.
6. There are limits to what we can build here.
7. Always wear closed-toe shoes in the shop.
8. Tools, chips and fixtures are sharp, and often hot. Shoes will help protect your feet from injury. Leather shoes are preferred when welding.
9. Eye protection is essential. Always wear safety glasses when working or cleaning tools.
10. Prescription glasses sold in the US with plastic lenses meet ANSI Standard Z87.1 for safety.
11. Remove or secure anything that might get caught in moving machinery.
12. Rings, necklaces, long hair and loose clothes that get caught in tools can drag you along.



13. Keep your hands away from sharp tools.
14. Make sure that nothing that you do will cause you to be cut.
15. Dust, chemicals and smoke can be dangerous – work in well-ventilated areas, minimize contamination and use appropriate protective equipment.
16. The safety equipment cabinet is on the patio.
17. If you're unsure about the safe operation of a tool or any aspect of a job – ask for help! Have shop staff check you out on a tool the first time you use one with which you are unfamiliar.
18. Clean up after yourself.
19. Before you leave the shop each day all tools must be returned to the toolbox, the machine cleaned and wiped down and the floor swept. Leave 10-15 minutes for clean-up.

#### **GENERAL SAFETY GUIDELINES:**

1. Do not attempt to remove foreign objects from the eye or body. Report to the student health service for medical treatment. If chemicals get in the eye(s), wash eye(s) for 15 minutes in an open flow of water before proceeding for medical treatment.
2. Avoid excessive use of compressed air to blow dirt or chips from machinery to avoid scattering chips. Never use compressed air guns to clean clothing, hair, or aim the gun at another person.
3. Machines must be shut off when cleaning, repairing, or oiling.
4. Do not wear ties, loose clothing, jewellery, gloves, etc. around moving or rotating machinery.
5. Long hair must be tied back or covered to keep it away from moving machinery. Hand protection in the form of suitable gloves should be used for handling hot objects, glass or sharp-edged items.
6. Wear appropriate clothing for the job (i.e. do not wear short sleeve shirts or short pants when welding).
7. Do not work in the shop if you are tired or in a hurry – this almost always ruins the work, and often results in injury.
8. Never indulge in horseplay in the shop areas.
9. All machines must be operated with all required guards and shields in place.
10. A brush, hook, or special tool is preferred for removal of chips, shavings, etc. from the work area. Never use your hands to clean cuttings – they are sharp!
11. Keep your fingers clear of the point of operation of machines by using special tools or devices, such as, push sticks, hooks, pliers, etc. Never use a rag near moving machinery.
12. A hard hammer should not be used to strike a hardened tool or any machine part. Use a soft faced hammer.
13. Keep the floor around machines clean, dry and free from trip hazards. Do not allow chips to accumulate.
14. Think through the entire job before starting. Ask for help if you have questions.
15. Before starting a machine, always check it for correct setup and always check to see if machine is clear by operating it manually, if possible.
16. If you have not worked with a particular material before, check the hazardous materials data sheets book for any specific precautions to be taken while working with the material. Also, ask the shop personnel before cutting any unusual material.
17. Heavy sanding and grinding should only be done in well-ventilated areas, preferably on the patio. Painting on the patio only – make sure that the doors to the shop are closed.
18. Follow all appropriate precautions when working with solvents, paints, adhesives or other chemicals. Use appropriate protective equipment.
19. Safe procedures for most shop operations are described in the Health and Safety Procedures



Notebook located by the safety cabinet.

20. Check the power cords and plugs on portable tools for before using them.
21. Always store oily rags in an approved metal container.

## **HOT WORK PROCEDURES:**

### **SAFETY WARDEN CHECKLIST:**

All must be checked prior to issuing permit and beginning of work.

- ☐ We have swept combustible materials such as paper clippings, wood shavings, or textile fibres clean for a radius of 35 feet from the work.
- ☐ Combustible floors (except wood on concrete) are wet, covered with damp sand, or protected by fire-resistant shields. Employees have been protected from electrical shock from wet or damp floors.
- ☐ We have relocated combustibles at least 50 feet from the work. Where relocation is not practicable, we have protected combustibles with flameproof covers or shielded them with metal or fire-resistant guards or curtains. Edges of covers at the floor are tight to prevent sparks from going under them.  
Where practicable, we have relocated all materials easily ignitable by sparks.
- ☐ We have tightly covered openings or cracks in walls, floors, or ducts within 35 feet of the work to prevent the passage of sparks to adjacent areas.
- ☐ We have taken precautions to prevent the ignition caused by conduction or radiation on the other side of welding done on a metal wall, partition, ceiling, or roof.
- ☐ We have used fire resistant shields or guards where combustible walls, partitions, ceilings, or roofs are nearby.
- ☐ We have protected ducts or conveyor systems that might carry sparks to distant combustibles.
- ☐ There is not an explosive atmosphere (mixtures of flammable gases, vapours, liquids, or dusts in the air) present.
  
- ☐ Existing sprinkler systems are operational. For welding in close to a sprinkler head, we have placed a wet rag over the head and will remove it at the conclusion of the operation.
- ☐ We have a fully charged and operable fire extinguisher, appropriate for the type of fire, at the work area.

**Fire Watch is required if any one condition below exists. Check each item that applies:**

- ☐ Combustible material in building construction or contents is present within 35 feet of point of operation.
- ☐ Combustible material that is easily ignitable by sparks is nearby.
- ☐ Wall or floor openings are within a 35 foot radius which exposes 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 which may be ignited by conduction or radiation.

**RESPONSIBILITIES OF FIRE WATCH:**

1. Have fire extinguishers readily available and be trained in its use.
2. Be familiar with sounding an alarm and contacting fire department in the event of a fire.
3. Watch for fires in all exposed areas and try to extinguish them only when obviously within the capacity of the equipment available or otherwise sound alarm and contact fire department.
4. Be present for at least a half hour after completion of welding/cutting operations to check for possible smouldering fires.
5. Periodic checks must be made for two hours after completion to assure there are no smouldering fires.
6. Have a copy of the Hot Work Permit in hand to be familiar with fire hazard areas.

**FIRE WATCH ASSIGNED TO THIS OPERATION:**

Welding/cutting operation ended at what time: \_\_\_\_\_ : \_\_\_\_\_ (AM/PM)

Fire Watch present \_\_\_\_\_ : \_\_\_\_\_ (AM/PM) \_\_\_\_\_ : \_\_\_\_\_ (AM/PM)  
from: \_\_\_\_\_

Times of periodic \_\_\_\_\_ : \_\_\_\_\_ (AM/PM) \_\_\_\_\_ : \_\_\_\_\_ (AM/PM)  
checks: \_\_\_\_\_

Site Was Checked 30 Minutes after Completion of Work by: \_\_\_\_\_

\_\_\_\_\_  
Signature Of Welding/Cutting Supervisor

\_\_\_\_\_  
Date:

\_\_\_\_\_  
Signature of Fire Watcher

\_\_\_\_\_  
Date:





## COLD WORK PROCEDURES:

<b>Date:</b>		<b>Form No:</b>
<b>Type of Work :</b>		
<b>Location :</b>		
<b>Which tools will be used?</b>		
<b>Checks :</b>	<b>OK No N/A</b>	<b>Action Required?</b>
1. Working staff have been advised		
2. No heat producing equipment to be used		
3. Fire extinguisher and/or fire hose reel accessible		
4. Sprinklers and other fire protection equipment is operational/free from obstructions		
5. Mechanical fastening of any fixtures		
6. No electrical equipment or other potential ignition sources to be installed on or adjacent to panels		
7. PPE's available?		
8. Working staff are competent to perform the job?		
9. Are all the hazards have been removed?		

<b>Final Check</b>	<b>OK No N/A</b>	<b>Action Required?</b>
The authoriser is to re-inspect the work area at least 30 minutes after the completion of the works.		
1. All joint strips that were removed have been replaced		
2. All exposed insulation and penetrations have been appropriately covered and sealed with metal plating		
3. There is no evidence of fire, hot surfaces, or potential ignition sources		
4. All waste materials have been removed		
Signed: _____ Name: _____ Title: _____		



**SAFETY PROCEDURES NEED TO BE ENSURED:**

1. Only competent and authorized persons must perform work activities.
2. An assessment of the work area have been undertaken and made as safe as possible before the work starts.
3. All preventative precautions have been taken whilst the work is in progress.
4. On completion of the work, the area must be made safe. The person in charge of the work must re-visit the work area after a suitable period of time to ensure that there are no signs of possible hazards existence.
5. All the control and preventative measures stipulated in the cold work procedures must be rigorously followed.

**DUTIES OF THE WORKER:**

1. Work in compliance with the risk assessment and workplace instructions
2. Supervise, erect and maintain any barriers, screens or other protective measures
3. Ensure/arrange communication and/or reporting procedures for emergency situations as appropriate
4. Keep the work area clean, tidy and free from any combustible materials
5. Leave the area in a safe condition if the work is suspended.

**HIGH RISK OPERATIONS- EHS PROCEDURES:**

Site Name: \_\_\_\_\_ Location: \_\_\_\_\_

EHS Representative: \_\_\_\_\_ ID#: \_\_\_\_\_

**SCOPE DEFINITION:**

This procedure outlines the system used to identify, qualify, and document employee training for high-risk operations they may encounter while working.

