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### Measure Structure-to-Electrolyte (Pipe to Soil) Potential

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#### SCOPE AND PURPOSE

This procedure is to ensure adequate external corrosion protection for the pipeline systems. It describes cathodic protection inspection practices required to comply with §192.465(a).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that pipe-to-soil measurements are performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Do not conduct the survey during a lightning storm. Electricity from the lightning could travel onto the pipe and result in death or injury when electrical contact is made with the pipe during the pipe to soil measurement.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Copper-copper sulfate electrode
- Copper sulfate solution
- Water
- Ammeter/Voltmeter/Multi-meter
- Wire dispensing reel
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

- a. Visually check the survey electrode (half-cell) in accordance with manufacturer's instructions:
  - i. The exterior of the electrode should be free of cracks or any other damage that would render the electrode inoperable.
  - ii. The copper sulphate solution should be filled to the proper level/range and should not be cloudy or murky.
  - iii. The porous plug should be intact and not cracked or missing large pieces.
- b. After any maintenance, repair or replacement of the primary electrode has been performed, check the survey electrode by connecting the porous plug of the survey electrode with the porous plug of another electrode, by direct contact or in a conductive solution, and measure the potential difference. A difference of 5 mV or less is acceptable.
- c. Ensure the multi-meter batteries are adequately charged
- d. Select the proper meter settings and range (Set to read DC voltage), if applicable.
- e. Locate and identify the proper test station, or pipe riser to read.
- f. Connect the positive lead from the meter to the pipe or test station and the negative lead to the Copper/Copper Sulfate electrode to obtain the correct polarity.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Measure Structure-to-Electrolyte (Pipe to Soil) Potential

- g. Place the electrode in contact with the soil directly over the pipeline. If good electrical contact cannot be made, wet the ground with water.
- h. Record the pipe-to-soil potential, exactly as it appears on the meter, including all decimal points.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

Review all pipe-to-soil potential readings for compliance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

- 0011 - Conduct Close Interval Survey
- 0021 - Measure Soil Resistivity
- 0031 - Inspect and Monitor Galvanic Ground Beds/Anodes
- 0091 - Troubleshoot In-Service Cathodic Protection Systems

#### ABNROMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | Reactions to AOC, as appropriate  |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component (T/S)</li> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Conduct Close Interval Survey

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel obtain pipe-to-soil potential readings at specified distance intervals along a pipeline that this work is performed in a manner that provides meaningful data for interpretation of cathodic protection levels.

It describes practices required to comply with §§192.455 and 192.463, and Appendix D to Part 192.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when obtaining pipe-to-soil potential readings at specified distance intervals along a pipeline, that this work is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger.  
Ensure that all applicable safety equipment is being utilized as per company policy.  
Provide an escort for the surveyor in traffic areas.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- 10 megaohm input impedance digital voltmeter
- Global Positioning System (GPS) instrument
- Datalogger instrument
- DC Voltage interrupter
- #30 to #34 AWG transformer wire
- Copper Copper-Sulfate reference electrodes
- Reference electrode extension canes
- Spare batteries for all DC powered instruments
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### On Potential Survey – Sacrificial Anode System

1. Locate and temporarily mark the entire piping system to be surveyed.
2. Test two Copper Copper-Sulfate reference electrodes using the digital voltmeter by connecting the reference electrodes to the voltmeter leads and making contact between the ceramic tips. The voltage reading should be less than or equal to 1 millivolt. Disassembly and cleaning of reference electrodes will usually correct voltage readings that are unacceptable.
3. Use enough transformer wire to reach from one cathodic protection test station to the next test station.

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### Conduct Close Interval Survey

4. Connect one end of the transformer wire to the cathodic protection test station lead that is connected to the pipeline. Connect the other end of the transformer wire to the positive side of the digital voltmeter.
5. Install the reference electrodes into the extension canes. (One reference electrode can be used, however, two reference electrodes with extension canes allows the survey to proceed at a faster pace).
6. Connect the reference electrode leads into a splice fitting and connect the splice fitting to the negative or "common" side of the digital voltmeter.
7. Turn on the digital voltmeter and take a few test readings a short distance from the starting test station and just over the pipeline at intervals of approximately three feet. If the readings appear to be acceptable, begin the actual survey.
8. Continue obtaining pipe-to-soil readings at approximately three foot intervals to the next cathodic protection test station by placing one reference electrode at a time in contact with the soil just above the pipeline. At each three foot interval, alternate the reference electrode used as if using the extension canes as walking staffs.
9. When the next cathodic protection test station is reached, take and record a voltage reading at the successive test station lead attached to the pipeline. Record this voltage value along with polarity. The pipeline is used as a current shunt (resistor) while the wire is used to read the voltage drop across the pipeline segment between cathodic protection test stations. This reading can be used to detect current flow from outside sources through the pipeline segment, should it exist. This reading should be specially identified on recorded data.
10. If a data logger is used in conjunction with the digital voltmeter, all voltage readings and distances between cathodic protection test stations will be recorded.
11. If no data logger is available, a GPS instrument can be used to record distance values while each voltage reading is recorded by the survey escort.
12. Complete the entire survey and record all data obtained.
13. Apply the data to graph paper or a computer software program that develops a graph. Compare the voltage readings to the minimum criteria of -0.850 volts DC required by Federal regulations.
14. Areas that are not within minimum criteria should be scheduled for excavation and direct examination.

### On - Off Potential Survey – Impressed Current System

1. Connect the DC voltage interrupter to the DC output circuit of the impressed current rectifier according to manufacturer instructions. Rectifiers equipped with filtered output current, either by chokes or capacitors, must have this feature disconnected during the survey in order to obtain meaningful data.
2. Set the DC voltage interrupter at a commonly used interruption cycle of 800 milliseconds "On" and 200 milliseconds "Off". The digital voltmeter will also cycle at this rate and only take pipe-to-soil readings while the impressed current is "Off".
3. If multiple impressed current rectifiers are used for a single pipeline, each rectifier must have a separate DC voltage interrupter and all interrupters must be accurately synchronized such that current interruption along the pipeline occurs simultaneously.
4. Impressed current cathodic protection system that has been supplemented with sacrificial anodes may produce erroneous pipe-to-soil data.
5. When the DC voltage interrupter cycles the protective current "Off", the polarized voltage potential of the pipeline can be momentarily read on the digital voltmeter. Use of a data logger is recommended here in order to accurately determine the actual polarized voltage potential value

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### Conduct Close Interval Survey

when data is displayed graphically. The polarized voltage potential is a voltage that is independent of IR (voltage) drop across the electrolyte.

6. The most reliable portion of the polarized voltage potential value graphic is just after the leading "Off spike" and before the DC voltage interrupter cycles back to the "On" position.
7. The walking speed during the survey must be controlled in order to collect the correct number of data values per liner distance of survey traveled.
8. Complete the entire survey and record all data obtained. There will be twice as much data collected as with the On Potential Survey since both "On" and "Off" voltage potentials are recorded.
9. Apply the data to graph paper or a computer software program that develops a graph. Compare the voltage readings to the minimum criteria of -0.850 volts DC required by Federal regulations.
10. Areas that are not within minimum criteria should be scheduled for excavation and direct examination.

### Cell - to - Cell Potential Survey – Sacrificial Anode System

**It should be noted that when using either type of Cell-to-Cell Potential Survey, as follows, sacrificial anodes will be indicated as corrosion cells and/or pipeline coating anomalies, therefore, it is essential that sacrificial anode locations are known prior to utilizing these methodologies, otherwise, unnecessary excavation efforts may be employed.**

1. This type of close interval pipe-to-soil voltage potential survey is conducted in a similar manner as the On Potential Survey when sacrificial anodes are providing cathodic protection to the pipeline, with the following exceptions:
  - a. "Leap Frog" reference electrode method:

Perform the alternating pipe-to-soil potential readings in an identical manner as is performed using the On Potential Survey keeping in mind that each voltage potential reading may require arithmetic correction due to the fact that when electrical polarity changes on the digital voltmeter, this occurrence indicates an anomaly in coating integrity and/or an active corrosion cell on bare piping.
  2. If a data logger is used in conjunction with the digital voltmeter, all voltage readings and distances between cathodic protection test stations will be recorded.
  3. If no data logger is available, a GPS instrument can be used to record distance values while each voltage reading is recorded by the survey escort.
  4. Complete the entire survey and record all data obtained.
  5. Apply the data to graph paper or a computer software program that develops a graph. Compare the voltage readings to the minimum criteria of -0.850 volts DC required by Federal regulations.
  6. Areas that are not within minimum criteria should be scheduled for excavation and direct examination.

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### Conduct Close Interval Survey

#### Cell - to - Cell Potential Survey – Impressed Current System

1. This type of close interval pipe-to-soil voltage potential survey is conducted in a similar manner as the On Potential Survey when impressed current systems are providing cathodic protection to the pipeline, with the following exceptions:
  - a. “Alternating” reference electrode method:  
Each pipe-to-soil voltage potential reading is taken by placing the successive reference electrode into the soil depression made by the preceding reference electrode.
  - b. Each reference electrode must be placed at an equidistant interval from the previous reference electrode placement position, in order to obtain a meaningful pipe-to-soil voltage potential value.
  - c. Corrosion cell identification, and/or pipeline coating anomalies indicating an active corrosion cell, can be identified by reversal of the digital voltmeter polarity while performing the subject survey.
2. If a data logger is used in conjunction with the digital voltmeter, all voltage readings and distances between cathodic protection test stations will be recorded.
3. If no data logger is available, a GPS instrument can be used to record distance values while each voltage reading is recorded by the survey escort.
4. Complete the entire survey and record all data obtained.
5. Apply the data to graph paper or a computer software program that develops a graph. Compare the voltage readings to the minimum criteria of -0.850 volts DC required by Federal regulations.
6. Areas that are not within minimum criteria should be scheduled for excavation and direct examination.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

0001 – Measure Structure – to – Electrolyte Potential, 0091 – Troubleshoot In-Service Cathodic Protection System, 0111 – Maintain Rectifier, 0171 – Measure External Corrosion

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component (T/S)</li> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Measure Soil Resistivity

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel measure soil resistivity for the purpose of designing cathodic protection systems for buried metallic gas facilities that this effort is performed according to industry accepted practice.

