



**GAS TRANSMISSION AND DISTRIBUTION
PIPING SYSTEMS WORK PROCEDURE
BERGEN COUNTY UTILITIES AUTHORITY**

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INTRODUCTION

This document was developed to describe and implement the Bergen County Utilities Authority (BCUA) GAS TRANSMISSION AND DISTRIBUTION PIPING SYSTEMS WORK PROCEDURE. The plan was developed to protect against fire, explosion and/or asphyxiation when working on any system designed for gas transmission and distribution.

July 6, 1998



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1. DESCRIPTION OF PLAN AND DISTRIBUTION SYSTEM

A. General

The intent of this procedure is to protect workers from the hazards of fire, explosion and/or asphyxiation when working on any system designed for gas transmission and distribution at the Bergen County Utilities Authority (BCUA).

Distribution piping systems or transmission lines are those pipes installed for the purpose of transmitting gas from one point to another. The gas can be any gas or mixture of gases distributed through the piping system such as digester gas.

B. Responsibilities

1. *Supervisors*

Supervisors of maintenance personnel that will be working on the distribution piping or gas transmission systems and operations area as well as Supervisors that have distribution or gas transmission systems being worked on must be familiar with all aspects of this program and are responsible for providing on-the-job training in proper work procedures to their employees.

2. *Affected Employee*

Personnel who's job requires him/her to work on or repair distribution piping / gas transmission systems must be trained in lockout/tagout and be thoroughly familiar with this work procedure.

3. *Authorized Employee*

Personnel who's job requires him/her to work on or repair distribution piping / gas transmission systems and will be responsible for coordinating the particular job. An Authorized Employee must be trained in lockout/tagout and be thoroughly familiar with this work procedure

4. *Director of Quality and Safety*

The Director of Quality and Safety shall periodically review the work procedures with the Maintenance Manager and update the program, as necessary. The Director of Quality and Safety will also be responsible for



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coordinating training and retraining for appropriate employees including lockout and tagout training.

2. PROTECTIVE MEASURES

A. Permits

1. No job shall begin unless a permit For Gas Transmission and Gas Distribution Piping Systems Work has been issued and approved by the Supervisor. Figure 1 at the end of this document illustrates the BCUA approved Gas Transmission and Distribution Piping Systems permit tag to be used.
2. The permit tag shall be obtained by the Authorized Employee assigned to do the job. The supply of permit tags are to be obtained from the employee's Supervisor. The alternate source for a tag will be the BCUA Director of Quality and Safety.
3. The signed permit tag is to be kept at the jobsite, in clear view, until the work is completed.
4. Any Supervisor has the right to halt the job if actual work conditions do not meet the requirements of this procedure and the work permit. The Maintenance and Operations Area Supervisors shall be notified if this situation arises.
5. Permits shall be returned to the Maintenance Supervisor when the work is completed.
6. A Checklist (refer to Figure 2) shall be completed and retained with the permit.

B. Standard Procedures

The established procedures for work on gas transmission and distributions piping systems shall cover the following elements and shall be performed in the following sequence:

1. The Authorized Employee shall review the procedure and instruct the crew on this procedure and be satisfied that the work crew understands the



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procedure to be followed.

2. The Authorized Employee shall verify that all necessary safety equipment including any required Personal Protective equipment (PPE) as listed in Section 3. "Safety Equipment" of this program, is available and has been obtained.
3. The valve(s) controlling the source of gas from the upside of the system nearest the work location shall be closed and locked in the off (closed) position. The key to this lock shall be under the control of the Authorized Employee performing work on this system as in lockout/tagout procedures.

If locking is not practical, possible or feasible, the valve(s) shall be appropriately tagged in the closed off position. The tag shall be worded "DO NOT OPEN" or "DANGER", or words to that affect.

4. The area being worked in shall be barricaded off so that static electricity or flame is not introduced by passersby walking into or through the area. Warning signs shall be placed on the barricades or caution tape accordingly, including "NO SMOKING" signs, and "DO NOT ENTER" signs or wording to that effect.
5. In addition to any existing general ventilation, when working indoors, additional ventilation should be provided by portable spark-proof type fans.
6. A meter or meters which will monitor the atmosphere shall be available and used by a qualified person having knowledge in the use of such type of metering device(s). For example, when working with chlorine, a MS A Model 90 or passport chloride detector shall be used.

The meter(s) shall be positioned at a height and location closest to the work area, in order to achieve as accurate a reading as possible of the ambient air.

Meters shall also be used to determine if the ceiling level of any involved gases is exceeded. The Supervisor should determine if respirators are required and if there is an alternate means to purge the lines or the area.