**HIGH-RISK WORK ACTIVITIES:**

High risk operations Include but are not limited to:

- ❖ Confined space entry \_\_\_\_\_ ☐
- ❖ Toxic/flammable material use \_\_\_\_\_ ☐
- ❖ Excavation \_\_\_\_\_ ☐
- ❖ Demolition \_\_\_\_\_ ☐
- ❖ Elevated work locations \_\_\_\_\_ ☐
- ❖ High/low voltage electrical work \_\_\_\_\_ ☐
- ❖ Other high risk activities \_\_\_\_\_ ☐

**SAFETY PROCEDURES:**

- ✓ No employee shall perform a high-risk operation for which they are not qualified
- ✓ Employees performing high-risk operations must complete on the job safety training that includes an assessment of learning
- ✓ The staff may not undertake high-risk operations for which he is not qualified
- ✓ Positive safety attitude, consciousness and awareness related to the high risk activities is



essential

- ✓ Be Experienced & familiarity with the type of equipment to be worked on
- ✓ Thorough understanding of the hazards associated with the normal operational procedure and the potential hazards under abnormal occurrences (e.g. mechanical failure, power failure, line break, pressure loss, over-pressurization, etc.).
- ✓ Ensure that this High-Risk Operations program is implemented at their site
- ✓ Ensure that each employee performing high-risk work activities at a designated site
- ✓ Ensure employees are completely trained for high-risk operations in a timely manner
- ✓ Ensure that all high-risk operations and processes existing at work site are identified and addressed either by a specific procedure
- ✓ An assessment shall be made to determine if the operation can be eliminated or risks associated with the operation reduced or further mitigated
- ✓ Targeted inspections of high risk operations shall be conducted on a periodic basis when these activities are occurring



HAZARD OR REGULATORY COMPLIANCE ISSUES	High Risk Y/N	PRIORITY				CONTROL ACTION(S)
		H <input type="checkbox"/>	M <input type="checkbox"/>	L <input type="checkbox"/>	NA <input type="checkbox"/>	
Chemical Use and Exposure		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Flammable, Explosive, and High Pressure Materials		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Physical Hazards (e.g., radiation, Heat, and noise/vibration)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Emergencies (e.g., medical, fire, Chemical release, and evacuation)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Confined Space Entry		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Control of Hazardous Energy Sources (lockout/tag out)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ergonomics		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Walking and Working Surfaces - Platforms, Scaffolds, and Ladders		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work at Heights		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Electrical Activities		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Hand and Power Tools		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Security Risks		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Temperature Extremes		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	



## **POLICY & PROCEDURES FOR CONFINED SPACES**

Any space which has following characteristics will be a confined space:-

- ✚ Limited entry and exit
- ✚ No or limited passage of fresh air
- ✚ Not designed for human work

As per OSHA guidelines, characteristics of “Non-permit confined space” & “permit-required confined space” are listed below:-

### **Non-permit confined space**

“Means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm”

### **Permit-required confined space**

“Means a confined space that has one or more of the following characteristics:-

- ✚ Contains or has a potential to contain a hazardous atmosphere
- ✚ Contains a material that has the potential for engulfing an entrant
- ✚ Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section or
- ✚ Contains any other recognized serious safety or health hazard.



Following procedure will be adopted for any confined space entry:-

- ✚ Analysis of any alternative solution to avoid such entry.
- ✚ Safety chief will designate a team of safety wardens to inspect the confined space.
- ✚ Safety wardens will suggest the safety precautions before entry.
- ✚ Safety wardens will suggest whether there is any need of ventilation and lighting.
- ✚ Safety wardens will suggest whether any lock out or tag out is required or not.
- ✚ Work permit will be issued after observing all such precautions.
- ✚ Safety warden will sign the work permit.
- ✚ All the activity will be monitored by the safety warden.
- ✚ Safety will be authorized to stop the activity any time sensing it to be dangerous.
- ✚ At the completion of the job safety warden will close the work permit
- ✚ Al Borj will administer or may request to SSCL for administering the entry by contractors or other organizations working in DOKAAE.

*Safety wardens will have the power to stop any activity which they think as a confined space entry without permit.*

### **Detailed Procedure of SSCL for confined spaces**

#### **Background**

Death and injuries in confined spaces are often the result when employees disregard proper safety procedures, take short cuts, refuse to accept the fact that a space may have been safe for years in the past, could develop into a deadly hazardous space and when supervisory personnel fail to heed safety





standards and management does not remain fully aware as to what is really taking place in their confined space activities.




Confined space accidents are completely preventable, and when proper training, supervision, equipment and devices are applied, confined space entry is a safe and routine working procedure. The currently accepted state-of-the-art policies and requirements for confined space entry is the OSHA standard 29 CFR 1910.146. Contractors providing services are required to follow the OSHA requirements as “host employer” is obligated to furnish to the employer information regarding permit spaces, hazards and internal program requirements.

## Procedure

### Identification Of Confined Spaces

For the purposes of this Environmental Health and Safety program, a confined space is an enclosed area that must be entered into to perform a maintenance task on a regular or emergency basis. The confined space may be difficult to enter and leave, have one or more physical or chemical hazards, and may have the remote possibility of trapping the person entering, especially if the person is incapacitated. This program will provide a method of planning and documenting an entry into such an area, provide a checklist of safety precautions, and assure that emergency rescue can be immediately accomplished, if it becomes necessary.






***By definition, a confined space is a space that:***

-  *Is large enough to be entered;*
-  *Has limited means of entry and exit; and*
-  *Is not designed for continuous employee occupancy.*





*For the purposes of this program, examples of confined spaces might include:*

-  *Tanks*



-  Vessels
-  Vaults
-  Pits (i.e., swimming pool valve and filter pits, etc.)
-  Elevated water towers
-  Boilers




*Note that these spaces could reasonably have atmospheres that are oxygen deficient or contain other hazards for the purposes of this program, examples of spaces not generally defined as confined spaces might include:*

-  Building attics
-  Building crawl spaces
-  Some elevator shafts
-  Walk-in HVAC air handling units

*Note that these spaces generally contain ambient air of the building, do not present an atmospheric hazard or pose a danger from engulfment or entrapment.*

All confined spaces under the control of SBGOM shall be ENTRY PERMIT REQUIRED CONFINED SPACES. Such confined spaces include, but are not limited to, electrical vaults, storm water manholes, sewage manholes, sewage lift stations, and boilers.

#### **Employees Will Not Enter The Following Confined Spaces Under Any Circumstances**






-  Boiler firebox
-  Water tower reservoir tank
-  Energized electrical transformer vaults

DANGER – PERMIT REQUIRED CONFINED SPACE signs, meeting OSHA specifications, shall be posted at all identified confined space entrances. Where not appropriate to place at the entrance



(i.e. streets, sidewalks, etc.) the signs will be placed immediately under the cover (hatch, door, lid, etc.) in such a manner as to prevent entry unless the sign is removed.

### **General Confined Space Entry Procedures**

-  All confined space entries will be documented on the Confined Space Entry Form (permit). No entry will be allowed unless the permit is completed and approved by the designated supervisor. An entry can be up to one shift or eight hours in length. If a confined space entry has been completed and must be re-entered during the same shift or eight-hour day, a new entry form or permit must be completed.
-  Confirm that all energy sources in the space are de-energized and are locked and tagged out, in strict compliance with proper lock out/ tag out (LOTO) procedures. Confirm that all engulfment hazards have been eliminated and persons controlling those hazards are aware of the space entry.
-  Before entry is made into any designated confined space, the atmosphere must be tested for adequate oxygen and possible presence of toxic gasses. Proper procedure is to test immediately under the cover (or top), near the middle of the space, and at the bottom of the space. If possible, the space shall be tested before removing the hatch or manhole cover.
-  Hard hats shall be worn at all times while working within confined spaces unless such use prevents a particular job from being performed and creates a greater safety hazard. The supervisor and the person authorizing the entry shall verify all conditions in which hard hats are not to be used.
-  A trained observer with visual or audible contact with the worker and radio contact for emergency forces notification shall be used on all confined space entries. At least one trained observer must be immediately outside the space entrance and in constant contact with



entrant during the entire entry.

- ✚ Training provided to employees does not include entry rescue. Rescue must be accomplished by extraction of the worker from confined spaces.

**NOTE:** 60 PERCENT OF CONFINED SPACE FATALITIES ARE PERSONS ATTEMPTING TO RESCUE DOWNED EMPLOYEES.

- ✚ Entry into a Permit Required Confined Space will not be initiated unless the entering employee is properly wearing a body harness and retrieval system (tripod) is attached.
- ✚ Where more than one worker is required to enter the same space for a particular job, each worker must be attached to a separate retrieval system. Positions and moves must be coordinated to avoid entanglement of the equipment.
- ✚ Mechanical ventilation shall be utilized and maintained for the duration of the entry on all confined space entries.
- ✚ A means of communication (visible, audible, or electronic) must be established and maintained during the entire project between the person in the space and the outside observer. The observer must be fully equipped with all necessary personal protective equipment, and have no other duties or responsibilities than the safety of people inside of the confined space and will not leave that position until the project has been completed and all personnel have evacuated the confined space, or the observer is relieved by another fully qualified and equipped individual.
- ✚ Lock-out/tag-out procedures as per 29CFR 1910.147, requiring the isolation of energy and physical hazards shall be observed.
- ✚ Safety Related Work Practices as per 29CFR 1910.331 through 1910.335 shall be observed.