Although there are no specific requirements for testing of soil resistivity under 49 CFR Part 192, reference to this practice is made for operators intending to demonstrate that a corrosive environment does not exist according to the provisions of §192.455.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when measuring soil resistivity, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger.  
Ensure that all applicable safety equipment is being utilized as per company policy.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Resistance meter
- Mark III Soil box
- Steel soil pins
- Spare batteries for all DC powered instruments
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Wenner Four Pin Method

1. Select the area to be tested for soil resistivity.
2. Drive two soil pins into the soil at a distance of fifteen feet between the pins. This spacing is sufficient for soil resistivity testing at a depth of five feet of soil depth.
3. Connect a resistance meter lead from the C1 terminal to one of the first two soil pins and another resistance meter lead from the C2 terminal to the other soil pin.
4. Drive two additional soil pins at a distance of five feet each between the first soil pins. The resulting pin configuration will be four soil pins spaced at five feet apart in a liner fashion.
5. Connect a resistance meter lead from the P1 terminal to one of the two secondary soil pins and another resistance meter lead from the P2 terminal to the other secondary soil pin. The soil resistivity testing circuit is complete.



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### Measure Soil Resistivity

6. For extremely dry soil conditions, a small amount of tap water can be poured at the site of each soil pin to reduce soil contact resistance.
7. Move the spring loaded resistance meter switch to the battery test position and hold the switch in that position for a moment in order to ascertain battery integrity. Replace batteries as necessary.
8. Adjust the "Ohms" switch to the central position.
9. Adjust the "Range" (multiplier) switch to the lowest available setting.
10. Move the spring loaded resistance meter switch to the "Adjust" position and hold the switch there while moving the "Range" (multiplier) switch from one position to the next until meter needle deflection is observed.
11. While maintaining the spring loaded resistance meter switch to the "Adjust" position, alternate using the "Ohms" switch and the "Range" (multiplier) switch in order to fine tune the meter dial to a "zero" value. Attempt to keep the "Ohms" switch at or near the center of its span.
12. Avoid "Ohms" switch settings that are near the top and bottom of the "Ohms" switch span.
13. Multiply the "Ohms" scale reading by the "Range" (multiplier) switch value. The resulting mathematical product is the soil resistance in units of "Ohms".
14. Use the following mathematical formula to obtain the soil resistivity in units of "Ohm-cm":

$$\rho = 191.5 (A) (R)$$

where;

- $\rho$  = Resistivity, Ohm-cm
- 191.5 = conversion factor
- A = linear distance between soil pins, ft.
- R = calculated meter resistance, Ohms

15. The following table is a list of commonly accepted gas industry values for soil resistivity ranges and associated degrees of corrosivity: (*Reference: NACE Corrosion Basics*)

| Soil Resistivity, Ohm-cm | Degree of Corrosivity |
|--------------------------|-----------------------|
| 0 – 500                  | Very Corrosive        |
| 500 – 1,000              | Corrosive             |
| 1,000 – 2,000            | Moderately Corrosive  |
| 2,000 – 10,000           | Mildly Corrosive      |
| > 10,000                 | Negligible            |

#### Soil Box Method

1. Obtain a sample of soil to be tested, and remove any rocks and other debris.
2. The Mark II soil box has side terminal pins that should be removed prior to introducing the soil sample. Other soil boxes may not have such terminal pins.
3. Tap water may be added to the soil sample in order to simulate actual native soil conditions.
4. Fill the soil box to the top with the soil sample, and using a suitable tool, compact the soil in the box. The box should be full of soil sample and level to the top. Add more soil as needed. Do not aggressively compact such that the box and its plastic parts are damaged.
5. When using the Mark III soil box, insert the terminal pins at this time.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Measure Soil Resistivity

6. For soil boxes having terminal pins at each end of the soil box, connect a resistance meter lead from the C1 terminal to one of the soil box terminal pins and another resistance meter lead from the C2 terminal to the other soil box terminal pin. Next, connect the P1 and P2 resistance meter leads to metallic probes and insert the probes into the soil sample between the two end terminal pins. This method simulates the Wenner Four Pin Method, but under laboratory conditions.
7. When using the Mark III soil box, connect the C1 and P1 terminal leads in parallel circuitry fashion and connect the C2 and P2 terminal leads in parallel circuitry fashion and connect each paired terminal lead assemblies to a single soil box pin.
8. Following the instructions for obtaining a soil resistance value in "Ohms" from items 7. through 15. from the Wenner Four Pin Method above, calculate the resulting soil resistivity in "Ohm-cm". Always use the soil box multiplies, as necessary to adjust the resulting value.
9. Prior to disposal of the boxed and compacted soil sample, apply tap water to the sample and record a supplemental soil resistivity value. This value may be used to simulate soil resistivity of the soil sample when wet at buried pipeline depth.
10. Soil resistivity values using either the Wenner Four Pin Method or the Soil Box Method are to be used for calculating pipeline protective current requirements for new pipelines, sacrificial anode size and linear/depth distribution intervals, as well as the extent of deep well anode beds associated with impressed current rectifier systems.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

None

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component (T/S)</li> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Inspect and Monitor Galvanic Ground Beds/Anodes

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel inspect and monitor galvanic anode ground beds that this practice is performed in a manner that produces data substantiating acceptable levels of cathodic protection. It describes practices required to comply with §192.465 and Appendix D of Part 192.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when inspecting and monitoring galvanic anode ground beds, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger.  
Ensure that all applicable safety equipment is being utilized as per company policy.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- 10 megaohm input impedance digital multimeter
- Copper Copper-Sulfate reference electrode
- Spare batteries for all DC powered instruments
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

These instructions assume that the galvanic ground bed/anodes have been installed using test leads that terminate in test stations.

1. Set the digital multimeter to measure current from the galvanic anode to the pipeline by connecting the positive multimeter lead to the pipeline test lead and the negative or "common" multimeter lead to the anode lead.
2. Record the current value obtained in order to develop a current output history for the galvanic anodes tested. This data indicates remaining anode life over time.
3. If shunt resistors are installed between the galvanic anode and pipeline lead wires in the test station, set the digital multimeter to measure DC voltage and obtain a reading across the shunt resistor side pins.
4. Divide the voltage drop reading from the shunt resistor by the shunt resistor value typically stamped on the shunt resistor body. The resulting value is the current flowing from the galvanic anode to the pipeline.
5. If a pipe-to-soil potential reading is required, disconnect the anode lead from the pipeline test lead and obtain the pipe-to-soil potential value without the output current influence of the galvanic

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### Inspect and Monitor Galvanic Ground Beds/Anodes

anode. Attempt to place the Copper Copper-Sulfate reference electrode as directly over the pipeline as is possible in order to account for IR drop across the electrolyte.

6. If multiple galvanic anodes are installed in a bed fashion and each has a shunt resistor installed at the test station along with a shunt resistor installed between the pipeline test lead and the galvanic anode bed, the output current for each individual galvanic anode can be obtained as well as a total output current from the entire anode bed.
7. Galvanic anode life has been depleted when 85% of the original output current value is gone.
8. Graphic representation of the aforementioned output current values for galvanic anodes is used to predict remaining galvanic anode life as well as scheduling of galvanic anode replacement prior to loss of pipe-to-soil potential values that are below required/acceptable criteria.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

- 0001 – Measure Structure-to-Electrolyte Potential
- 0091 – Troubleshoot In-Service Cathodic Protection System

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component (T/S)</li> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Installation and Maintenance of Mechanical Electrical Connections

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel install and maintain mechanical electrical connections that these devices are installed in a manner that provides mechanical security and electrical conductivity. It describes practices required to comply with § 192.471.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when installing and maintaining mechanical electrical connections that this work is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger.  
Ensure that all applicable safety equipment is being utilized as per company policy.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTALLATION INSTRUCTIONS

##### General

Ensure that a strain loop or tension restraint is to be incorporated with the mechanical electrical wire connection near the pipe connection area.

##### Crimp Connectors

1. Install the crimp connector using the same gauge of wire into each end of the crimp connector. Take care not to over-crimp the connector and wire.

##### Threaded (screw) Compression Connectors

1. Ensure that when tightening wire inside a threaded compression connectors that the wire is not over tightened.

##### Split Bolt Connectors

1. Split bolt connectors function much the same as threaded compression connectors except that wire can be inserted from either or both side of the connector and when tightening the connector screw, wire damage is minimized since the connector has a non threaded face in contact with the wire.

##### Solder Connections

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### Installation and Maintenance of Mechanical Electrical Connections

1. Ensure that wire composition is compatible with the particular solder material to be used to make the connection.
2. Thoroughly clean and apply flux to the wire surfaces to be soldered together.
3. Heat the wire surfaces to be soldered to a temperature that allows solder to flow onto the wire.
4. Clean all acid flux from the wire after soldering and appropriate cooling time as acid flux can accelerate corrosion.

#### **Wire Nut Connectors**

1. Strip the wire ends to a suitable length that is compatible with the wire nut to be used.
2. Twist the solid or stranded wire ends together in a clockwise direction and twist the wire nut connector onto the stripped wire ends also in a clockwise direction until snug.
3. Do not over tighten the wire nut. Metallic insert wire nuts are preferable to plastic internal threaded wire nuts for added mechanical strength.
4. Some operators perform an electrical continuity test on mechanical electrical connections and associated electrical wire systems prior to backfilling.

#### **MAINTENANCE INSTRUCTIONS**

1. All mechanical electrical connections must be protected from atmospheric or earthen electrolyte corrosion.
2. When using wire nuts, consider those that are filled with a dielectric lubricant in order to avoid corrosion over the wire ends or insert the wire nut cover tube filled with dielectric grease that is specially made for this purpose.
3. All other splice types including; crimp, threaded (screw), split bolt, and solder connections require the application of either a dielectric grease, suitable petroleum mastic, or "liquid electrical tape" to act as a water proof coating followed by an ample wrap of non conductive tape.
4. Additional future maintenance requirements are commonly due to damage by outside forces and may not always be avoided, but can be remedied when the operator has knowledge of such damage.
5. Mechanical electrical connections that are installed for the purpose of monitoring cathodic protection systems can be electrically tested for discontinuity indicating separated connections.

#### **REPORTING/NOTIFICATION**

Complete documentation in accordance with Operation and Maintenance Manual.

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|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
|-------------------|------------------------------|---------------|

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### Installation and Maintenance of Mechanical Electrical Connections

#### RELATED PROCEDURES

- 0001 – Measure Structure-to-Electrolyte Potential
- 0091 – Troubleshoot In-Service Cathodic Protection Systems
- 0941 – Install Tracer Wire

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component (T/S)</li> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Installation of Exothermic Electrical Connections

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel install exothermic electrical connections that this work is performed in a manner that provides adequate exothermic attachment to the pipeline as well as adequate pipe coating repair.

It describes practices required to comply with §§192.461 and 192.471.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when installing exothermic electrical connections that, this work is performed in a manner that is described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger.

