PROCEDURES
PREVENTION OF ACCIDENTAL IGNITION

6.0 PURPOSE (192.751)

All possible precautions shall be exercised to prevent the accidental escape and ignition of gas. Whenever possible, potential sources of ignition should be eliminated prior to the commencement of work.

6.1 SCOPE

A. Escaping Gas
B. Leak Repair
C. Static Electricity
D. No Smoking
E. Combustible Atmosphere
F. Preventing Air from Entering

6.2 ESCAPING GAS HAZARDS AND PREVENTION OF IGNITION

Escaping gas may follow a ditch or excavation for an appreciable distance if air currents are favorable, or if gas is blowing directly up at the ditch or excavation. The public must be kept a safe distance at all times even if the area must be roped off in order to do so. The following procedures are observed where sources of ignition may be involved:

A. Post warning signs as appropriate, provide a fire extinguisher and remove all potential sources of ignition from the area when the presence of gas or the proposed venting of gas into the air may create a hazard of fire or explosion.

B. Do not turn on electrical circuits, including flashlights not approved for a gaseous atmosphere, in an area where gas is present. Electrical tools, cords, and generators used with plastic fusion may also considered possible sources of ignition.

C. Do not weld or gas cut pipe or other facilities containing a combustible mixture of gas in air. This does not prohibit the "Fire Controlled" tie-in method. This method allows the welding operation to go on while gas is present at slightly higher than atmospheric pressure.

D. Precautions against possible ignition from static electricity in gaseous atmosphere are taken when work with plastic pipe is performed, i.e., purging operations, leak repairs or with broken or damaged lines.
PROCEDURES
PREVENTION OF ACCIDENTAL IGNITION

E. Use only lighting equipment approved for use in a gaseous atmosphere, including flashlights, in or adjacent to an area of possible ignition.

F. Do not use open flames of any kind for the purpose of detecting and/or localizing gas leakage or suspected gas leakage in mains or services under any circumstances. Use combustible gas indicators and/or soap bubble testing to detect and/or localize leakage.

G. The practice of "flashing" bell holes before entering them for the purpose of welding, etc. When flashing, do not flash bell holes containing plastic piping under pressure. Use a combustible gas indicator to detect gas leakage.

6.2 LEAK REPAIR PROCEDURES

A. Location of Vehicle

Park Utility vehicles a safe distance from the leak. If wind is present, always park upwind from the leak.

B. Warning the Public

"No Smoking" signs, barricades and caution tape shall be posted (220 linear feet around the site). When on or near a public roadway, personnel shall be stationed on both sides of the restricted area to stop vehicles and to warn the public. They shall use red flags during the day and electric trouble lights at night.

C. If the leak is major and is near a residence or business establishment occupants shall be contacted immediately and warned to extinguish all fires.

D. Prepare for an Emergency

Evaluate the situation. Be prepared for the worst before starting to repair even minor leaks. Check location of available valves, and work out any necessary shutdown and rerouting procedures.

E. Have Tools and Supplies Ready
PROCEDURES
PREVENTION OF ACCIDENTAL IGNITION

Have the right tools and materials on the job before the leak is uncovered. Be sure the clamps, bolts, nuts, wrenches and other items are ready and in a handy and safe place. Be sure all threads are clean, oiled and in good condition.

F. Take Steps to Prevent Fire

Extinguish or move to safe distance all possible sources of ignition. Matches, cigarette lighters, friction lighter, etc., shall be left in the truck.

G. Reduce Pressure

When making repairs on high-pressure lines, gas pressure may be reduced as authorized by your supervisor.

H. Prevent Sparks

When using picks and shovels, be extremely careful to prevent striking sparks.

I. Protect the Eyes

Wear approved eye protection when excavating around the pipe, as well as when actually repairing the leak.

J. Excavating

Make the excavation large enough for ample working room around the pipe. Do not disturb the dirt covering the actual leak until the very last. This will minimize the amount of digging to be done while the leak is blowing.

K. Stay Clear of Gas

Always stay clear of a blowing stream of gas. Stand behind or to one side of the stream.

L. Signaling

Have prearranged signals to direct work in repairing a break or leak. The noise from
PROCEDURES
PREVENTION OF ACCIDENTAL IGNITION

a high-pressure leak makes hearing extremely difficult. Use approved ear protection when working on a high-pressure leak.

M. Number of Employees

The severity of the leak or line break will determine the number of employees required to safely control escaping gas. No person shall enter a gaseous atmosphere in a confined space without another person outside of the confined space.

N. Fire Extinguishers

A minimum of one 20-pound, dry chemical fire extinguisher, ABC, shall be kept in readiness while repairing a line break, making a tap on a hot line, during welding processes, or where any possible escape of natural gas and source of ignition might occur. Before work begins, the employee in charge shall designate one qualified individual to be responsible for the fire extinguisher.

Procedure for using portable extinguisher:
1. Pull the pin
2. Aim low
3. Squeeze
4. Sweep side to side and upward

If gas is ignited decide as to whether to extinguish the fire or let it burn based on public safety

O. Methods of Gas Flow Control

1. The following methods may be used to control gas flow:
   (a) In-line valves.
   (b) Pressure control (line stopper) fitting.
   (c) Pipe squeezing.
   (d) Repair clamps.
PROCEDURES
PREVENTION OF ACCIDENTAL IGNITION

(e) Expansion plug.