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Work and all spark producing activities, including the use of electrically operated tools, welding, burning or the use of any type of tool will be stopped if the alarm of the detection meter, set to 10% of the LEL, is activated. This condition shall be immediately reported to the Supervisor of the job. Any reentry into this area shall be carefully conducted with monitoring devices and respiratory protection as necessary.

7. Any employee engaged in this work shall not engage in any spark producing activities such as smoking or in the lighting of matches or lighters.
8. For any length of pipe between the shut-off valve and the work area, any residuals of gas vapors within the piping should be allowed to seep out or be exhausted when practical before work is begun. Nitrogen gas shall be used as a purging agent when a vessel or pipe cannot by its nature, allow its contents to seep out (self ventilate) or be exhausted. If nitrogen gas is introduced, oxygen readings shall be taken continually and maintained above 19.5%.
9. If the area is protected by an automatic type fire suppression system, check that the system is in service and not shut off.
10. If the work is not completed by the end of the shift, the piping shall be blanked off and the valve(s) shall be maintained in the closed position and tagged accordingly.
11. Upon completion of the work, the pipe lines shall be properly restored to working condition. When valves are opened, the area surrounding the pipeline shall be checked with a meter to determine if any gases are leaking out.

All locks, tags, signs and barricades used during the work shall be removed from the area.

A Fire Watch shall be established if necessary. See section on requirements for a Fire watch.

The work area shall be restored to its original condition and cleared of all equipment brought in for the work.

The Maintenance Supervisor and Operations Area Supervisor should inspect the area.



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The Maintenance Supervisor and Operations Area Supervisor should inspect the area.

C. Welding, Cutting, and Burning

If welding, cutting, burning or other operations that could be a source of ignition are conducted, all hot work procedures shall be followed in accordance with the following:

1. Obtain a Hot Work permit from the Supervisor before performing any work. A copy of the BCUA approved Hot Work Permit is shown in Figure 3.
2. When and where applicable, floor areas should be wetted down before hot work is undertaken.
3. The section being worked on shall be purged if necessary before any welding, burning or cutting operation. Combustibles shall be isolated from any sources of ignition (i.e., flammables stored in FM or UL listed cabinets marked FLAMMABLE according to the National Fire Protection Association (NFPA) code).
4. Obtain standby fire extinguishers and locate them at the work site. Instruct fire watcher to be alert to extinguish any small fires. In poorly ventilated areas, use of CO2 extinguishers should be limited.
5. During hot work operations, carefully verify that there are no leaks from the valve(s) within the pipeline being worked on.

D. Requirements for Fire Watch and Fire Extinguishers (If any hot work is performed)

1. The person designated as Fire Watch shall remain at the scene of work for at least a half hour afterward or until it is certain that no embers or debris are smoldering.
2. Note requirements on the permit for refilling fire extinguishers if they have had their seal removed or been discharged.
3. Standby fire extinguishers are to be obtained only from Receiving and returned to Receiving, if not used, when the job is completed.



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3. SAFETY EQUIPMENT

1. Appropriate permits and permit tags
2. Explosion proof lighting and extension cords
3. Explosion proof fans (if working indoors)
4. Explosimeter (LEL Meter)
5. Oxygen deficiency or other meter(s), as necessary
6. Lockout equipment (locks and/or tags)
7. Spark-proof tools*
8. Flame resistant clothing when performing hot work
8. Safety helmet
9. Safety glasses
10. Rubber gloves and boots*
11. Barricades, ropes or caution tape
12. "DO NOT ENTER" and "NO SMOKING" signs
13. Standby fire extinguishers (2) - 1 ABC type unit and 1 CO2 type unit.
14. Respirators if exposed to fumes.
15. First Aid equipment*

* optional - as needed

4. TRAINING

All appropriate, authorized and affected employees will receive training before performing or being involved with gas transmission and distribution piping work. The training will include, at a minimum, the following:

1. Lockout/Tagout training in accordance with the BCUA's Lockout/Tagout Program, and
2. A review of this written work procedure.
3. Fire extinguishing procedures.



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Figure 1 BCUA Approved Gas Transmission and Distribution Piping System Lock-out
Tag

Electromark 800-921-0122

BERGEN COUNTY UTILITIES AUTHORITY
PERMIT NO.

**FOR GAS TRANSMISSION AND
GAS DISTRIBUTION
PIPING SYSTEMS WORK**

DATE _____ TIME _____

LOCATION _____

NATURE OF JOB _____

MECHANIC SIGNATURE _____

CLOCK NO. _____

MECHANIC SIGNATURE _____

CLOCK NO. _____

**ALL PRECAUTIONS NOTED ON THE REVERSE SIDE OF THIS
PERMIT HAVE BEEN TAKEN, AND PERMISSION IS GIVEN TO
PERFORM THIS WORK.**

SIGNED _____ Maintenance Supervisor

SIGNED _____ Maintenance Superintendent

SIGNED _____ Safety Director

SIGNED _____ Operations Area Supervisor

BERGEN COUNTY UTILITIES AUTHORITY
PERMIT NO.