Ensure that all applicable safety equipment is being utilized as per company policy.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Mechanical Equipment
- Hand Tools
- Appropriately sized and insulated test lead and/or tracer wire
- Exothermic electrical connection tools including;
- Appropriately sized test lead and/or tracer wire copper sleeves
- Exothermic ignition oven (crucible), Exothermic metallic disks
- Appropriately sized exothermic ignition charges, Exothermic charge igniter
- Exothermic furnace cleaning tool, Pin brazing gun
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.



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### Installation of Exothermic Electrical Connections

#### INSTRUCTIONS

#### Conventional Exothermic Welding (CADWELD, THERMOWELD, etc.)

1. The pipe surface must be thoroughly cleaned to a bright shiny appearance and free of moisture, oil, and grease prior to exothermic welding.
2. CAUTION – Never exothermically weld to a corroded pipe surface.
3. ANSI/ASME B31.4 and B31.8 list the following minimum pipe wall thickness data for exothermic welding:

| Nominal Pipe Diameter, in. | Pipe Schedule | Wall Thickness, in. |
|----------------------------|---------------|---------------------|
| 1/2                        | 40            | 0.109               |
| 3/4                        | 40            | 0.113               |
| 1 to 2                     | 10            | 0.109               |
| 2 1/2 to 4                 | 10            | 0.112               |
| 5 to 8                     | 5             | > 0.109             |
| ≥ 10                       | 5             | > 0.109             |

4. Strip the insulation from the solid core copper #12 or #14 AWG anode or test lead wire, about 1 1/2 inches from the end.
5. Crimp a copper sleeve on the bare portion of the wire leaving about 1/8 inch of the wire protruding from the end of the copper sleeve.
6. Tie or wrap the wire to the piping so that any mechanical strain will not damage the weld after completion.
7. Open the cover of the oven (crucible) to expose the weld cavity.
8. Clean the cavity using the exothermic furnace cleaning tool, as necessary.
9. Insert an exothermic metallic disk into the weld cavity with the concave side facing downward to fit the shape of the weld cavity.
10. Remove the cap from an exothermic ignition charge container and pour the contents into the weld cavity.
11. Ensure that all of the fine ignition powder from the bottom of the ignition charge container is also poured lastly into the weld cavity.
12. Close the lid of the exothermic ignition oven (crucible) and place it over the wire with the copper sleeve and hold firmly against the pipe surface to be welded.
13. Wear protective gloves to prevent burns, and use the exothermic charge igniter to light the charge. **DO NOT USE MATCHES OR A TORCH.**
14. Hold the exothermic ignition oven (crucible) firmly for a moment allowing the weld to cool.
15. Remove the exothermic ignition oven (crucible) from the pipe and test the completed weld with a hammer. Avoid striking the wire directly.
16. After the weld has cooled completely, repair the pipe coating according to company procedures.

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### Installation of Exothermic Electrical Connections

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#### Pin Brazing

1. The pipe surface must be thoroughly cleaned to a bright shinny appearance and free of mastic, oil, and grease prior to pin brazing.
2. CAUTION – Never pin braze to a corroded pipe surface.
3. Select either a direct pin brazing lug or a threaded brazing pin for attachment to the pipe surface.
4. When using a direct pin brazing lug, the wire or cable must be prepared prior to pin brazing according to manufacturer instructions. Load the pin brazing lug and associated pin brazing ferule into the pin brazing gun.
5. Connect the pin brazing gun to a manufacturer approved power supply.
6. Pin braze the wire or cable and direct pin brazing lug to the pipe surface.
7. Test the completed pin braze with a hammer as performed with an exothermic weld. Avoid striking the wire or cable directly.
8. When using a threaded brazing pin, load the pin and associated pin brazing ferule into the pin brazing gun.
9. Follow item 5. above, and pin braze the threaded brazing pin to the pipe surface.
10. Test the completed pin braze with a hammer but avoid striking the threaded portion of the pin directly.
11. Attach the prepared wire or cable to the threaded brazing pin and secure with appropriate washer(s) and nut.
12. After the pin braze has cooled completely, repair the pipe coating according to company procedures.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

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## Operations and Maintenance Procedures

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### Installation of Exothermic Electrical Connections

#### RELATED PROCEDURES

0991 – Coating Application and Repair – Brushed or Rolled

1001 – Coating Application and Repair – Sprayed

1011 – External Coating Application and Repair – Wrapped

#### ABNORMAL OPERATING CONDITIONS

| AOC Main Category & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component (T/S)</li> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

Prepared by: SRCS

Approved by: Jeremy Reynolds

Date: 9/22/14

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| Revision Date: 10/22/08 | Version: 2.0 |

### Inspect or Test Cathodic Protection Bonds

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel inspect or test cathodic protection bonds that these devices are performing as designed.

It describes practices required to comply with §§192.465(c), and 192.491(a).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when inspecting or testing cathodic protection bonds, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger.

Ensure that all applicable safety equipment is being utilized as per company policy.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- 10 megaohm input impedance digital multimeter
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Interference Bonds

1. Access the test box or facility that contains the cathodic protection interference bond.
2. Visually inspect the equipment for signs of overheating (discolored wire or shunt material), corrosion that could cause connections to fail, insects, rodents, or other undesirable conditions.
3. Examine resistance wire or potentiometers for burned or broken wires that would indicate a lightning strike or power surge and repair as necessary.
4. If the test box or facility contains a shunt resistor designed to measure current, read the voltage across the shunt side pins and calculate the current flow across the shunt resistor. Record the voltage and polarity, and the calculated current values.
5. Verify that electrical current is flowing the intended direction using the polarity on the digital multimeter. This is performed by connecting the negative or "common" multimeter lead to the A side of the shunt resistor and the positive lead to the B side of the shunt resistor. If the polarity is positive, current is flowing from the A side to the B side of the shunt resistor.
6. If the test box or facility contains a diode, which only allows current flow in one direction, the electrons flow through the diode in the opposite direction of the indicating arrow stamped on the body of the diode. If the polarity and current test for the shunt resistor (in item 5. above) indicated the electron flow was in the same direction as the diode arrow, the diode may be shorted and additional maintenance may be required.

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| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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| <b>Revision Date:</b> 10/22/08 | Version: 2.0 |

### Inspect or Test Cathodic Protection Bonds

7. Compare all gathered data with historical values for the bond to determine if the bond circuit is performing within correct parameters.
8. If required, measure the pipe – to – soil potential of the pipeline or pipelines and determine if these values are within acceptable parameters.
9. If newly gathered data is not in agreement with historical values, the bond circuit may need to be repaired or replaced.

#### **Distribution Bonds**

1. Cathodic protection bonds designed and installed to extend or distribute cathodic protection from a “parent” piping system to a “child” piping system are tested in a similar fashion as interference bonds using the shunt resistor to measure voltage and calculate current flow across the bond to the “child” piping system.
2. If newly gathered and calculated values are similar to the historical values, the bond circuit is working properly.

#### **REPORTING/NOTIFICATION**

Complete documentation in accordance with Operation and Maintenance Manual.

#### **RELATED PROCEDURES**

0001 – Measure Structure–to–Electrolyte Potential

0011 – Conduct Close Interval Survey

#### **ABNORMAL OPERATING CONDITIONS**

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component (T/S)</li> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Inspect or Test Cathodic Protection Electrical Isolation Devices

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel inspect or test cathodic protection electrical isolation devices that these devices are operating as designed. It describes practices required to comply with §192.467.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when inspecting or testing cathodic protection electrical isolation devices, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger. Ensure that all applicable safety equipment is being utilized as per company policy.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- 10 megaohm input impedance digital multimeter
- Automotive battery circuit (12-volt wet-cell battery)
- Magnetic isolation tester with headphones
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Above Ground Isolation Devices

1. Perform a visual inspection of the isolation device for general condition, including corrosion, mechanical damage, or any other condition that might impair the operation of the device. Correct as necessary. (Note: Metallic based paints can cause shorting of isolation devices and should be avoided)
2. Measure the pipe-to-soil potential on both sides of the isolation device and confirm that the difference is adequate to assure positive isolation. (Note: Pipelines with cathodic protection on both sides of an isolation device can have the same potential on both sides and NOT be shorted. Connect an automotive battery circuit (12-volt wet-cell battery) with the negative terminal connected to the pipeline, and with the positive terminal connected to a temporary ground rod. Check the voltage on the side of the isolation device where the automotive battery circuit (12-volt wet-cell battery) is connected. If this side of the isolation device has a voltage value in excess of the minimum threshold, the isolation device is operating properly. Otherwise, the isolation device is shorted and must be repaired or replaced.

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| Prepared by: SRCS | Approved by: | Date: |
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### Inspect or Test Cathodic Protection Electrical Isolation Devices

3. A magnetic isolation tester with headphones can also be used to test for proper isolation by connecting the needle points to each side of the isolation device and listening for a 60 cycle AC power humming noise or a scratching sound when the needles are moved across the sides of the isolation device. Either sound confirms that the isolation device is performing properly.

#### Casing Spacers

1. This inspection/test assumes that cathodic protection test leads are installed on both the carrier pipe and the casing pipe. A vent riser attached to the casing can also be used for a test lead.
2. Read the pipe-to-soil potential of the carrier pipe and record the value.
3. Using an automotive battery circuit, connect the positive terminal of the battery to the casing vent or casing test lead. Connect the negative terminal to a temporary ground rod. DO NOT use the carrier pipe for the negative connection in case the casing and carrier are shorted.
4. Check the pipe-to-soil potential of the carrier pipe again.
5. If the carrier pipe-to-soil value has not changed, the casing spacers are performing properly and the casing is not shorted to the carrier pipe.
6. If the carrier pipe-to-soil value has shifted to a positive voltage value, the casing is shorted to the carrier pipe and excavation and repair must be scheduled.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

- 0001 – Measure Structure-to-Electrolyte Potential
- 0091 – Troubleshoot In-Service Cathodic Protection System

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component (T/S)</li> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline – Electric shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 06/25/08 | Version 2.0 |

### Install Cathodic Protection Electrical Isolation Devices

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#### SCOPE AND PURPOSE

This procedure is to ensure that cathodically protected pipelines are electrically isolated.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the cathodic protection electrical isolation devices are installed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Do not install cathodic protection electrical isolation devices if lightning is present.

Before attempting to install electrical isolation devices use a Radio Frequency Insulation tester across the two pieces of pipe material to be isolated.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Hand tools
- Flange Insulator kits
- Radio Frequency (RF) Insulation tester
- Other equipment and materials as needed

#### INSTRUCTIONS

##### Operator Qualification

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to install electrical isolation devices. Refer to the OQ Plan for specific qualification requirements.