In all Permit Required Confined Spaces, continuous monitoring will be performed in addition to



continuous mechanical ventilation. As long as the atmosphere is within safe limits the personnel will continue with the work assignment, inspection, or procedures with no deviations from normal routine. If the atmospheric conditions change, the personnel will exit immediately and take whatever precautions are necessary for self and crew protection. If conditions exist that inevitably will contribute to unsafe atmospheres (i.e. welding, use of hazardous chemicals, sewage manholes and lift stations), work will stop immediately upon the sounding of an alarm and the employee(s) will exit the space and not re-enter until acceptable limits are restored. Employees will not re-enter the space for one hour after the second evacuation, regardless of the conditions.



If the worker becomes drowsy, nauseous, has blurred vision or difficulty in breathing, the worker must evacuate immediately and notify the respective supervisor or foreman. Ringing in the ears indicates a serious lack of oxygen.



In the event of a severe injury or asphyxiation, emergency rescue procedures will be enacted immediately. The Department of Public Safety at X999 or by radio, Inform them that you have a "confined space emergency and to contact Ferry Pass/EMS Rescue and an ambulance immediately." Give the dispatcher your name and specific location. The emergency rescue unit will be notified and also the director of EH&S shall be informed.



All permit entry files, training records and permits must be kept on file at least 5 years from the date of the last training, inspection, test, maintenance or entry.

### **Confined Space Safety and Training Program**



All employees performing confined space work will receive a minimum of eight hours initial training and sufficient (eight hours recommended) annual training to ensure competency during the entry.



Supervisors (those issuing and authorizing permits) shall receive an initial 20 hours of training and



sufficient annual training (eight hours recommended) to maintain proficiency.



At least one member of the confined space entry team must be trained in CPR/First Aid. Recommendations are for all confined space entrants to be trained in first aid/CPR. In order to meet the requirements of emergency rescue, the employer shall ensure that rescue services are available. Due to the nature of potential confined space incidents, the time of emergency medical services availability is approximately four minutes. The Site must be prepared to deal with such incidents and potential injuries.



Proper training means that the training shall not be considered complete until actual demonstration by the employee to the supervisor, foreman, or safety officer that they have attained an acceptable degree of proficiency for entering and working in confined spaces. Each employee satisfactorily completing the respective training shall be issued an individual identification card or certificate certifying that the employee is qualified to enter and to work in confined spaces.

### **Confined Space Emergency Rescue Procedures**



When an emergency rescue is necessary from any confined space, the rescue must be immediate. Always have sufficient and adequate emergency rescue equipment available for this purpose. Notify 9999 and request an Emergency Rescue Unit immediately. Take steps to make the rescue without endangering other personnel. Do not enter the confined space. No rescue will be attempted by unauthorized personnel. Wait for professional rescue services.



Extract the incapacitated worker as quickly and safely as possible with the extraction equipment. Avoid further injury of the employee by guiding body and limbs past obstructions with poles and rods.



Immediately assess the injury or the problem to determine the injury, and the condition of the victim. You do not have time to conduct an extensive physical examination, only to determine the



specific type of injury and the extent of the injury. Check for serious conditions starting with breathing, heartbeat, bleeding, fractures, and bruises and then related injuries.

- ✚ In the event of a back or neck injury, additional and extreme care must be exercised in order to prevent further damage or death to the victim. During the removal process and the transporting of the victim, the back and neck must be maintained in normal alignment. Do not twist the back or the neck and make all body movements in one movement so as to maintain proper alignment.
- ✚ Following the removal of the victim from the confined space provide for all necessary primary and follow-up life support assistance as necessary.

The safety officer is responsible for providing safety expertise, making safety recommendations and coordinating safety programs as required, coordinating safety training and specialized courses relative to the confined space safety program.

Each employee that may be required to enter into a designated confined space shall be properly trained in subjects that are necessary and applicable to their own confined space entry needs selected from the following list of subjects:

- ✚ The potential hazards that could be confronted.
- ✚ Safety precautions, emergency procedures and hazards exposure treatment.
- ✚ Personal protective equipment, clothing and devices.
- ✚ Inspection, use, selection and fitting of safety harness and life lines.
- ✚ Traffic control and job-site protection.
- ✚ First aid and cardiopulmonary resuscitation (CPR).
- ✚ Proper testing and monitoring of confined spaces.
- ✚ Decontamination of confined spaces.





- ✚ Electrical, mechanical isolation procedures when required.
- ✚ Proper ventilation procedures.
- ✚ Emergency entry and exit procedures including solo escapes.

### **Typical Hazards Of confined Spaces**

- ✚ Vehicular traffic striking the employee while working on the streets or highways because of no, improper or inadequate job site safety signs, barricades or traffic cones.
- ✚ Metal fatigue of built in steps or improperly installed and secured portable ladders inside the space.
- ✚ Hang up of safety harness or life lines inside structures.
- ✚ Loss of handgrip on steps or ladder while attempting to ascend or descend.
- ✚ Carrying items in the hands instead of having them lowered or raised in a suitable bucket or container.
- ✚ Slipping, tripping or falling in, on, or around internal structures because of water, sewer, grease, poor housekeeping or other debris.
- ✚ Entrapment in trenches over 4-feet deep due to cave-ins.
- ✚ Unexpected surge of sewage into the space due to failure to by-pass the flow while using air bags or J-Plugs, when the surge pressure builds up over the limits of the air bag or J-Plug.
- ✚ Failure or breakdown of the fresh air ventilation device.
- ✚ Carbon Monoxide or other contaminants being pulled into the fresh air blower.
- ✚ Unexpected change of the atmosphere after the initial monitoring is completed. Fifty percent of confined space injuries involve changes to the atmosphere after the initial monitoring is complete and the workers fail to continuously test.
- ✚ Unexpected seepage of methane gas into the space or an underground LP gas line rupture



and the gas finding its way along underground sewer lines, water lines or electrical lines or ground cavities into the sewer or station.

- ✚ Excessive noises preventing the worker from hearing the gas detector alarm, the air pack low air warning alarm, or the outside observer directing the worker to exit the space.
- ✚ Objects falling into the space from overhead.
- ✚ Breathing air Oxygen deficiency or enrichment.
- ✚ Combustible gases or vapours.
- ✚ Toxic gases or vapours.
- ✚ Exhaustion of the worker inside the confined space.
- ✚ Electrical hazards.

#### ✚ **Sewage System And Utilities Operations Pumping Stations And Underground Ventilation Procedures**

When necessary to ventilate a station, open all outside or adjacent manholes to provide for escape of incoming contaminants. Thirty-six-inch manhole lids should be lifted with a manhole lid lifter to minimize arm, back, and shoulder or neck injuries.

Open all roll-up doors and windows that would provide for a better inflow of air.






Auxiliary ventilation equipment may also be used to increase the value of the air being forced into the space.

Should these efforts fail to provide for a safe atmosphere that is within the acceptable limits, the space must now be considered as a permit entry space and the permit entry space requirements must be met?



## Sewer Lines And Manhole Ventilation Procedures

All underground sewer lines and manholes will be tested for hydrogen sulphide, methane gas contamination and oxygen deficiency before permitting any person to enter the space for normal working assignments. Contaminated sewer lines and manholes will be decontaminated as follows:

-  Safe atmosphere will contain from between 19.5% and 23.5% oxygen, toxic concentration no higher than 15 PPM, or more the 15 PPM of hydrogen sulphide concentration, flammable and explosive concentrations of less than 10% of its lower flammable limits (LFL).
-  Using a manhole lid lifter, remove all manhole covers both upstream and downstream. Structures over any manhole shall be opened for ventilation. Place appropriate “men working” signs, traffic cones, barricades or markers around the job-site prior to starting the work. If the work is in the street or highway, or within 5-feet of a street or highway employees must wear fluorescent safety vests in addition to hard hats as additional protective measures.
-  Test the atmosphere for safety. Should the atmosphere remain hazardous after the lids have been removed and ventilated for a reasonable period of time, the following procedures shall be conducted:-
  -  A fresh air supply capable of ventilating the space shall be placed into position and the fresh air blower duct direct the fresh air into the manhole or sewer line. Do not permit internal combustion engine exhaust near the blower, or upwind of the blower.
  -  An exhaust blower should be positioned to remove the atmospheric contamination from the manhole or sewer line should the fresh air blower not force the contamination out of the space.