2. When determining what type of flow control to use in an emergency, good judgment shall be exercised to avoid entering a gaseous atmosphere whenever practical. Emphasis shall be placed on customer and employee safety when determining flow control. No person shall enter a gaseous atmosphere in a confined space without proper safety equipment including breathing apparatus, and another person outside of the confined space.

6.3 STATIC ELECTRICITY

Polyethylene plastic pipe does not readily conduct electricity however a static electric charge can build up on inside and outside surfaces, and stay on the pipe surface until some grounding device such as a tool or a person comes close enough for the static electricity to discharge to the grounding device.

Discharging one part of the pipe surface will not affect other charged areas because static electricity does not flow readily from one area to another. Polyethylene pipe cannot be discharged by attaching normal grounding wires to the pipe.

A static electricity discharge to a person, a tool, or a grounded object close to the pipe surface can cause an electric shock or a spark that can ignite a flammable gas or combustible dust atmosphere causing fire or explosion.

Precautions against possible ignition from static electricity in a gaseous atmosphere shall be taken prior to performing the work.

A. Plastic Pipe: A wetting agent on the surface of the pipe provides a conductive path to rapidly diffuse static electricity.

1. The rags or burlap must remain wet with soapy solution during the entire operation.
2. All pipe in the work area shall be wetted with a soapy water solution* from soil to soil the full length of the excavation.
3. Make sure that contact with the soil is made at the ends.
4. For purging operations of 5' or less, the above method can be utilized for dissipating static electricity. For purging of sections over 5' in length, refer to CS H-5, Purging.

When performing any maintenance, splices, repairs, taps, etc. on any existing plastic...
PROCEDURES
PREVENTION OF ACCIDENTAL IGNITION

As gas lines, control of static electricity is a major concern. The following is the procedure to be used in static electricity control:

1. Expose pipe by excavating below pipe to working area desired.
2. Clean off exposed plastic pipe then thoroughly rinse off with approved soapy water solution.
3. Wrap pipe with cotton rags or burlap sacks soaked in a conductive anti-static liquid or a dilute soap and water solution.
4. Wrap starting at the trench wall inward along the pipe on both sides of the repair to be made toward the work area providing a path for the static charge to ground.
5. Be certain rags touch the ground with 4”-6” slack. Pour soapy water solution over rags, being sure to saturate them and pool soapy water solution on ground where rags contact ground.
6. Install jumper cables on tracing wire to be cut and spliced.
7. Install jumper cables on all metallic tools being used.

*Note:* A soapy solution can be made by mixing 8-12 ounces of leak test soap with one (1) gallon of water.

B. Steel or other Metallic Pipe: The use of ground cables and ground rods or plates shall be utilized as a precaution against static spark.

1. Before any pipe or tools are installed or removed place ground straps, insulated wire, or other approved device on each tool, pipe, or pipeline facility that is separated or may be separated. Ensure that each surface is clean and that cables make adequate connection.
2. Ground rods or plates shall be securely placed in the ground as to provide an adequate path for the static electricity and as not to be disturbed during the performance of the work.
3. Ground cables shall remain in place throughout the entire work performance.
4. Use of brass tools will reduce the chance of creating an accidental spark.

6.4 SMOKING

Smoking shall be carefully restricted to safe distances (220 feet or greater) from work areas. Under the following circumstances, no employee shall smoke nor allow anyone else to smoke in the restricted area.

1. When any job is in progress that will allow gas to escape.
2. When doing work in a vault where gas is under pressure.
PROCEDURES
PREVENTION OF ACCIDENTAL IGNITION

3. When flammables, such as gasoline, diesel fuel or acetone might be present.
4. When "No Smoking" signs are posted, cigarettes, matches and lighters shall be left at a safe distance.

Barricades, caution tape, and no smoking signs shall be utilized to define restricted area during the work performance.

6.5 COMBUSTIBLE ATMOSPHERE

Before entering areas where gas can accumulate, such as vaults and excavations that have been plated overnight test for the presence of combustible gases will be made with a combustible gas indicator (CGI).

Electric tools or fusion equipment may not be explosion-proof and may ignite a flammable gas atmosphere. **DO NOT operate electrical devices that are not explosion proof in a flammable gas atmosphere.**

6.6 PREVENTING AIR FROM ENTERING OPEN MAINS

Whenever possible, a main line shall not be open at two places at the same time, such as a blow-down or a cut in the line. This may permit a draft of air to enter the line at one opening and escape at the other, which allows the possible formation of an explosive mixture. This can be caused by wind pressure or by difference in elevation of the two openings, permitting air to enter the lower of the two openings. This must be guarded against, particularly when working large size mains. No main, service or other gas piping shall be cut apart without being properly grounded and purged by approved method.

One method of reducing the risk of air from entering a mainline is to cover the opening with a canvas tarp of other fire resistant material while preparing to make repairs.