##### Maintenance and Operation of Equipment

Check the batteries in the Radio Frequency Insulation tester before going into the field.

It is not recommended that a multimeter/voltmeter be used to test for resistance across insulated flange assemblies and fittings since the results will likely be unreliable, especially with pipe segments that are attached to buried facilities.

##### Installing an insulated flange assembly

1. Inspect the insulating gasket and flanges for defects.
2. Align flanges so that the faces are parallel to each other and the bolt holes line up. Do not force flanges into alignment using mechanical devices such as jacks or other tools that place excessive strain in the completed assembly.
3. Insert the full-face gasket between the flanges.
4. Insert several bolts, install nuts and tighten to hold the flanges in alignment. Insulating tubes and washers need not be installed on these bolts as these bolts will be removed later in this procedure.
5. Insert insulating tubes on remaining bolt holes.
6. Insert bolts through the insulating tubes.



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**Install Cathodic Protection Electrical Isolation Devices**

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7. Place insulating washers onto the bolts.
8. Place steel washers and nuts on bolts and hand tighten.
9. Remove the bolts installed in step 4 and repeat steps 5-8 for these bolts.
10. Partially tighten the bolts in sequence starting with the bolt at 12 o'clock, then 6 o'clock, then 3 o'clock, then 9, o'clock, etc. Depending on the size of the flange there may be 16 or more bolts. Repeat this process until all the bolts are properly tightened.
11. Check the effectiveness of the insulator by touching the two leads of the Radio Frequency Insulation tester to each side of the flange assembly.
12. If the Radio Frequency Insulation tester indicates there is electrical conductivity across the flange assembly, disassemble the flanges and start over at step 1.
13. If the assembly is to be buried, apply coating according to procedure #0991 or #1011, otherwise, apply coating according to procedure #1001.

**Installing an insulated, bolted, compression coupling (pipe joining)**

1. Inspect the surfaces of the pipe and coupling where the gasket is to seat to ensure they are free of grease, coating, scale, dirt or other materials. Remove any irregularities in the pipe that might damage the gasket. If the pipe ends are ragged, smooth them off to prevent damage to the gasket.
2. Apply soapy water to the pipe ends to aid in positioning the gasket without damaging it.
3. Install both the skirted gasket and the polyethylene insulator to one of the pipe ends. The middle sleeve must be positioned equally over both pipe ends. Leave no more than 1 inch gap between pipe ends.
4. Tighten the nuts sequentially as described above in step 10 for flanged fittings.
5. Check the effectiveness of the insulator by touching the two leads of the Radio Frequency Insulation tester to each side of the pipe assembly, check for conductivity across the fitting.
6. If the Radio Frequency Insulation tester indicates there is electrical conductivity across the fitting, disassemble the fitting and start over at step 1.
7. Soap test the coupling under operating pressure.
8. If the assembly is to be buried, apply coating according to procedure #0991 or #1011, otherwise, apply coating according to procedure #1001.

**Installing an insulated, stab-fitting, compression coupling (pipe joining)**

1. Clean pipe surfaces where coupling is to be installed. Ensure pipe is free of grease, coating, scale, dirt or other materials.
2. Disassemble the coupling and slide the end nuts onto each piece of pipe so that the threaded ends face each other.
3. Apply soapy water to gaskets position on the pipe ends in the same configuration that the gaskets were when disassembled.
4. Stab pipe ends into the coupling body until contact is made with the pipe end spacer.
5. Tighten end nuts using a smooth jawed wrench while holding the coupling body from rotating using a pipe wrench.
6. Check the effectiveness of the insulator by touching the two leads of the Radio Frequency Insulation tester to the pipe on each side of the coupling.
7. If the Radio Frequency Insulation tester indicates there is electrical conductivity across fitting, disassemble the fitting and start over at step 1.
8. Soap test the coupling under operating pressure.

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**Install Cathodic Protection Electrical Isolation Devices**

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9. If the assembly is to be buried, apply coating according to procedure #0991 or #1011, otherwise, apply coating according to procedure #1001.

**Installing a weld-in insulator (manufactured insulated pipe segment)**

1. Inspect the insulated pipe segment for defects.
2. Use a Radio Frequency Insulation tester to check for the absence of conductivity prior to welding.
3. Always use an API 1104 qualified welder to perform all welding functions.
4. Soap test the fitting under operating pressure after welding is completed and cooled.
5. Check the effectiveness of the insulator by touching the two leads of the Radio Frequency Insulation tester to the pipe on each side of the coupling.
6. If the Radio Frequency Insulation tester indicates there is electrical conductivity across fitting, the device is faulty and should be replaced.
7. If the assembly is to be buried, apply coating according to procedure #0991 or #1011, otherwise, apply coating according to procedure #1001.

**Installing an insulated threaded fitting (dielectric or insulating union) on a meter riser**

1. Inspect the insulating fitting for defects.
2. Apply thread compound to the meter riser.
3. Thread the non-insulated end of the insulating fitting onto the riser and tighten.
4. Thread the insulating end of the insulating fitting onto the pipe nipple downstream of the intended union position.
5. Install these types of fittings with the insulating end looking upwards to ensure positive identification in the future.
6. Tighten the insulated fitting using appropriate hand tools.
7. Check the effectiveness of the insulator by touching the two leads of the Radio Frequency Insulation tester to the pipe on each side of the coupling.
8. If the Radio Frequency Insulation tester indicates there is electrical conductivity across fitting, disassemble the fitting and start over at step 1.
9. Soap-test the fitting under operating pressure.
10. Apply coating according to procedure #1001.

**Installing an insulating meter swivel(s)**

1. If a dielectric or insulating union is used on a meter riser, an insulating meter swivel should not be required.
2. If a dielectric or insulating union is not used on a meter riser, an insulating meter swivel should be installed to isolate the meter set from fuel gas and other associated interior piping such that the buried gas system cathodic protection is not compromised.
3. Some gas system operators prefer to install an insulating meter swivel on both the inlet and outlet meter spuds in the case that one of the insulating meter swivels fails over time.
4. Tighten the meter swivel(s) against the meter spuds using new meter swivel seals.
5. Soap test the fitting under operating pressure after installation is completed.
6. Apply coating according to procedure #1001.

**REPORTING/NOTIFICATION**

Complete documentation in accordance with Operation and Maintenance Manual.

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| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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### Install Cathodic Protection Electrical Isolation Devices

#### RELATED PROCEDURES

- 0071 Inspect or Test Cathodic Protection Electrical Isolation Devices
- 0591 Leak Test at Operating Pressure
- 0641 Visually Inspect Pipe and Components Prior to Installation
- 0721 Joining of Pipe – Threaded Joints
- 0731 Joining of Pipe – Flange Assembly
- 0801 Welding
- 0811 Visual Inspection of Welds
- 0951 Installation of Pipe Above Ground
- 0991 Coating Application and Repair – Brushed or Rolled
- 1001 Coating Application and Repair – Sprayed
- 1011 External Coating Application and Repair – Wrapped
- 1041 Install Mechanical Clamps and Sleeves
- 1061 Installation of Customer Meters and Regulators – Residential and Commercial
- 1171 Installing Customer Meters – Large Commercial and Industrial

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Pipeline Damage</i></b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component (T/S, isolation device)</li> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Troubleshoot In-Service Cathodic Protection System

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel detect deficiencies with a cathodic protection system, that such issues are thoroughly investigated and remedied.

It describes practices required to comply with §192.465 (c) and Appendix D of Part 192, Sections I, III, and IV.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when deficiencies in a cathodic protection system are detected, that troubleshooting and associated remediation is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger.

Ensure that all applicable safety equipment is being utilized as per company policy.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- 10 megaohm input impedance digital voltmeter
- Electrical ammeter
- Copper-Copper-Sulfate reference electrode
- DC battery supply
- Temporary ground rod
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Test Station Troubleshooting

1. Whenever a cathodic protection test station indicates a pipe – to – soil reading value that is below required criteria, investigatory work must be performed in order to correct the situation.
2. Examine historical pipe – to – soil reading data in order to ascertain the extent of the discrepancy.
3. An abrupt decrease in pipe – to – soil readings for any type of cathodic protection system generally indicates either a faulty test station connection, or a foreign contact short.
4. Gradually decreasing pipe – to – soil readings for a galvanic anode cathodic protection system generally indicates normal degradation of the current output capacity of the installed galvanic anodes.
5. An abrupt decrease in pipe – to – soil readings for an impressed current rectified cathodic protection system generally indicates either a failed anode ground bed or a failed pipe coating system.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Troubleshoot In-Service Cathodic Protection System

6. Connect the DC battery with the positive terminal lead to the temporary ground rod, and the negative terminal lead to the pipeline to be protected.
7. Install the electrical ammeter into the DC battery circuit. Start at the highest range on the meter and work downward to prevent damage to the ammeter if the current output is higher than expected.
8. Connect the digital multimeter and the Copper Copper-Sulfate reference electrode to monitor the pipe – to – soil potentials on the pipeline being tested.
9. Record the current value on the ammeter.
10. Allow the current to flow for about one minute and then turn the current supply off.
11. When the current supply is turned off, immediately observe the digital multimeter voltage value and monitor the pipe – to – soil potential value of the pipeline.
12. The pipe – to – soil potential value should fall from the initially observed output voltage value and stabilize momentarily at the polarized voltage value.
13. If the polarized voltage potential value is within required criteria levels, and the current value is not too excessive, the testing is has been completed.
14. The number of anodes needed to produce the required protective current must now be determined and installed; otherwise the required increase in rectifier current output must be supplied.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

- 0001 – Measure Structure-to-Electrolyte Potential
- 0101 – Inspect Rectifier and Obtain Readings
- 0031 – Inspect and Monitor Galvanic Ground Beds/Anodes
- 0111 – Maintain Rectifier

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component (T/S)</li> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline – Electric shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| <b>B31Q Task # 0101</b> | Page 1 of 3  |
| Revision date: 9/12/13  | Version: 2.2 |

### Inspect Rectifier and Obtain Readings

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#### SCOPE AND PURPOSE

This procedure is to ensure adequate external corrosion protection for the pipeline systems. It describes cathodic protection inspection practices required to comply with §192.465(b).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that rectifier inspections are performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Do not conduct the survey during a lightning storm. Electricity from the lightning could travel onto the pipe and result in death or injury when electrical contact is made with the pipe during the rectifier inspection.