- ✚ The discharge of the inlet fresh air blower and the intake of the exhaust blower should be positioned to maintain a circular air flow exchange within the sewer line or manhole. Should the atmosphere change within the sewer line or manhole remain above the acceptable limits after considerable attempts to ventilate the space has failed, the following procedures shall be used to further clear the air:
- ✚ J-Plugs or air bags of appropriate size will be inserted in the upstream and downstream lines to isolate the manhole. By-pass pumps will be used to by-pass the manhole or sewer line when necessary. Continuous ventilation should be maintained during the work process.
- ✚ Use extreme caution when using J-Plugs and air bags. Follow the manufacturer's recommendations regarding sizing and maximum air pressure to be used. Use a hand pump while inflating air bags and wear protective eye and face shields or goggles.
- ✚ For maximum convenience during entry and egress inside of small manholes the sewer saddle vent device should be used thereby permitting continuous ventilation of the manhole with a minimum of sacrificing the amount of open area in entering and leaving the manhole. In the event a rescue is necessary, the rescue can be accomplished without having to take the time to remove the air ventilation hoses.
- ✚ No employee shall be permitted to make a routine entry into any sewer line or manhole in which the atmospheric contamination exceeds the acceptable limits. Entry into a contaminated manhole or sewer line shall be made only for the purpose of emergency rescue, emergency repairs and/or decontamination purposes, and full safety and rescue equipment shall be used by the person entering the space with a standby observer, also fully equipped, and maintaining audible or visual contact at all times with the person inside of the manhole or the sewer line.



## **Manhole And Sewer Line Flow Control Operational Procedures**

When constant sewage flow in large sewer lines must be stopped, the following procedures will be followed during the entire operation:

-  Prior to the start of the project the entire project will be reviewed by the job-site foreman and the person in charge of manual operation of the involved sewage pumping station, this includes emergency potentials and plans. Coordination between the sewer crew and the pump station operator shall be via direct radio contact.
-  The pump station operator shall determine the safe length of time the particular station can remain out of service and shall inform the sewer crew foreman of the allowable length of available time the crew will have to work when the station is turned off.
-  The sewer crew foreman shall plan his work assignment in accordance with the limited time available during the pump station shut down, and so advise the crew.
-  When the crew is ready to actually begin work, the station operator shall be notified. The station operator shall pump the station wet well down to its lowest level without causing the pumps to become air bound (if the pumps are centrifugal) and then shut the pumping station off. The operator shall notify the sewer crew foreman that the pumps are off and the sewer crew will begin their work.
-  The station operator will notify the sewer crew foreman when one-half of the available time has expired, and thereafter in ten-minute intervals. Five minutes prior to having to start the pumping station pumps, the station operator will radio the sewer crew foreman who shall make certain that all personnel are out of the sewer line or manhole.
-  The sewer crew foreman will notify the station operator when all crew members are out of



the manhole or the sewer line and shall instruct the station operator to turn the pumps on.

- ✚ The pumping station operator shall not start up the sewage pumps until notified by the sewer crew foreman that all the members of the crew are out of the sewer line or the manhole.
- ✚ The pumping station operator shall start the pumps in a moderate sequence so as not to hydraulically overload the sewer line and cause a rupture.

### ✚ **Water Reservoir Maintenance**

The repair, cleaning, and sterilization of a ground reservoir are a specialized function.

Procedures for reservoir cleaning are to provide safe working conditions and shall be done in the steps as listed below:

- ✚ Inspection of exterior walking and working surfaces, ladders and safety railings. Aeration fans on reservoirs are to be arranged and equipped in a manner as to be inspected and repaired, if needed. Portable blowers must be ready for use if reservoirs are not the type equipped with aeration fans. Following the inspection and repairs, the tank would then be isolated from the treatment system and drained.
- ✚ While the tank is draining, the position of the valves operated during this procedure shall be recorded in the plant log. The operations supervisor also shall be notified of the job status and record pertinent information in the central control log.
- ✚ The reservoir entrance hatches shall be opened following the procedures and precautions necessary for various types of hatches requiring this preventative step. Protective barriers shall be properly placed.
- ✚ Ground fault protected lamps shall be installed to provide illumination. Lamps shall normally be installed through roof openings. If roof openings are not available, lamp installation shall



be delayed until the completion of the reservoir interior inspection.

- ✚ The reservoir interior requires inspection before allowing a work crew to enter. The responsible supervisor shall ensure that all necessary protective barriers, warnings and guards are in place and shall examine the structural condition of the reservoir, and determine the type and amount of work to be accomplished.
- ✚ The work to be performed inside the reservoir shall determine the type of protective equipment necessary to complete the task. All protective equipment and devices shall be on site ready for use prior to starting the project. Rubber boots, gloves and rain suits shall be used due to the conditions of the interior, and the type of cleaning procedures. Self-contained breathing apparatus, safety harness, lifeline and a retrieval system shall be on site and ready for emergency use on all reservoirs that do not have ground level access hatches. Pumps and blowers that are operated by internal combustion engines shall be set up away from hatches and air intakes to prevent the exhaust from entering the reservoir.
- ✚ The length of time worked and the length and frequency of rest periods shall be determined by the job supervisor, based on conditions inside of the reservoir.
- ✚ Only after the completion of the cleaning and removal of all equipment and personnel from the reservoir shall sterilization begin. Sterilization requires the use of chlorine compounds.
- ✚ When application of the sterilizing agents is complete, the tank will be filled and allowed to stand for twenty-four hours to ensure complete disinfection. This procedure is recorded in the plant log book and the operations supervisor engineer is also advised.
- ✚ After twenty-four hours, and after 3 bacterial samples have been approved, the tank will be filled with potable water. When returning the tank to service, the valve positions are recorded in the plant log book and the operations supervisor/engineer is notified.





CONFINED SPACE ENTRY PERMIT		1A. NAME OF EMERGENCY CONTACT		1B. TELEPHONE NUMBER	
2. SPECIFIC LOCATION OF SPACE		3. DESCRIPTION OF SPACE			
4. PURPOSE OF ENTRY		5. ENTRY		A. DATE	B. TIME
		6. EXIT		A. DATE	B. TIME
7A. NAME OF SUPERVISOR IN CHARGE OF WORK		7B. TELEPHONE NUMBER		8. NAME OF ENTRANT(S)	
9. NAME OF ATTENDANT		10. NAME OF CONFINED SPACE TESTER		11. WELDING OR "HOT WORK" REQUIRED <input type="checkbox"/> YES <input type="checkbox"/> NO	
12. CONFINED SPACE TEST DATA <small>List specific tests made. Entry is prohibited if reading outside standard permissible entry level (PEL).</small>					
A. SUBSTANCE TESTED	B. PERMISSIBLE LEVEL	C. READING	D. DATE	E. TIME	
OXYGEN (%)	>19.5 <22.0				
% OF LOWER EXPLOSIVE LIMIT	10%				
CARBON MONOXIDE	35 ppm				
13A. NAME OF INSTRUMENT(S)	13B. TYPE(S) OF INSTRUMENTS	13C. IDENTIFICATION NUMBER(S)	13D. WHEN LAST CALIBRATED		
14. SPECIAL REQUIREMENTS (Explain each "No" answer in Item 18)					
YES	NO	ITEM	YES	NO	ITEM
<input type="checkbox"/>	<input type="checkbox"/>	A. LOCKOUT - DE-ENERGIZE (Employee retains key)	<input type="checkbox"/>	<input type="checkbox"/>	I. FIRE EXTINGUISHER
<input type="checkbox"/>	<input type="checkbox"/>	B. SPACE PURGED	<input type="checkbox"/>	<input type="checkbox"/>	J. LIGHTING
<input type="checkbox"/>	<input type="checkbox"/>	C. VENTILATION	<input type="checkbox"/>	<input type="checkbox"/>	K. EMERGENCY TRIPOD
<input type="checkbox"/>	<input type="checkbox"/>	D. AREA SECURED	<input type="checkbox"/>	<input type="checkbox"/>	L. PROTECTIVE CLOTHING
<input type="checkbox"/>	<input type="checkbox"/>	E. BREATHING APPARATUS	<input type="checkbox"/>	<input type="checkbox"/>	M. LINE CAPPED OR BLANKED
<input type="checkbox"/>	<input type="checkbox"/>	F. RESUSCITATOR/INHALATOR	<input type="checkbox"/>	<input type="checkbox"/>	N. RESPIRATOR
<input type="checkbox"/>	<input type="checkbox"/>	G. ESCAPE HARNESS	<input type="checkbox"/>	<input type="checkbox"/>	O.
<input type="checkbox"/>	<input type="checkbox"/>	H. LIFELINE	<input type="checkbox"/>	<input type="checkbox"/>	P.
15. OTHER SPECIAL REQUIREMENTS (List each and status)					
16A. SPECIFIC PROTECTIVE CLOTHING AND EQUIPMENT REQUIRED					
16B. RESPIRATOR <input type="checkbox"/> NEG. PRESS. <input type="checkbox"/> SUPPLIED AIR <input type="checkbox"/> PAPR <input type="checkbox"/> SCBA					
17. COMMUNICATION PROCEDURES DURING ENTRY					
18. ADDITIONAL COMMENTS/REMARKS					
19. RESERVED FOR REGIONAL S&EM DIVISION BRANCH					
20. I CERTIFY THAT I HAVE READ AND UNDERSTOOD ALL OF THE REQUIREMENTS OF THE CONFINED SPACE ENTRY PROGRAM IMPLEMENTED BY MY GSA FACILITY MANAGER. FURTHERMORE, I WILL COMPLY WITH ALL OF THESE CRITERIA.					
ENTRANT SIGN AND DATE HERE		ATTENDANT SIGN AND DATE HERE			
21. I CERTIFY THAT ALL OF THE ABOVE INFORMATION IS CORRECT AND THE SPACE ENTRANT AND ATTENDANT ARE FULLY COMPETENT TO PERFORM WORK DESCRIBED IN THE ABOVE CONFINED SPACE.					
SUPERVISOR SIGN HERE					DATE

GENERAL SERVICES ADMINISTRATION

GSA FORM 3625 (10-91)



## INSTRUCTIONS

**SPECIAL NOTICE 1:** THE CONFINED SPACE ENTRY PERMIT IS NOT A PERMIT TO CONDUCT "HOT WORK" OPERATIONS THAT ARE COVERED UNDER THE PROVISIONS OF THE OSHA STANDARD 29 CFR 1910, SUBPART Q-WELDING, CUTTING AND BRAZING. FOR "HOT WORK" OPERATIONS, A SEPARATE PERMIT (GSA FORM 1755) IS REQUIRED. IF "HOT WORK" WILL BE REQUIRED IN CONJUNCTION WITH THE CONFINED SPACE ENTRY TASK, BOTH PERMITS (GSA FORM 1755 AND GSA FORM 3625) ARE REQUIRED.