DATE _____

LOCATION _____

NATURE OF JOB _____

MECHANICS _____

FORWARD THIS TEAR-OFF PART TO SAFETY DIRECTOR



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Figure 2 **CHECKLIST**

Permit # _____ Date _____ Area _____
Nature of job _____

OPENING PROCEDURES

- | | | |
|--|----------------------|------------------------------------|
| 1. Procedure reviewed with work crew? | YES | NO |
| 2. Valves closed and locked/tagged? | YES | NO |
| 3. Area barricaded and properly signed? | YES | NO |
| 4. Additional ventilation fans provided if working indoors? | YES | NO |
| 5. Atmosphere monitored by _____ | | |
| 6. Possible gases involved? _____ | ceiling level? _____ | meter type (to measure gas)? _____ |
| _____ | _____ | _____ |
| 8. Respirator required? | YES | NO |
| 9. Purging agent such as Nitrogen used?
If Yes, Oxygen readings must be taken (above 19.5%) | YES | NO |
| 10. Spark producing activities regulated? | YES | NO |
| 11. Fire extinguisher available? | YES | NO |
| Fire suppression system in service (if applicable)? | YES | NO |
| 12. For Hot Work: | | |
| Floors wetted down if applicable? | YES | NO |
| Is line purging necessary? | YES | NO |

CLOSING PROCEDURES

- | | | |
|---|-----|----|
| 1. Lines properly closed? | YES | NO |
| 2. Valves opened, area checked for leaks with meters? | YES | NO |
| 3. Locks, tags, signs and barricades removed? | YES | NO |
| 4. Fire watch established, if necessary? | YES | NO |

Watcher _____ Time _____

CHECKLIST FILLED OUT BY _____



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Figure 3 BCUA Hot Work Permit

HOT WORK PERMIT

**BEFORE INITIATING HOT WORK, CAN THIS JOB BE AVOIDED?
IS THERE A SAFER WAY?**

This Hot Work Permit is required for any temporary operation involving open flames or producing heat and/or sparks. This includes, but is not limited to: Brazing, Cutting, Grinding, Soldering, Thawing Pipe, Torch Applied Roofing and Welding.

PART 1

INSTRUCTIONS

- 1. Firesafety Supervisor:**
 - A. Verify precautions listed at right (or do not proceed with this work).
 - B. Complete and retain PART 1
 - C. Issue PART 2 to person doing job.

HOT WORK BEING DONE BY:

EMPLOYEE

CONTRACTOR

DATE _____ JOB NO. _____

LOCATION/BUILDING & FLOOR _____

NATURE OF JOB _____

NAME OF PERSON DOING HOT WORK _____

I verify the above location has been examined, the precautions checked on the Required Precautions Checklist have been taken to prevent fire, and permission is authorized for this work.

SIGNED: (FIRESAFETY SUPERVISOR) _____

PERMIT EXPIRES:	DATE	TIME	AM
			PM

NOTE EMERGENCY NOTIFICATION ON BACK OF FORM. USE AS APPROPRIATE FOR YOUR FACILITY.

REQUIRED PRECAUTIONS CHECKLIST

- Available sprinklers, hose streams and extinguishers are in service/operable.
- Hot Work equipment in good repair.
- Requirements within 35 ft. (11m) of work**
- Flammable liquids, dust, lint and oily deposits removed.
- Explosive atmosphere in area eliminated.
- Floors swept, clean.
- Combustible floors wet down, covered with damp sand or fire-resistive sheets.
- Remove other combustibles where possible. Otherwise protect with fire-resistive tarpaulins or metal shields.
- All wall and floor openings covered.
- Fire-resistive tarpaulins suspended beneath work.
- Work on walls or ceilings.**
- Construction is noncombustible and without combustible covering or insulation.
- Combustibles on other side of walls moved away.
- Work on enclosed equipment**
- Enclosed equipment cleaned of all combustibles.
- Containers purged of flammable liquids/vapors.
- Fire watch/Hot Work area monitoring**
- Fire watch will be provided during and for 60 minutes after work, including any coffee or lunch breaks.
- Fire watch is supplied with suitable extinguishers, charged small hose.
- Fire watch is trained in use of the equipment and in sounding alarm.
- Fire watch may be required for adjoining areas, above, and below.
- Monitor Hot Work area for 4 hours after job is completed.

Other Precautions Taken

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Distribution list

- Supervisor of Sludge Handling
- Supervisor of Head End Operations
- Supervisor of Sludge Dewatering
- Supervisor of Maintenance
- Manager of Operations and Maintenance
- Engineering Department
- Director of Quality & Safety