Never touch the rectifier before first checking for a short. Any contact with a shorted rectifier could result in a severe electrical shock.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Ammeter/Voltmeter/Multi-meter
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

- Ensure the multi-meter batteries are adequately charged
- Before making any contact with the rectifier, verify that the exterior of the rectifier is free of stray voltage using one of the methods described below:
  - Using a multi-meter, set meter to read voltage, place one lead on the rectifier case and the other on the ground. If there is a voltage reading, do not touch the rectifier -- there may be a short. Refer to Procedure #0111 for rectifier repair and replacement instructions.
  - Using a voltage pen or other device capable of alerting the user of the presence of stray voltage, touch the device to the rectifier case. If the device gives an indication of voltage, do not touch the rectifier – there may be a short. Refer to Procedure #0111 for rectifier repair and replacement instructions.

#### Checking rectifier condition

- Check the physical condition of the outside of the rectifier case.
- Open the rectifier and check for anything that needs attending to, like insect nests, excess moisture, odors that may indicate over-heating and over-all condition. Check the anode and pipe cable connections for tightness. Verify that the “Coarse” and “Fine” taps have not changed since the last inspection. Record the tap settings.

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### Inspect Rectifier and Obtain Readings

Note: The following steps assume that readings are made with a hand-held ammeter/voltmeter/multimeter. Readings can also be taken from the voltage and current meters of the rectifier, if present and accurate.

#### Checking rectifier voltage

- e. Select the proper meter settings and range (Set to read DC voltage).
- f. Connect the positive voltmeter test lead to the positive or anode output terminal of the rectifier. Connect the voltmeter negative or common test lead to the negative or pipe output terminal of the rectifier. Record the voltage.
- g. If there is no voltage, check that the power is turned on and check the fuse (or circuit breaker). If power is on and the fuse or circuit breaker is OK, report the problem to the field Supervisor.

#### Checking rectifier output current

- h. Select the proper meter settings and range (Set to read DC millivolts).
- i. Locate the shunt and verify the shunt amperage and millivolt rating
- j. Measure the voltage across the shunt.
- k. Calculate the current output by multiplying the millivolt reading across the shunt by the shunt amperage rating and divide by the shunt millivolt rating. Example: With a shunt rated at 50mV and 15A and a meter reading across the shunt of 34 mV:  

$$34\text{mV} \times 15\text{A} / 50\text{mV} = 10.2 \text{ Amps.}$$
- l. Record the current on the proper forms.

#### Optional – Read rectifier current input

- m. If the rectifier has a meter indicating rectifier input current, record that on the proper forms.

### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

### RELATED PROCEDURES

- 0001 – Measuring Structure to Electrolyte Potential
- 0111 – Maintain Rectifier

### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component (Rectifier)</li> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Inspect Rectifier and Obtain Readings

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|   |  |
|---|--|
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"><li>• Low odorization</li><li>• Over odorization</li><li>• Odor complaint</li></ul> | <ul style="list-style-type: none"><li>➤ Protect life &amp; property</li><li>➤ Prevent accidental ignition</li><li>➤ Notify appropriate personnel</li><li>➤ Locate source/cause of AOC</li><li>➤ Make repairs/eliminate AOC</li></ul> |
|---|--|



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### Maintain Rectifier

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel install, inspect, and maintain a cathodic protection rectifier, that it is performed in order to ensure that the rectifier is operating as designed in order to cathodically protect the associated pipeline facility. It describes practices required to comply with §192.465.

#### RESPONSIBILITY

The [City of Thomasville Gas Superintendent](#), or other designee, is responsible to ensure when installing, inspecting, and maintaining a cathodic protection rectifier, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger.  
Ensure that all applicable safety equipment is being utilized as per company policy.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- 10 megaohm input impedance digital multimeter
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Installation

**CAUTION! SHOCK HAZARD!** The rectifier is powered by high voltage A.C. power. Whenever the rectifier case is opened, there is a potential shock hazard to personnel performing rectifier maintenance. Proper electrical safety equipment should be used whenever a rectifier is being inspected and/or maintained.

1. After the cathodic protection rectifier has been physically installed and the input AC power supply has been connected and tested, the remainder of the rectifier circuit can be attached, tested, and adjusted.
2. Ensure that rectifier DC output cables are installed in conduit or other means of protecting the wire and associated insulation, that a ground bed shunt resistor box with the required anode connections is completed, and a means of securing the rectifier case is installed.
3. Before the DC output cables are connected, set the tap settings to the lowest (Coarse 1 and Fine 1) positions, and turn the rectifier on.
4. Using a digital multimeter capable of indicating current polarity, attach the negative or "common" lead terminal of the multimeter to the negative ( - ) output terminal of the rectifier, and the positive lead terminal of the voltmeter to the positive ( + ) output terminal of the rectifier. Verify that the

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### Maintain Rectifier

polarity marked on the rectifier front panel is correct. Rarely, rectifiers have been shipped from the manufacture with incorrect wiring inside. This step eliminates this possibility.

5. Turn the rectifier to the "Off" position.
6. Attach the positive lead terminal of the rectifier to the cable attached to the anode ground bed. If this cable is directly buried, the insulation sheath must be in "like new" condition. Any damage that exposes the bare wire will cause the cable to radiate current just like the anode ground bed causing the cable to fail almost immediately. Attach the negative lead terminal of the rectifier to the cable attached to the pipeline. This connection procedure MUST be performed exactly as stated. Incorrect wiring connections can cause premature pipeline failure.
7. Turn the rectifier on.
8. Using either, historical voltage/current values, or design and current requirement test values, adjust the rectifier taps to allow the rectifier to produce the DC output voltage and current required to protect the pipeline. For each change of tap settings, first turn the rectifier off, make the changes, and then turn the rectifier back on.
9. If the pipeline requires current values that are high, or if the pipeline is poorly coated or bare, do not attempt to get the target pipe – to – soil potentials correct on the first attempt at rectifier adjustment. Adjust the rectifier to a setting that will provide approximately 75 % of the required current and allow the system to operate at this setting over night, or longer, to allow the pipeline to polarize before final rectifier adjustments are made.
10. After the pipeline has polarized, complete the tap adjustment steps necessary for the rectifier to provide the required DC current and voltage output combination to achieve protective pipe – to – soil potentials. The DC output voltage is controlled by the tap settings, and the anode ground bed –soil – pipe coating circuit resistance controls the DC output current level
11. If more current is required, increase the DC output voltage.
12. After the rectifier has been operating at the operational DC output levels for 24 hours, check the rectifier for excessive hum that might indicate excessive current output, odors that indicate over – heated wires or other electrical components, and any other obvious problems.
13. Adjust the DC output of the rectifier to achieve correct pipe – to – soil potentials without over driving the system. Excessive DC output voltage and current causes coating damage and increases the possibility of interference problems. Find the lowest pipe – to – soil potential on the pipeline, and adjust the rectifier to keep that pipe – to – soil potential well within required compliance levels.

### Troubleshooting

1. Visually inspect the case for indication of damage and/or vandalism.
2. The AC voltage and circuit breaker or fuses should always be checked before using more complex troubleshooting procedures.
3. Before making any contact with the rectifier, verify that the exterior of the rectifier is free of stray voltage using one of the methods described below:
  - i. Using a multi-meter, set meter to read voltage, place one lead on the rectifier case and the other on the ground. If there is a voltage reading, do not touch the rectifier. Disconnect the power at the main input power supply disconnect prior to beginning investigation into the cause of stray voltage.
  - ii. Using a voltage pen or other device capable of alerting the user of the presence of stray voltage, touch the device to the rectifier case. If the device gives an indication of voltage,

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### Maintain Rectifier

do not touch the rectifier. Disconnect the power at the main input power supply disconnect prior to beginning investigation into the cause of stray voltage.

4. Perform a complete visual inspection first. Many rectifier problems can be identified through visual inspection. As the rectifier is approached, listen for the hum associated with the transformer operation. If it is there, the power is on and the high voltage side is working. Check for blown circuit breakers, blown fuses, and test the cable connections for tightness first.
5. Rectifiers are shipped with a schematic diagram, usually located in one of the doors. Personnel can refer to this information for guidance.
6. Check the output surge suppresser, or lightning arrester for signs of operation – burn marks, missing pieces, or complete failure. Surges often enter a rectifier from the pipeline.
7. Troubleshooting should be performed from the DC voltage side first. Check for DC output voltage. If it is near normal, check the DC current output. If the DC current is near “zero”, look for a blown DC output fuse, or a cut cable.
8. Using the digital multimeter, test the voltage across the tap bars. This is the AC output directly downstream of the transformer. This voltage should be 20 % to 50 % higher than the expected DC output voltage at the DC connection cables to the anode ground bed and the pipeline.
9. If the rectifier has selenium plates, (the green plates stacked together with 4 wires coming out), examine the plate surfaces for burned spots that might indicate a power surge or lightning strike problem. Rectifier plates and diodes are usually soldered into the circuits and do not lend themselves well to field replacement.
10. The list below represents the troubleshooting sequence used to test the entire electrical circuitry of a rectifier. When each sequential part of the electrical circuit is found to be operational, the next successive item on the list is likely where any electrical circuit problem exists.
  - i. High voltage input, lightning arrestor, circuit breaker
  - ii. Transformer and taps.
  - iii. Full wave rectifier circuit, plates, diodes.
  - iv. Measuring circuit, voltmeter, ammeter, shunts, switches.
  - e. Output circuit, fuses, lightning arrestor, cable terminals.

### Removal From Service

1. Turn off all input AC power supplies.
2. Disconnect all AC input voltage wires, label them as required, and place wire nuts or tape over any exposed wire ends.
3. Disconnect the positive and negative output cables to the anode round bed and pipeline, and label them as required.
4. Remove the rectifier cabinet from the support mechanism.
5. Remove conduit nuts and ground cables, if installed.

### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

### RELATED PROCEDURES

- 0001 – Measure Structure – to – Electrolyte Potential
- 0101 – Inspect Rectifier and Obtain Readings

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### Maintain Rectifier

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component (T/S)</li> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline – Electric shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 4/14/08  | Version: 2.1 |

### Visual Inspection for Atmospheric Corrosion

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#### SCOPE AND PURPOSE

This procedure is to ensure adequate external corrosion protection for the pipeline systems. It describes corrosion protection inspection practices required to comply with §192.479 and §192.481.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that visual inspection for atmospheric corrosion is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Wear a hard hat and high visibility safety vest when exposed to vehicular traffic or construction activity. When arriving at the location, be aware of any environment that can pose a threat to personnel safety.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- System leak grading criterion
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform visual inspection for atmospheric corrosion. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

- a. While approaching the pipeline or portion of pipeline, perform a visual examination of the area for signs of conditions that may contribute as a factor to atmospheric corrosion.
- b. Visually and physically examine above-ground facilities for the presence of atmospheric corrosion including, but not limited to:
  - General “uniform” corrosion – large areas of pipe are rusting or pitting uniformly
  - Localized “non-uniform” corrosion – pipe is rusting or pitting only in one or more specifically defined areas
  - Faded or thinning paint or coating
  - Flecking or small patches of paint or coating missing, or light rust bleed through
  - Paint or coating totally absent from entire section or large section of facility
  - Paint or coating totally absent from entire section or large section of facility and a percentage of pipe diameter of the original wall thickness has eroded

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| <b>B31Q Task # 0141</b> | Page 2 of 2  |
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### Visual Inspection for Atmospheric Corrosion

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

- 0191– Measure Atmospheric Corrosion
- 0991– Coating Application and Repair-Brushed or Rolled
- 1001– Coating Application and Repair-Sprayed
- 1011--External Coating Application and Repair-Wrapped

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>                                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Stray current on a pipeline</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| <b>B31Q Task #0161</b>         | Page 1 of 2  |
| <b>Revision Date:</b> 10/22/08 | Version: 2.0 |

### Visual Inspection for Internal Corrosion

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel either perform hot tapping procedure or otherwise remove segment of gas piping and associated fittings, that the internal surface of these facilities are visually examined for evidence of internal corrosion. It describes practices required to comply with §§192.475, 192.485, 192.487, and 192.489.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when performing hot tapping procedures or otherwise removing segments of gas piping and associated fittings, that the internal surface of these facilities are visually examined for evidence of internal corrosion, and that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger.  
Ensure that all applicable safety equipment is being utilized as per company policy.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

1. Whenever a hot tap is performed on a metallic gas pipe, the pipe coupon should be retained and visually examined for evidence of internal corrosion.
2. Whenever a segment of gas pipe is removed or otherwise taken out of service, the internal surfaces should be examined for evidence of internal corrosion.
3. Indications of internal corrosion require a thorough investigation of adjacent pipe, both longitudinally and circumferentially, in order to discover the actual extent of internal corrosion.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Visual Inspection for Internal Corrosion

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

0151 – Visual Inspection of Buried Pipe and Components When Exposed

0181 – Measure Internal Corrosion

1081 – Tapping a Pipeline (Tap Diameter 2 Inch and Less)

1091 – Tapping a Pipeline (Tap Diameter greater than 2 Inch)

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | Reactions to AOC, as appropriate  |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>                                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline</li> </ul>               | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |



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### Measure External and Atmospheric Corrosion

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities necessary to measure and characterize external corrosion. It includes an investigation for determining the extent of corrosion to buried pipe and atmospheric corrosion to above ground pipe. It describes practices required to comply with §§192.459, 192.481 and 192.487.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that measuring external and atmospheric corrosion is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Pipe Pit Depth Gauge
- Company Records
- Hand Tools
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### Measurement Steps

- Examine pipe for evidence of external corrosion. Investigate both circumferentially and longitudinally along the pipe for a reasonable distance measured laterally beyond the corroded area. The strength integrity of the pipe is dependent on the longitudinal extent of the corroded area in relation to the maximum wall thickness loss. Check for corrosion at any damaged, deteriorated, or disbonded coating, soil to air interfaces, and pipe exposed to air, moisture and pollutants.
- Clean pipe removing dirt, scale, rust or other foreign matter as much as safely possible. Be careful not to encounter possible leaking gas.
- Take an external measurement of pipe wall thickness utilizing a pipe pit depth gauge.
  - General operating instructions for mechanical pipe pit depth gauge:
    - Maintain pit gauge in good mechanical condition. Pit gauge should not be bent, misaligned, warped or damaged.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Measure External and Atmospheric Corrosion

- o Align the straight edge of the pit gauge along the uncoated surface of pipe or fitting being measured.
  - o To measure individual pit depths, insert the tip of the depth probe to the bottom of the pit while keeping the straight edge of the pit gauge flat against original metal.
  - o Determine depth by reading the top edge of the depth probe indicator. The depth reading should be read in decimal equivalent inches.
  - o Determine the remaining wall thickness by subtracting the pit depth from the original wall thickness.
- d. Reference company procedures for acceptable limits of metal loss.
- e. Perform remedial action based on remaining wall thickness.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0141 – Visual Inspection for Atmospheric Corrosion

0151 – Visual Inspection of Buried Pipe and Components When Exposed

0161 – Visual Inspection for Internal Corrosion

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>                                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline</li> </ul>               | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Measure Internal Corrosion

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel measure the extent of internal corrosion of piping and associated fittings that is performed to ensure accuracy of specific corrosion pit measurement and extent. It describes practices required to comply with §§192.474, and 192.487.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when the extent of detected internal corrosion of piping and associated fittings is measured, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger.  
Ensure that all applicable safety equipment is being utilized as per company policy.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Sonograph instrument
- Pit depth gauge/deflection indicator
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

1. Clean the pipe and/or fitting sample by removing burrs, corrosion deposits, dirt and coating.
2. Use pit depth gauge, with a pit-measuring tip small enough to reach the bottom of the corrosion pit being examined.
3. The body of the pit depth gauge must lay flat on the internal surface being inspected. Holding the pit depth gauge firmly, push the tip into the different pits and record each pit depth result.
4. If a deflection indicator is used, thoroughly clean the pipe and/or fitting sample(s). Lay the sample with the outside of the pipe on a smooth, flat inspection surface. Using a pointed tip on the deflection indicator that will reach the bottom of the smallest pit, position the sample under the deflection indicator and measure to a smooth pipe or fitting surface that does not have any corrosion pits. This will establish the wall sample thickness. Adjust the dial to read "zero". Raise the dial tip, do not drag it on the surface of the pipe or fitting, and move the sample into position allowing the tip to move into the bottom of the pit. Read the difference between the "zero" on the dial ace, and the reading in the bottom of the subject pit. Record the information obtained.
5. After completely removing an ample amount of pipe coating and any associated mastic material, use a sonograph instrument to measure pipe wall thickness on either a pipe or fitting sample in the field, or from removed samples. Turn the sonograph instrument on, and using the instrument calibration block, that most closely matches the assumed pipe wall thickness, apply a small

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### Measure Internal Corrosion

amount of required gel to the cleaned pipe or fitting surface and again test the instrument for calibration.

6. Apply the required instrument gel to the general pipe or fitting surface area to be tested. Depending on the transducer and the pipe/fitting wall thickness, the transducer slit/window should be parallel or perpendicular to the pipe or fitting length.
7. Several individual tests will have to be performed unless the instrument has "B Scan" capabilities which allows the transducer to be moved across the pipe or fitting surface while the instrument obtains readings and displays the results on a graph. With an instrument without "B Scan", the transducer will have to be exactly over a pit to register the associated pipe or fitting thickness. Document all readings, recording good pipe wall thickness readings along with defect values.
8. If the sonograph readings indicate that the pipe or fitting wall is reduced to less than 30 % of its original thickness, it is considered "unserviceable", and must be replaced. Multiple pits, close enough together to affect pipe wall mechanical strength should be addressed appropriately.
9. With all cases of internal corrosion, the problem causing corrosion in one section of pipe might be common to the entire piping system and must be thoroughly investigated.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

0151 – Visual Inspection of Buried Pipe and Components When Exposed

0161 – Visual Inspection for Internal Corrosion

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>                                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline</li> </ul>               | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Measure and Characterize Mechanical Damage on Installed Pipe and Components

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel measure and characterize mechanical damage to installed pipe and components that this effort is performed according to accepted gas industry standards. It describes practices required to comply with §§192.614 (c) (6) and 192.703.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when measuring and characterizing mechanical damage on installed pipe and components, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Hand Tools
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

- a. Prepare Surface
  - i. Remove dirt, debris, and loose coating.
  - ii. Clean pipe surface.
- b. Characterize
  - i. Cracks
    - Cracks of any type in gas piping and components are unacceptable since future leakage is typically eminent. Gas piping and components that are affected by cracking may be considered unserviceable.
  - ii. Dents
    - This type of mechanical damage is commonly caused by motorized machinery and the extent of damage should be measured in order to determine the exact cause of damage.
    - Dents in steel exhibit no loss of metal and the material surface is left smooth. Characterization of dents is typically confined to whether the inside flow diameter has been reduced beyond serviceability and whether the facility has been stressed to a point that could cause future failure.
    - Dents in polyethylene pipe are typically treated the same as gouges.

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**Measure and Characterize Mechanical Damage on  
Installed Pipe and Components**

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- iii. Gouges
  - o This type of mechanical damage is commonly caused by motorized machinery and the extent of damage should be measured in order to determine the extent of damage.
  - o Gouges in steel exhibit loss of metal and the material surface is often left rough and or sharp with grooves in the direction of the moving machinery causing the damage. Gouges may, but do not always, reduce the internal flow diameter.
- c. Measure
  - i. Cracks
    - o Some cracks in steel are readily visible but most must be detected using radiographic, ultrasonic, dye penetrant, or magnetic particle methods of non-destructive testing in order to measure and characterize the anomaly.
  - ii. Dents
    - o Dents should be tested using radiographic, ultrasonic, dye penetrant, or magnetic particle methods of non-destructive testing in order to be properly characterized.
  - iii. Gouges
    - o Measurement of steel gouge depth can be performed using a depth gauge or by use of a sonogram instrument in order to determine the extent of metal loss.
    - o Gouges in polyethylene pipe and fittings that exhibit loss of wall thickness greater than or equal to 10 percent, ( $\geq 10\%$ ), may be characterized as an unserviceable facility that must be replaced.

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### Measure and Characterize Mechanical Damage on Installed Pipe and Components

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

- 0151 – Visual Inspection of Buried Pipe and Components When Exposed
- 0201 – Visual Inspection of Installed Pipe and Components for Mechanical Damage
- 0601 – Radiographic Testing
- 0611 – Liquid Penetrant Testing
- 0621 – Magnetic Particle Testing
- 0631 – Ultrasonic Testing
- 0801-0811 – Welding & Visual Inspection of Welding and Welds
- 1071 – Repair of Steel Pipe by Grinding

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Pipeline Damage</i></b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component</li> <li>• Low structure-to-electrolyte potential</li> <li>• Stray current on a pipeline</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Inspect, Test and Maintain Sensing Devices

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to ensure the integrity of the piping system when inspecting, testing, and maintaining sensing devices.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that inspecting, testing, and maintaining sensing devices are performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger.  
Ensure that all applicable safety equipment is being utilized as per company policy.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- 10 megaohm input impedance digital multimeter
- Pressure switch
- Pressure transducer
- Temperature transducer
- Differential Pressure transducer
- Laptop computer with software
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Pressure Switches

1. Connect the digital multimeter to the pressure switch wiring circuit and monitor the circuit current while varying the sensor input pressure throughout its operating range on a test bench.
2. Confirm that the pressure switch triggers at the correct gas pressure.
3. If the pressure switch set or trigger point is adjustable, perform a set or trigger point adjustment at this time, as required.
4. Reseal the set point adjustment access, as necessary.
5. If an electronic circuit monitors the pressure switch in the field, and the set or trigger point is adjustable by electronic means, set up field test equipment in order to observe and modify the set or trigger point.
6. As gas system pressure increases through the pressure switch range, adjust the set or trigger point to ensure that the local or remote pressure monitor is working in acceptable parameters.