**SPECIAL NOTICE 2:** CONFINED SPACE ENTRY IS PROHIBITED IF TEST DATA INDICATES AN UNSAFE OR UNHEALTHFUL CONDITIONS IS PRESENT IN ANY FORM OR QUANTITY. IN SUCH CASES, CONTACT THE REGIONAL SAFETY AND ENVIRONMENTAL MANAGEMENT DIVISION BRANCH FOR INSTRUCTIONS.

Item No.	Description
1:	List the EMERGENCY CONTACT (name and telephone number) in <b>BOLD</b> letters - the RED is preferred.
2:	List the specific location of the confined space.
3:	List the specific description of the confined space.
4:	List the specific reason that entry into the confined space is necessary.
5:	Show the date and the time entry into the confined space will be accomplished. If entry does not take place within 4 hours of schedule, breaks included, a new permit will be required. The permit shall be authorized for one-day entry only and for no more than 4 hours per day for each employee.
6:	Show the date and the time the confined space work is to be completed. If the work is not completed within one hour of the time shown, the entrant will be required to leave the space and explain the circumstances. If the work is to take more than two hours over the time shown, a new permit is required.
7A:	List the name of the supervisor in charge of the confined space. This individual must be available at all times while the confined space is occupied.
7B:	List the telephone number of the person listed in item 7A.
8:	List the name of the person entering the confined space. If more than one entrant is authorized, each individual shall be listed.
9:	List the name of the attendant.
10:	List the name of the person conducting confined space tests. If the tester is a contractor, a business card or other identification, and a copy of the contract specifying the contractor's responsibility should be attached to the form.
11:	If the response is "Yes", a completed copy of GSA Form 1755, Permit for Welding, Cutting or Brazing, must be posted next to the Confined Space Entry Permit, both of which must be in a conspicuous location outside the confined space.
12:	List the specific tests made and the purpose. As minimum, testing of oxygen, lower explosive limits, and carbon monoxide, must be accomplished. For other contaminants, the OSHA permissible exposure limits shall be used as the permissible entry limits.
13A:	List the instruments used for the tests. If more than one instrument is used, enter the required information on a separate sheet of paper and attach it to the form.
14:	Place an "X" in the appropriate box. If the response is "NO" to any item, the supervisor shall indicate the reason in item 18.
15:	The supervisor shall list any additional requirements or precautions necessary for the confined space entry. An example would be if testing is required every 30 minutes; or if monitoring is required at all times during space occupancy. If there are no additional requirements, the entry will so state this fact.
16A-16B:	List the specific protective clothing and equipment required for the task. Check the type of respiratory protective device: Neg. Press - negative pressure, PAPP - powered air purifying respirator, SCBA - self-contained breathing apparatus.
17:	State precisely what the communication procedures will be between the entrant and attendant during the confined space entry period.
18:	The supervisor shall list use this space to indicate any exceptions, negative responses in item 14, and any other remarks necessary to ensure a safe and healthful confined space entry task is accomplished.
19:	The regional S&EM office shall use this space to note any deficiencies on the entry permit or any other aspect of the facility confined space entry program. Positive corrective measures are to be noted in this item and the facility manager required to respond to any unfavorable comment.
20:	The entrant and attendant shall sign and date the form. They must sign on the date of entry into the confined space.
21:	The supervisor must sign and date the authorization for the confined space entry. The supervisor must sign on the date of entry. The supervisor shall not sign the form unless all items are completed. There shall not be any blank items allowed for items 1 through 17.

GSA FORM 3625 BACK (10-91)

**HAZARD COMMUNICATION:****CHEMICALS IN THE WORKPLACE:**

Chemical exposure may cause or contribute to many serious health effects such as heart ailments, kidney and lung damage, sterility, cancer, burns, and rashes. Some chemicals may also be safety hazards and have the potential to cause fires and explosions and other serious accidents.

Because of the seriousness of these safety and health problems, the Occupational Safety and Health Administration (OSHA) have issued a rule called "Hazard Communication." The basic goal of the standard is to be sure employers and employees know about work hazards and how to protect themselves. The Hazard Communication Standard establishes uniform requirements to make sure that the hazards of all chemicals imported into, produced, or used at Jabal-e-Omar project are evaluated, and that this hazard information is transmitted to affected working staff/employees.

**HAZARD EVALUATION:**

The quality of the hazard communication program will depend on the adequacy and accuracy of the hazard assessment. Chemical manufacturers and importers will be required to review available scientific evidence concerning the hazards of the chemicals they produce or import.

**WRITTEN HAZARD COMMUNICATION PROGRAM:**

SBG O & M team will develop, implement, and maintain at the workplace a written, comprehensive hazard communication program that will include provisions for container labelling, collection and availability of material safety data sheets, and an employee training program. It will also contain a list of the hazardous chemicals in each work area and the hazards associated with chemicals in unlabelled pipes.

The written program will not be lengthy or complicated, and employees will be able to rely on existing hazard communication programs to comply with the above requirements. The written program will be available to employees, their designated representatives.

**MATERIAL SAFETY DATA SHEETS:**

Chemical manufacturers and importers will must develop an MSDS for each hazardous chemical they produce or import at the project, and must provide the MSDS automatically at the time of the initial shipment of a hazardous chemical to a downstream distributor or user. Distributors must also ensure that clients at Jabal-e-Omar project are similarly provided an MSDS.

Each MSDS must be in English/Arabic and include information regarding the specific chemical identity of the hazardous chemical(s) involved and the common names. In addition, information must be provided on the physical and chemical characteristics of the hazardous chemical; known acute and chronic health effects and related health information; exposure limits, precautionary measures; emergency and first-aid procedures.

**EMPLOYEE INFORMATION AND TRAINING:**

SBG O & M Team have already established a training and information program for working staff/employees exposed to hazardous chemicals in their work area at the time of initial assignment and whenever a new hazard is introduced into their work area.

**FIRST AID PROCEDURES:****BASIC CLEANLINESS AND PROTECTION:**

When a person is hurt, the most important thing is to help. But you also must protect yourself from other blood-borne diseases. Following procedures will be adopted when someone is bleeding:

1. If possible, show the injured person how to stop the bleeding themselves, by applying direct pressure on the wound.
2. If they cannot do this, keep the blood off yourself by wearing gloves or a clean plastic bag on your hands, and placing a clean, thick cloth directly over the wound before applying pressure.

Avoid objects soiled with blood. Be careful not to prick yourself with needles or other sharp objects around the person you are helping. Cover cuts or other wounds with dry, clean bandages to protect them.

Be especially careful when you (SSCL Team) have to provide first aid where there are many people wounded from an accident.

If you do get blood or other body fluids on you, wash your hands with soap and water as soon as possible. If other parts of your body were touched by body fluids (especially your eyes), wash them thoroughly with lots of water.

**SHOCK:**

Shock is a life threatening condition that can result from a large burn, losing a lot of blood, severe illnesses, dehydration, or severe allergic reaction. Heavy bleeding inside the body—although not seen—can also cause shock.

**SIGNS OF SHOCK:**

- Weak, rapid pulse (more than 100 per minute)
- 'Cold sweat'; pale, cold, damp skin
- Blood pressure drops dangerously low
- Mental confusion, weakness, or loss of consciousness



## WHAT TO DO TO PREVENT OR TREAT SHOCK?

At the first sign of shock, or if there is risk of shock . . .

- Loosen any belts or tight clothing the person may be wearing.
- Have the person lie down with his feet a little higher than his head
- If he has a severe head injury, put him in a 'half sitting' position
- Stop any bleeding. Use gloves or a plastic bag to keep the blood off your hands.
- If the person feels cold, cover him with a blanket.
- If he is conscious and able to drink, give him sips of water or other drinks. If he looks dehydrated, give a lot of liquid, and Rehydration Drink If he does not respond quickly, give intravenous fluids if you know how.
- Treat his wounds, if he has any.
- Keep calm, reassure the person, and seek medical help.
- If the person is unconscious:  
Lay him on his side with his head low. If he seems to be choking, pull his tongue forward with your finger.
- If he has vomited, clear his mouth immediately. Be sure his head is low, tilted back, and to one side so he does not breathe vomit into his lungs.
- If he has a neck or spine injury, do not tilt his head or move his back.
- Do not give him anything by mouth until he becomes conscious.
- Seek medical help fast.