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### Inspect, Test and Maintain Sensing Devices

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#### Pressure Transducer

1. Pressure transducers are usually an analog device that has a variable internal resistance value.
2. Connect the digital multimeter to the pressure transducer wiring circuit either on the bench or in the field and monitor the circuit current. That internal resistance of the pressure transducer must be added to total circuit resistance so that the full 20 mA current can flow to the circuit receiver. In these circuits, 4 mA values are usually recognized as a "0" pressure or "no flow" conditions. As the gas system pressure increases, the internal resistance value of the sensor decreases so that at full sensor rated operating pressure, the circuit will flow 20 mA.
3. For digital output pressure transducer circuits, the circuit interpretation and reaction can take different forms. The interface circuit may read the resistance output value from the pressure transducer, or the controlling circuit may furnish a calibrated output voltage and read the voltage drop associated with the varying circuit resistance value. Typically, an electronic interface is required to test or calibrate this equipment. The input pressure to the pressure transducer must be monitored using an accurate pressure gauge and the corresponding output signal delivered to the monitoring station must be verified for agreement.
4. Pressure transducers with output values in units of "psig" or "psia" are calibrated differently. Depending on the geographic altitude of the gas system facilities, a pressure transducer may display varying output values. A pressure transducer with output values in units of "psig", when removed from the piping system and exposed to the atmosphere, should display an output value of "zero". A pressure transducer with output values in units of "psia", when removed from the piping system and exposed to the atmosphere, should display an output value corresponding to the local atmospheric pressure conditions
5. Pressure transducer calibration using the appropriate instruments requires the sensor or transducer to be exposed to atmospheric pressure. The corresponding pressure transducer output circuit is adjusted to either "zero" for "psig" instruments, or to local "atmospheric pressure" for "psia" instruments.
6. The pressure transducer is then exposed to a known, calibrated pressure – near system operating pressure is desirable – and the pressure transducer output circuit is adjusted to this gas pressure value. This procedure is known as "span adjustment".

#### Temperature Transducer

1. Temperature transducers operate using a thermocouple inside a metal tube that is inserted into the gas flow stream. They may be mounted in a thermowell or similar device to protect the fragile tube from damage caused by contaminants in the gas flow stream. To be accurate, the probe, or thermowell, must be exposed to the center of the gas flow stream. As the gas flow stream temperature changes, the voltage output or resistance characteristics of the thermocouple change to reflect the gas flow stream temperature conditions.
2. Test the temperature transducer by either measuring the voltage output, usually in millivolts, or the resistance of the probe and compare it with the appropriate manufacturer table indicating temperature curves vs. output voltage or resistance value.
3. Calibration is performed by exposing the probe to a known temperature, and adjusting the output circuit voltage or receiver values to correspond with the field conditions. Use an agitated ice water bath to expose the thermocouple probe to a value near 32 degrees Fahrenheit. Test the temperature with a separate, calibrated, thermometer. Adjust the output or receiver value to correspond with the measured temperature. When this step is complete, expose the

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### Inspect, Test and Maintain Sensing Devices

thermocouple probe to an elevated temperature, in the 100 degree Fahrenheit range and allow the output reading to stabilize.

4. Adjust the output or receiver to correspond with the measured temperature. This completes the "span adjustment".

#### Differential Pressure Transducer

1. Differential transmitters measure two pressure values, compare them, and display the difference, or differential value. Differential pressure values are a measurement of pressure drop across a fixed resistance. Differential pressures are measured across orifice plates to measure flow, or across meters to measure efficiency. Accurate calibrated gauges are required to measure differential pressure.
2. Testing and calibrating differential pressure transducers requires either a pair of calibrated mechanical gauges, or a calibrated electronic differential gauge. Use the correct gauge tap locations on the gas piping system for installation of the gauges. Placement too far upstream or too far downstream will result in errors.
3. METHOD 1 – install one of the calibrated mechanical gauges upstream of the differential pressure transducer. Install another calibrated mechanical gauge on the downstream side of the differential pressure transducer. Both calibrated mechanical gauges should be connected at the same time – don't try to move one gauge from one side to the other to obtain the readings. Read both gauges simultaneously. The positive value difference in gauge pressure reading is the differential pressure across the differential pressure transducer. Record this value, and adjust the output of the differential pressure transducer to correspond to the calculated value.
4. METHOD 2 – Install one hose fitting from the calibrated electronic differential gauge to the upstream side of the differential pressure transducer, and install the other hose fitting to the downstream side of the differential pressure transducer. If the instrument requires that one hose fitting be on the higher-pressure side, install the hoses accordingly. Read the differential pressure value and record it. Adjust the output of the differential pressure transducer to correspond to the observed calibrated electronic differential gauge value.

#### Repair/Replacement of Sensing Devices

1. Repair and replacement of sensing devices may require opening the gas flow stream. If instrument shut – off valves are available, use them to isolate the device to be repaired/replaced. Otherwise, isolate the gas piping segment containing the device.
2. Disconnect the device wiring and remove the device from the piping system, usually using a threaded connection or a compression fitting. Sometimes the wiring is specific to the device and must be reused or replaced. Install the replacement device in the reverse order of removal. Use pipe compound or Teflon tape on threaded fittings. Test for leaks after gas pressure has been restored. Replace the wiring connections and use correct electrical connections and insulation. Re – test device output values and set points.

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## Operations and Maintenance Procedures

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### Inspect, Test and Maintain Sensing Devices

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

None

#### ABNORMAL OPERATING CONDITIONS

| <b><i>AOC Main Category</i></b> & Examples of Specific AOCs  | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component</li> <li>• Stray current on a pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Manually Opening and Closing Valves

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#### SCOPE AND PURPOSE

This procedure is to ensure the proper manual operation of valves (opening and closing). This is not applicable to throttling valves for flow control (Task #0311).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that valves are operated as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Do not operate valve if lightning is present.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Valve key wrench
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform manual operation of valves. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### **a. Prior to Opening or Closing a Valve**

- Identify the valve(s) to be operated.
- Identify the valve type (plug, ball, and gate), as the valve type will have a bearing on “how” this valve is operated (1/4 turn, multiple turn, etc).
- Confirm that the valve(s) chosen is the correct valve(s) to control the desired segment of pipeline.
  - If the valve(s) is an emergency valve, verify that it is clearly identified and documented as an emergency valve.
- Determine whether the valve(s) is:
  - Normally Open, or
  - Normally Closed
- If possible, notify the following personnel that may be affected by this operation:
  - Operating Personnel
  - Customers

##### **b. Opening of Valves**

- Verify the original position of the valve(s) before operating.
- Ensure that the valve is free of visible debris, corrosion, or damage that may hamper the operation of the valve.
- Verify that:
  - All work has been completed and the valve(s) is ready to be opened;

### Manually Opening and Closing Valves

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- That any and all meter sets affected by this operation have been turned off at the service riser; and,
- Appropriate personnel are notified.
- Using the appropriate tool, slowly open the valve(s).
- Verify the segment involved is operating at its correct pressure.
- Perform “lock-out” “tag-out”, as required by Operation and Maintenance Manual.

#### c. Closing of Valves

- Verify the original position of the valve(s) before operating.
  - “Valve-stops”, common in larger valves, enable the user to determine the position of the valve(s) – Turn clockwise to “Close” and counter-clockwise to “Open”.
  - Small valves at service risers may or may not be equipped with “valve-stops”, but the position of the valve can be determined by observing the position of the wrench-tab in relation to the service riser.

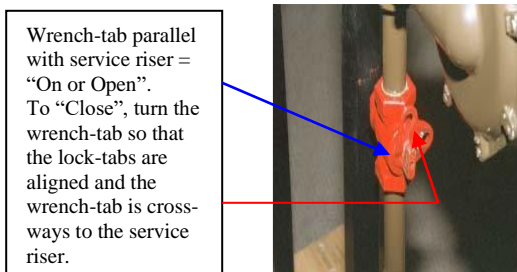


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- Ensure that the valve(s) is free of visible debris, corrosion, or damage that may hamper the operation of the valve(s).
- Using the appropriate tool, close the valve(s).
- Perform “lock-out” “tag-out”, as required by Operation and Maintenance Manual.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Manually Opening and Closing Valves

#### RELATED PROCEDURES

0331 – Valve – Visual Inspection and Partial Operation

0341 – Valve – Preventive Maintenance

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Flow Rate Deviation</b> <ul style="list-style-type: none"> <li>• No Flow</li> <li>• Unplanned Decrease in Flow</li> <li>• Unplanned Increase in Flow</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision Date: 10/22/08 | Version: 2.0 |

### Adjust or Monitor Flow or Pressure – Manual Valve Operation

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel adjust and monitor gas flow or pressure by manually operating valves that this operation is performed in a manner that ensures protection of downstream gas facilities from overpressure conditions. It describes practices required to comply with §192.201.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when adjusting and monitoring gas flow or pressure by manually operating valves, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger.  
Ensure that all applicable safety equipment is being utilized as per company policy.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Bypass valve keys and/or wrenches
- Pressure gauges
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

1. Ensure by using company maps and records that the proper valve to be used for adjustment and monitoring of gas flow or pressure is identified correctly.
2. Install a pressure gauge of the proper pressure span just downstream of the identified valve to be operated.
3. Ensure that the Maximum Allowable Operating Pressure (MAOP) of the downstream piping facilities is known before operating the identified valve.
4. Prior to operating the identified valve, ensure that notification to management and/or operations personnel of the intent to adjust and monitor flow or pressure using a valve has been communicated.
5. Manually operate the identified valve in order to control downstream pressure at or below the normal system operating pressure by throttling the identified valve open when normal system pressure falls, and throttling the identified valve closed when normal system pressure increases, as identified on the gauge.
6. Continue performing the throttling effort until manual valve operation to adjust and monitor gas flow or pressure is no longer necessary. At this point, fully close the identified valve, lock the valve into the closed position if required, and carefully remove the gauge.
7. Properly seal, cap, or plug the gauge tap fitting to a gas tight condition.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Adjust or Monitor Flow or Pressure – Manual Valve Operation