## HOW TO MOVE A BADLY INJURED PERSON?

- If the neck is injured or broken, put tightly folded clothing or sandbags on each side of the head to keep it from moving.
- When carrying, try to keep the feet up, even on hills. Tightly folded clothing
- Have another person put the stretcher in place.
- With the help of everyone, place the injured person carefully on the stretcher.
- With great care, lift the injured person without bending him anywhere. Take special care that the head and neck do not bend.

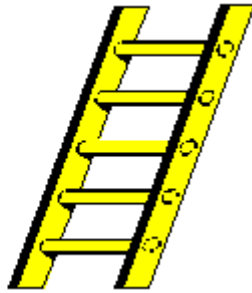
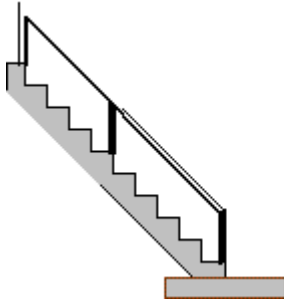
### CAUTION:

- ✓ Never rub or massage a sprain or broken bone.
- ✓ Never rub or massage a broken limb or a limb that may possibly be broken.
- ✓ Never put the bone back into the wound until the wound and the bone are absolutely clean.
- ✓ It is possible to do a lot of damage while trying to set a bone. Ideally, it should be done with the help of someone with experience. Do not jerk or force.
- ✓ Seek medical help immediately.



## STAIRWAYS AND LADDERS OPERATING PROCEDURES:

### INTRODUCTION:



OSHA estimates that there are 24,882 injuries and as many as 36 fatalities per year due to falls from stairways and ladders. Nearly half of these injuries are serious enough to require time off the job--11,570 lost workday injuries and 13,312 non-lost workday injuries occur annually due to falls from stairways and ladders used in construction. These data demonstrate that work on and around ladders and stairways is hazardous. More

importantly, they show that compliance with OSHA's requirements for the safe use of ladders and stairways could have prevented many of these injuries.

### SCOPE AND APPLICATION:

The OSHA rules apply to all stairways and ladders used in construction, alteration, repair (including painting and decorating), and demolition of work sites covered by OSHA's construction safety and health standards. They also specify when stairways and ladders must be provided. They do not apply to ladders that are specifically manufactured for scaffold access and egress, but do apply to job-made and manufactured portable ladders intended for general purpose use and which are then used for scaffold access and egress.

### GENERAL REQUIREMENTS:

- A stairway or ladder must be provided at all worker points of access where there is a break in elevation of 19 inches (48 cm) or more and no ramp, runway, embankment, or personnel hoist is provided.
- When there is only one point of access between levels, it must be kept clear to permit free passage by workers. If free passage becomes restricted, a second point of access must be provided and used.
- When there are more than two points of access between levels, at least one point of access must be kept clear.
- All stairway and ladder fall protection systems required by these rules must be installed and all duties required by the stairway and ladder rules must be performed before employees begin work that requires them to use stairways or ladders and their respective fall protection systems.



**STAIRWAYS:**

The following general requirements apply to all stairways, as indicated:

- Stairways that will not be a permanent part of the structure on which construction work is performed must have landings at least 30 inches deep and 22 inches wide (76 x 56 cm) at every 12 feet (3.7 m) or less of vertical rise.
- Stairways must be installed at least 30 degrees, and no more than 50 degrees, from the horizontal.
- Variations in riser height or stair tread depth must not exceed 1/4 inch in any stairway system, including any foundation structure used as one or more treads of the stairs.
- Where doors or gates open directly onto a stairway, a platform must be provided that is at least 20 inches (51 cm) in width beyond the swing of the door.
- Metal pan landings and metal pan treads must be secured in place before filling.
- All stairway parts must be free of dangerous projections such as protruding nails.
- Slippery conditions on stairways must be corrected.
- Spiral stairways that will not be a permanent part of the structure may not be used by workers.

**LADDERS:**

The following general requirements apply to all ladders, including job-made ladders:

- A double-cleated ladder or two or more ladders must be provided when ladders are the only way to enter or exit a work area having 25 or more employees, or when a ladder serves simultaneous two-way traffic.
- Ladder rungs, cleats, and steps must be parallel, level, and uniformly spaced when the ladder is in position for use.
- Rungs, cleats, and steps of portable and fixed ladders (except as provided below) must not be spaced less than 10 inches (25 cm) apart, nor more than 14 inches (36 cm) apart, along the ladder's side rails.
- Rungs, cleats, and steps of step stools must not be less than 8 inches (20 cm) apart, nor more than 12 inches (31 cm) apart, between centre lines of the rungs, cleats, and steps.
- Rungs, cleats, and steps at the base section of extension trestle ladders must not be less than 8 inches (20 cm) nor more than 18 inches (46 cm) apart, between centre lines of the rungs, cleats, and steps. The rung spacing on the extension section must not be less than 6 inches (15 cm) nor more than 12 inches (31 cm).
- Ladders must not be tied or fastened together to create longer sections unless they are specifically designed for such use.
- A metal spreader or locking device must be provided on each stepladder to hold the front and back sections in an open position when the ladder is being used.
- When splicing side rails, the resulting side rail must be equivalent in strength to a one-piece side rail made of the same material.
- Two or more separate ladders used to reach an elevated work area must be offset with a platform or landing between the ladders, except when portable ladders are used to gain access to fixed ladders.
- Ladder components must be surfaced to prevent injury from punctures or lacerations, and prevent snagging of clothing.





- Wood ladders must not be coated with any opaque covering, except for identification or warning labels which may be placed only on one face of a side rail.

#### **LADDER SAFETY DEVICES AND RELATED SUPPORT SYSTEMS FOR FIXED LADDERS:**

- All safety devices must be capable of withstanding, without failure, a drop test consisting of a 500-pound weight (226 kg) dropping 18 inches (41 cm).
- All safety devices must permit the worker to ascend or descend without continually having to hold, push, or pull any part of the device, leaving both hands free for climbing.
- All safety devices must be activated within 2 feet (.61 m) after a fall occurs, and limit the descending velocity of an employee to 7 feet/second (2.1 m/sec) or less.
- The connection between the carrier or lifeline and the point of attachment to the body belt or harness must not exceed 9 inches (23 cm) in length.

#### **MOUNTING LADDER SAFETY DEVICES FOR FIXED LADDERS:**

- Mountings for rigid carriers must be attached at each end of the carrier, with intermediate mountings, spaced along the entire length of the carrier, to provide the necessary strength to stop workers' falls.
- Mountings for flexible carriers must be attached at each end of the carrier. Cable guides for flexible carriers must be installed with spacing between 25 feet (7.6 m) and 40 feet (12.2 m) along the entire length of the carrier, to prevent wind damage to the system.
- The design and installation of mountings and cable guides must not reduce the strength of the ladder.
- Side rails, and steps or rungs for side-step fixed ladders must be continuous in extension.

#### **COMPRESSED GAS CYLINDER OPERATING PROCEDURES:**

Due to the nature of gas cylinders, special storage and handling precautions are necessary. The hazards associated with compressed gases include oxygen displacement, explosion hazards, toxic effect of some gases, as well as the physical hazards of a ruptured cylinder. There are almost 200 different types of materials in gas cylinders including atmospheric gases, fuel gases, refrigerant gases, poison gases and miscellaneous gases. Compressed gases are usually divided into six basic categories, with some gases falling into more than one classification. The categories are as follows:

- Flammable Gases
- Oxygen and Oxidizing Gases - Acid and Alkaline Gases - Highly Toxic Gases
- Cryogenic Liquefied Gases - Inert Gases

A sudden release of these gases can cause a cylinder to become a missile-like projectile, destroying everything in its path. Cylinders have been known to penetrate concrete-block walls. To prevent such a dangerous situation, there are several general procedures to follow for safe storage and handling of a compressed gas cylinder:

**IDENTIFICATION OF CONTENTS OF COMPRESSED GAS CYLINDERS:**

- A. The contents of any compressed gas cylinder should be identified clearly so as to be easily, quickly, and completely determined by any laboratory worker.



- B. A durable label should be provided that cannot be removed from the compressed gas cylinder.
- C. No compressed gas cylinder should be accepted for use that does not identify its contents legibly by name.
- D. Color-coding is not a reliable means of identification; cylinder colours vary from supplier to supplier, and labels on caps have no value because many caps are interchangeable.
- E. Tags should be attached to the gas cylinders on which the names of the users and dates of use can be entered.
- F. If the labelling on the gas cylinder becomes unclear or defaced so that the contents cannot be identified, the cylinder should be marked "contents unknown" and the manufacturer contacted regarding appropriate procedures.

**TRANSPORTING GAS CYLINDERS:**

- A. Cylinders transported by truck must be fastened securely in an upright position so that they will not fall or strike each other.
- B. Cylinders should not be transported without safety caps. A cylinder's cap should be screwed all the way down on the cylinder's neck ring and should fit securely. Do not lift cylinders by the cap. The cap is for valve protection only.
- C. Cylinders should not be transported with the regulator attached to the cylinder.
- D. Always use a cylinder cart to move compressed gas cylinders. Refrain from sliding, dragging or rolling cylinders on edge.
- E. Only one cylinder should be handled (moved) at a time.



## STORAGE OF COMPRESSED GAS CYLINDERS:



- A. Cylinders should not be allowed to drop nor be struck violently.
- B. Cylinders should be properly secured at all times whether attached to a wall, cylinder truck, cylinder rack, or post.
- C. Liquefied flammable gas cylinders should be stored in an upright position or such that the pressure relief valve is in direct communication with the vapour space of the cylinder.
- D. Caps used for valve protection should be kept on the cylinders at all times except when the cylinder is actually being used or charged.
- E. Cylinders should not be used for rolling, supports, or any purpose other than the transportation and supply of gas.
- F. Cylinders should be stored in a well-ventilated area away from flames, sparks, or any source of heat or ignition. Keep cylinders away from electrical circuits.
- G. Cylinders should not be exposed to an open flame or to any temperature above 125 degrees F.
- H. Oxygen cylinders (empty or full) in storage should be separated from fuel-gas cylinders and combustible materials by a minimum distance of 20 feet or by a barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.
- I. Flammable gas cylinders should not be stored with oxygen or nitrous oxide cylinders or adjacent to oxygen charging facilities.
- J. Full and empty cylinders of all gases should be stored separately and identified by signs to prevent confusion.
- K. Cylinders may be stored outdoors but should be protected from the ground to prevent bottom corrosion. Where extreme temperatures prevail, cylinders should be stored so they are protected



from the direct rays of the sun.





- L. Cylinders should not be exposed to continuous dampness, stored near salt or other corrosive chemicals or fumes. Corrosion may damage cylinders and cause their valve protection caps to stick.
- M. Do not charge, ship, or use any cylinder which is not provided with a legible decal that identifies its contents.

#### **THINGS NOT TO DO:**

- A. Never roll a cylinder to move it.
- B. Never carry a cylinder by the valve.
- C. Never leave an open cylinder unattended.
- D. Never leave a cylinder unsecured.
- E. Never force improper attachments on to the wrong cylinder.
- F. Never grease or oil the regulator, valve, or fittings of an oxygen cylinder.
- G. Never refill a cylinder.
- H. Never use a flame to locate gas leaks.
- I. Never attempt to mix gases in a cylinder.
- J. Never discard pressurized cylinders in the normal trash.





#### **SAFETY COMMITTEE:**

SBG O & M will form a safety committee which will consist of following members:-

-  Safety Consultant
-  Safety Coordinator
-  Safety Inspector
-  1 Supervisor of every department working in the project

#### **SAFETY COMMITTEE ACTION PLAN:**

Following will be the action plan of safety committee:-

-  Safety committee members will meet once in a month.
-  Committee members will make safety inspections in their area of concern and will present the identified hazards in the meeting and will suggest solutions.
-  All the minutes of the meeting will be shared with safety department and site management
-  Safety committee will ensure implementation of safety department instructions and safe working



procedures developed in the policy of the company.

- ✚ Committee will identify the training needs inside the respective departments and will inform the management for arrangements of such training to the targeted manpower.
- ✚ Will answer to the objections raised by the safety department on non-compliance with the procedures.
- ✚ Will assure the application of laid safety rules and regulations as per preventive maintenance instruction systems.
- ✚ Will establish a mechanism to inspect and supervise the activities of contractors as per safety rules.
- ✚ Will establish a system to penalize the non-compliance parties.

### **MSDS USE & TRAINING**

Following departments of SBG O & M at DOKAAE are using materials / chemical in different forms:-

- ✚ Civil Department – Paints, Cements, Glues, tiles etc...
- ✚ Housekeeping Department – Detergents & Cleaning Agents, cleaning solutions, soaps
- ✚ Stores Department – Materials / Chemical Handling
- ✚ Stationery Store – Printer ink powder, glues, papers, etc...
- ✚ Electrical Store – Cleaning solutions for panel board cleaning, Sand papers
- ✚ Mechanical Store – Rust removers, sand papers etc...



## What is MSDS?

An MSDS is the abbreviation of **Material Safety Data Sheet**. This document comes with any material and contains different type of information related to the material the MSDS is supplied with.

## What is inside MSDS?

### **Product Identification**

Provide general identification of the chemicals e.g. Synonyms, CAS No., Molecular Weight, Chemical Formula, Product Codes (if applicable)

### **Composition / Information on Ingredient**

Provide the percentage or concentration of the chemical. Some may provide additional hazardous information such as PEL (Permissible Exposure Limit), TLV (Threshold Limit Value) etc. Therefore, the seriousness of the chemicals can be referred.

### **Hazards Identification**

Provide the degree of hazard with reference to:

 Health rating

 Flammability rating

 Reactivity rating





 Contact rating

Additional information may include the potential health effects and symptom through inhalation, ingestion, dermal contact, eye contact, chronic exposure & aggravation of pre-existing conditions (if applicable)



## **First Aid Measures**

To provide first aid attention, prior to the arrival of physician when accident takes place. The piece of information provided may refer to the chemical accident due to:

-  Inhalation
-  Ingestion
-  Dermal Contact
-  Eye Contact

## **Fire Fighting Measures**





Provide details on the *Flash point*, *Auto Ignition Temperature*, *Flammability* of the chemical product and *Explosion capability* information. Additional information may inclusive of the proper methods of using *fire extinguishing media* (*dry chemical, foam, water or carbon dioxide*) and type of suitable *fire fighting protective clothing* used during fire emergency

## **Accidental Release Measures**

Provide some essential guideline to deal with for instance how to deal with chemical spillage, ventilation provision, contain and recover liquid when spilled etc.

## **Handling & Storage**



Provide detail to conduct, handling and storing at a safer way. These may include:

-  How to protect the chemical?
-  How to store the chemicals (environment factors consideration)?
-  Is it compatible with other chemicals when stored together?
-  How to use it at a safer way?











### **Exposure Controls/ Personal Protection**

Provide details how to control the exposure of employees at the workplace when using such chemical, for example:

-  Ventilation system
-  PPE (Respirator, safety goggle, glove, SCBA, apron etc) for skin, eye and other bodily related protection




### **Physical / Chemical Properties**

Provide detail of some of properties of chemical, for instance:-

-  Appearance (clear, colourless, milky etc)
-  Odour (type of “smell” of product)
-  Solubility (Water soluble, slight solubility etc)
-  pH
-  Boiling point, melting point (°C or F)
-  Vapour density
-  Vapour pressure
-  Evaporation rate

### **Stability & Reactivity**

Provide some details on:-

-  Stability and reactivity of the chemical (e.g. during storage)
-  Type of hazardous decomposition products (e.g. release of certain gases such as CO<sub>2</sub> when heated)
-  Compatibilities with other chemicals (for example acrylic acid is incompatible with strong





oxidizing agents)

#### **Toxicological Information**

This section may refer to the toxicity of the chemical with reference to the *LD 50* and *LC 50*. The lower the value of the LC the more hazardous will be the chemical

#### **Ecological Information**

Provide some detail on ecological impact of the chemical when it is used or discharged to the air, water or soil. Therefore, the user could take some precautions or probably engineering control when deal with this chemical

#### **Disposal Considerations**

Applied for the chemical that couldn't be recycled, saved or recovered and is considered as hazardous waste. (Must comply with local requirements)

#### **Transport Information**


Provide some detail on the identification during transportation of chemical for both domestic and international purposes

#### **Regulatory Information**


Provide some details of the regulatory information from different relevant countries. Additional item would be the inclusive of *Hazchem Code* from Australia.

#### **Other Information**

Provide certain information on for example:-

 NFPA rating in term of health, flammability and reactivity rating.

 Label hazard warning. (E.g. ***DANGER! MAY BE FATAL IF SWALLOWED***)

 Label pre-cautious. (E.g. ***Do not breathe vapour or mist***)



- ✚ Label of first aid. (E.g. ***Do not induce vomiting, give large plenty of water***)
- ✚ Product use (if applicable)

## HOW DO I READ A MATERIAL SAFETY DATA SHEET (MSDS)?

In addition to giving information about the nature of a chemical, an MSDS also tells how to work safely with a chemical and what to do if there is an accidental spill.

### Who is responsible for issuing a Material Safety Data Sheet (MSDS)?

The Federal Occupational Safety and Health Administration (OSHA) Hazard Communication Standard requires manufacturers or distributors of chemicals to issue Material Safety Data Sheets (MSDSs) with the first shipment of any hazardous chemical product, and the employer is responsible for having them available for you.

### For whom are Material Safety Data Sheets (MSDSs)?

They are designed for following parties:-

- ✚ workers who may be exposed to hazardous materials
- ✚ Emergency personnel (for example, fire-fighters)
- ✚ Who may have to clean up a spill or release?

### For whom are Material Safety Data Sheets (MSDSs)?

MSDSs must contain the same basic kinds of information, such as

- ✚ Chemical Identity: Name of the product.
- ✚ Manufacturer's Information: Name, address, phone number and emergency phone number of the manufacturer.
- ✚ Hazardous Ingredients/Identity Information: List of hazardous chemicals.
- ✚ Depending on the state, the list may contain all chemicals even if they are not hazardous, or only



those chemicals which have OSHA standards.

- ✚ Since chemicals are often known by different names, all common (trade) names should be listed.  
The OSHA Permissible Exposure Limit (PEL) for each hazardous ingredient must be listed.
- ✚ Physical/Chemical Characteristics: Boiling point, vapour pressure and density, melting point, evaporation rate, etc.
- ✚ Fire and Explosion Hazard Data: Flash point, flammability limits, ways to extinguish, special fire fighting procedures, unusual fire and explosion hazards.
- ✚ Reactivity Data: How certain materials react with others when mixed or stored together.
- ✚ Health Hazard Data: Health effects (acute= immediate; chronic= long-term), ways the hazard can enter the body (lungs, skin or mouth), symptoms of exposure, emergency and first aid procedures.
- ✚ Precautions of Safe Handling and Use: What to do in case materials spill or leak, how to dispose of waste safely, how to handle and store materials in a safe manner.
- ✚ Control Measures: Ventilation (local, general, etc.), type of respirator/filter to use, protective gloves, clothing and equipment, etc.

### **Where can I get Material Safety Data Sheets (MSDSs)?**

If you are:-

- ✚ At your workplace: All workers must have easy access to them.
- ✚ The employer must request them from the distributor that sold the materials.
- ✚ Workers can also request them.
- ✚ The Internet offers free resources and information on MSDSs, as well.
- ✚ Your union may have MSDSs also.

**SAMPLE MSDS:****440-R® SMT DETERGENT**  
**MATERIAS SAFETY DATA SHEET (MSDS)****SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

Product Name: 440-R SMT Detergent

Manufacturer: SMT Detergent Corp.  
4607 Lakeview Canyon Rd. #264  
Westlake Village, CA 91361  
U.S.A.

Telephone Number: +1(818) 707-3110  
Fax Number: +1(818) 707-3117  
Web Site: <http://www.SMTdetergent.com>

**SECTION 2: COMPOSITION / INFORMATION ON INGREDIENTS**

Hazardous Components: None

**SECTION 3: HAZARDOUS IDENTIFICATION**

Main Hazard: Slightly irritating to skin and eyes

Routes of entry: Inhalation: Yes      Skin contact: Yes  
Skin absorption: Yes      Ingestion: Yes

Potential health effects: Inhalation in concentrated form may cause headache and irritation of the upper respiratory tract. Can cause irritation, burning and redness to eyes. Brief contact should not produce harmful effects. Prolonged contact may cause irritation or burning. Ingestion can cause nausea, vomiting and diarrhea.

**SECTION 4: FIRST AID MEASURES**

Eyes: Wash eyes with large amounts of water for at least 15 minutes occasionally lifting upper and lower lids. Get medical attention.

Skin: Wash contaminated skin with soap and large amounts of water. Remove clothing and footwear and wash before reuse.

Inhalation: Remove to fresh air. Flush mouth and nasal passages thoroughly with water. Get medical attention. Administer oxygen if necessary.

Ingestion: Do not induce vomiting. Drink milk, follow with diluted vinegar. Seek medical attention.

MSDS: 440-R SMT Detergent

**SECTION 5: FIRE FIGHTING MEASURES**

Flash point (TCC):	None to boiling
Flammable Limits in Air:	Upper limit = No data, Lower limit: = No data
General Hazard:	None
Fire Fighting:	Fire fighters have eye protection and wear self-contained breathing apparatus
Extinguishing Media:	Carbon Dioxide, chemical foam, water fog
Decomposition Products Under Fire Conditions:	None known
Unusual Fire and Explosion Hazards:	None known

**SECTION 6: ACCIDENTAL RELEASE MEASURES**

Material Release or Spill:	Contain the spill. Absorb small spills with sand, dirt or clay. Large spills may be pumped into containers for recovery or disposal. Flush residue with plenty of water. Avoid wash water entering natural waterways or public water supplies. Neutralize with dilute acid.
----------------------------	---

**SECTION 7: HANDLING AND STORAGE**

Handling and Storage:	Wear eye protection, launder contaminated clothing before reuse. Store drums in a cool place, bung up and closed tightly.
-----------------------	---

**SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION**

Personal Protection:	Code "B": Safety glasses and gloves.
Respiratory Protection:	None normally required. Use NIOSH approved dust mask if working with mist.
Ventilation:	Adequate.
Protective Gloves:	Rubber or neoprene.
Eye Protection:	Chemical splash goggles.
Other Protective Clothing or Equipment:	Wear protective clothing to prevent skin contact. Wash hands with soap and water after handling.
Exposure Guidelines:	None established for product as a whole

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

Appearance:	Clear purple liquid
Odor:	Mild and pleasant
Boiling Point:	102° Celsius (Approx.)
Vapor Pressure:	<1
Solubility in Water:	Complete
Specific Gravity:	1.08
pH	12.4 (concentrate)

*MSDS: 440-R SMT Detergent*

**SECTION 10: STABILITY AND REACTIVITY**

Stability:	Stable under normal conditions
Hazardous Polymerization:	Will not occur
Incompatible Materials:	Strong oxidizing agents
Conditions to avoid:	None known
Hazardous Decomposition Products:	None known

**SECTION 11: TOXICOLOGICAL INFORMATION**

Health Hazards (Acute and Subchronic):	May be irritating to skin and eyes.
Health Hazards (Chronic)	No subchronic effects expected at industrial use levels when good personal hygiene practices are followed.
Mutagenicity:	No data available

**SECTION 12: ECOLOGICAL INFORMATION**

Mobility:	Will dissolve completely in water
Degradability:	This product is readily biodegradable
Bio-accumulation:	No data available
Ecotoxicity:	None known
RoHS & REACH	Compliant

**SECTION 13: DISPOSAL CONSIDERATIONS**

Disposal of Material:	Waste must be disposed of in accordance with government environmental control regulations. This material is not a U.S. EPA hazardous waste.
-----------------------	---

**SECTION 14: TRANSPORT INFORMATION**

U.S. D.O.T. Shipping Name:	Compound, Cleaning Liquid
U.S. D.O.T. Hazardous Class:	None
U.N. / N.A. Number:	None
U.S. D.O.T. Label:	None

*MSDS: 440-R SMT Detergent*



**SECTION 15: REGULATORY INFORMATION**

Label Information:	X - Irritant
Risk Phases	R36/38 Irritating to eyes & skin, S25 Avoid contact with eyes, S26 In case contact with eyes, rinse immediately with plenty of water and seek medical advice.
Safety Phases:	S2 Keep out of reach of children S39 Wear eye/face protection
EC Annex 1 Classification:	None
Regulations / References:	Refer to the requirements of all relevant local regulations

**SECTION 16: OTHER INFORMATION**

NFPA Rating:	H = 1, F = 0, R = 0
Effective Date:	1 May 2005
Sections Revised:	All, new format

This material safety data sheet adheres to ANSI standard ANSI Z400.1-1993

RoHS Compliant. 440-R SMT Detergent is compliant with the European Rules 91/155/CEE, 2001/58/EC, 2001/118/EC.

This product does not contain any ozone depleting chemicals or VOCs.

440-R SMT Detergent has been Certified Environmentally Safe and User Safe by the California Environmental Protection Agency and Verified by the U.S. EPA as part of the Environmental Technology Verification (ETV) Program.

This product has been Certified as a Clean Air Solvent (CAS) by California's South Coast Air Quality Management District (AQMD)

This product does not contain SARA Section 313 reportable compounds.

All ingredients are listed on the TSCA Inventory.

Does not contain any chemicals which require warning under California Proposition 65 or the Michigan Critical Materials Register.

The data contained is based on information currently available to SMT Detergent Corp. (SDC) and is believed to be factual. SDC does not manufacture the raw materials used in this product and correspondingly relies on information provided to SDC from material safety data sheets on the specific raw materials in the construction of this material safety data sheet. Such information is, to the best of SDC's knowledge and belief, accurate and reliable as of the date of this MSDS. HOWEVER, NO REPRESENTATION, WARRANTY OR GUARANTEE IS MADE AS TO THE ACCURACY, RELIABILITY, OR COMPLETENESS OF THIS DOCUMENT. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular application. This information is not intended to be all-inclusive as of the manner and conditions of use, handling and storage. Other factors may involve other or additional safety or performance considerations. This data is not to be taken as a warranty or representation of which SDC assumes legal responsibility.

Additional information is available on the SMT Detergent Web Site: <http://www.SMTdetergent.com>

MSDS: 440-R SMT Detergent



MSDS will be obtained from manufacturers and will be displayed in the stores and workshops and visible places to be viewed by workers.

All the personnel engaged in the handling of such materials will be provided with training on the following:-

- ✚ What is MSDS?
- ✚ Purpose of MSDS
- ✚ How to read the special symbols and caution signs on the MSDS?
- ✚ Properties of the chemical
- ✚ Precautionary measures while using and handling
- ✚ Actions in case of exposure
- ✚ First aid in case of exposure to hazardous chemicals / materials.

Training plan will be developed after getting the shift information from the concerned departments.