8. Manual valve throttling must be consistently attended during the entire process in order to ensure protection from over pressuring of downstream gas facilities. NEVER LEAVE AN IDENTIFIED BYPASS VALVE UNATTENDED DURING MANUAL OPERATION TO ADJUST AND MONITOR FLOW AND PRESSURE.
9. Gas flow rate can only be accurately adjusted and monitored using a properly sized gas metering device installed downstream of the gauge.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

0301 – Manually Opening and Closing Valves

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Flow Rate Deviation</i></b> <ul style="list-style-type: none"> <li>• No Flow</li> <li>• Unplanned Decrease in Flow</li> <li>• Unplanned Increase in Flow</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |



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### Valve Corrective Maintenance

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel repair, refurbish, replace valves, other than service riser valves upstream of customer meters, that these efforts are performed in a safe manner and according to valve manufacturer recommendations. It describes practices required to comply with §192.747 (b).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when performing repair, refurbishment, or replacement of valves, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Valve actuation/operation tools, as necessary
- Valve lubrication tool/gun, as necessary
- Valve flush/lubricant, as necessary
- Flange separating tool, as necessary
- Routine hand tools
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### Maintenance Steps

- a. Polyethylene Ball Valve Refurbishment/ Repair
  - Polyethylene ball valves are not typically manufactured with lubrication ports and these valves utilize internal Teflon-type seals to achieve positive shut off.
  - Excessive torsional loading can damage valve end fusions and excessive torque can damage internal valve parts. Polyethylene ball valves that cannot be operated or cannot be shutoff to a gas tight position should be replaced.
- b. Steel Ball/Plug Valve Refurbishment/Repair
  - Steel ball valves exhibiting external corrosion, and/or outside force damage, may cause valve leakage that should be promptly investigated.

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| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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### Valve Corrective Maintenance

- Partial valve operation should first be performed; however, any valve that will not operate should not be subjected to forced operation using a “cheater” since this practice can cause permanent valve damage and potential hazardous leakage.
  - Internal icing, foreign material, and corrosion can cause a steel ball or plug valve to be difficult to operate.
  - Some steel ball valves are manufactured with lubrication ports, while most steel plug valves are manufactured with lubrication ports. If lubrication ports are available, replace any damaged lubrication ports before proceeding. Caution should be taken when replacing lubrication ports that are under gas pressure.
  - A valve lubrication tool/gun equipped with a pressure gauge can be used as a troubleshooting tool when operated according to manufacturer recommendations.
  - Attempt to lubricate and partially operate the valve. If the valve will not accept lubricant, valve flush can be used with the lubrication tool.
  - Caution should be taken when injecting these materials as excessive flush/lubricant may travel downstream. Only enough flush should be used to displace old valve lubricant. Follow the valve flush manufacturer’s recommendations for “soak” time.
  - After “soak” time, attempt to partially operate the valve. If the valve appears to remain seized, lubricate the valve and again attempt partial operation. Use only enough lubricant to displace the valve flush. If partial operation is achievable, attempt full open/close operation as long as a gas service outage will not result.
  - If gland seals are present, ensure that gland seals are leak tight.
  - A plug valve that is not under gas pressure usually can be disassembled in place and repaired prior to final lubrication.
- c. Steel Ball/Plug Valve Replacement – Flanged
- Gas pressure should be reduced or eliminated prior to removal and replacement of a valve.
  - Piping support may be required after excavation of the valve.
  - Flanged valves should be removed by loosening the flange bolts leaving one or two bolts in place until just prior to complete valve removal.
  - Ensure that new bolts, washers, and nuts of the proper rating are available for replacement of those that may be damaged or unserviceable. Replacement flange gaskets of the proper material and rating will also be required.
  - A flange separating tool may be required in order to remove and replace the valve and associated gaskets.
  - Install the new flanged valve, new gaskets, and bolts, washers, and nuts. Tighten all bolts in a sequential fashion to avoid flange misalignment and leakage. Valve manufacturer torque specifications may be required for bolt tightening.
  - Leak test the new flange assemblies using an acceptable liquid leak detection solution at system operating pressure. Retighten flanges, as necessary, until no leaks are present.
- d. Steel Ball/Plug Valve Replacement – Threaded
- Threaded valves should never be installed on a pipeline that is to be buried.
  - Gas pressure should be reduced or eliminated prior to removal and replacement of a valve.
  - Piping support may be required before and after valve removal.
  - Threaded valves require the use of pipe wrenches of sufficient size to facilitate removal and replacement.

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### Valve Corrective Maintenance

- Apply a sufficient amount of thread sealant, thread tape, or a combination of these only to male threaded pipe ends and never to female threads inside the valve body.
  - Tighten the piping and valve threads together only enough to prevent gas leakage.
  - Leak test the new threaded assemblies using an acceptable liquid leak detection solution at system operating pressure. Retighten, as necessary, until no leaks are present.
- e. Steel Ball/Plug Valve Replacement – Welded
- Gas pressure should be reduced or eliminated prior to removal and replacement of a valve.
  - Piping support may be required after excavation of the valve.
  - After acceptance of the welds and appropriate cooling time, leak test the new threaded assemblies using an acceptable liquid leak detection solution at system operating pressure.

### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

### RELATED PROCEDURES

0301 – Manually Opening and Closing Valves, 0331 – Valve – Visual Inspection and Partial Operation  
 0341 – Valve – Preventive Maintenance  
 0801-0811 – Welding & Visual Inspection of Welding and Welds,  
 1241 – Outside Gas Leak Investigation  
 1321-1341 – Damage Prevention & Provide or Assure Adequate Support during Excavation Activities  
 By or On Behalf of the Operator

### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | Reactions to AOC, as appropriate  |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b><br><ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b><br><ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Flow Rate Deviation</b><br><ul style="list-style-type: none"> <li>• No Flow</li> <li>• Unplanned Decrease in Flow</li> <li>• Unplanned Increase in Flow</li> </ul>          | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b><br><ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b><br><ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b><br><ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> </ul>                                   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

Prepared by: SRCS

Approved by: Jeremy Reynolds

Date: 9/22/14

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Valve Corrective Maintenance

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|                                       |  |
|---------------------------------------|--|
| • Misalignment of fittings/components |  |
|---------------------------------------|--|

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| Revision date: 4/14/08 | Version: 2.1 |

### Valve – Visual Inspection & Partial Operation

### Valve – Preventative Maintenance

#### SCOPE AND PURPOSE

This procedure is to ensure that:

- Each Transmission Line valve that may be required during an emergency is inspected and **partially operated**; and
- Each valve that may be used for the safe operation of a Distribution system is checked and serviced, as needed. It describes valve inspection and maintenance practices required to comply with §§192.745 and 192.747.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that valve maintenance is performed at the intervals described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Do not perform valve maintenance if lightning is present.

Upon approaching a valve or valve enclosed in a valve box, check the atmosphere around the valve or valve box for the presence of a gas leak. Repair or schedule for repair any leak detected in accordance with stated procedures.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Leak Detector Equipment
- Valve Key Wrench
- Valve Cleaner (If Needed)
- Valve Lubricant As Specified by Valve Manufacturer (As Needed)
- Valve Sealant (If Needed)
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform valve maintenance. Refer to the OQ Plan for specific qualification requirements.

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**Valve – Visual Inspection & Partial Operation**

**Valve – Preventative Maintenance**

**INSTRUCTIONS**

- a. Obtain records of valve to be inspected along with other documentation needed to record the actions taken on the jobsite.
- b. While approaching each valve, perform a visual examination of the area for signs of conditions that may interfere with proper access to the valve such as:
  - Paving over of valve or valve box
  - Excavation or landscaping activities covering valve or valve box
  - Objects permanently placed over top of valve or valve box
  - Vandalism
- c. If valve is underground, check valve box cover for proper fit, support, and ensure that the proper product designation is stamped on the valve box lid.
- d. If valve or valve box is equipped with a locking device, ensure proper operation – lubricate as needed.
- e. **If Valve is Above-Ground**
  - i. Perform a visual check of the valve to identify:
    - Initial valve position (“Open” or “Closed”).
    - Orientation of the valve in relation to the valve stops, if any.
    - Excess dirt, rust, or foreign materials that may interfere with the operation of the valve.
  - ii. Remove any excess dirt, rust, or foreign materials that may interfere with the operation of the valve.
  - iii. Check the valve for proper alignment to permit the use of a key or wrench.
  - iv. For valves that are to be partially operated (required for Transmission Lines), care shall be taken to ensure that valves that should be “open” are left open and valves that should be “closed” are left closed.
    - Check the valve for proper lubrication.
    - These valves should only be operated to the extent necessary to establish operability of the valve – *Extreme care* should be taken to return these valves to the proper “open” or “closed” position.
  - v. If lubrication is needed, **DO NOT OVER-LUBRICATE** the valve – over-lubrication may force excess grease into the gas stream and cause a stoppage and/or hamper the proper operations of downstream equipment – **ALWAYS Follow Manufacturer’s Guideline for Greasing Valves.**
  - vi. Upon completion of the inspection, verify that the valve is in the proper position.
  - vii. Check the valve for leaks.
- f. **If Valve is Below-Ground**
  - i. Perform a visual check of the valve to identify:
    - Initial valve position (“Open” or “Closed”).
    - Orientation of the valve in relation to the valve stops, if any.
    - Excess dirt, rust, or foreign materials that may interfere with the operation of the valve.

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**Valve – Visual Inspection & Partial Operation**

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**Valve – Preventative Maintenance**

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- ii. Remove any excess dirt, rust, or foreign materials that may interfere with the operation of the valve.
- iii. Verify proper alignment of the valve box over the valve.
  - Verify that a valve wrench or valve key will align through the valve box through to the valve operating nut – If alignment cannot be made, note for scheduled repair or repair immediately.
- iv. For valves that are to be partially operated (required for Transmission Lines), care shall be taken to ensure that valves that should be “open” are left open and valves that should be “closed” are left closed.
  - Check the valve for adequate lubrication.
  - These valves should only be operated to the extent necessary to establish operability of the valve – *Extreme care* should be taken to return these valves to the proper “open” or “closed” position.
- v. If lubrication is needed, *DO NOT OVER-LUBRICATE* the valve – over-lubrication may force excess grease into the gas stream and cause a stoppage and/or hamper the proper operations of downstream equipment – *ALWAYS Follow Manufacturer’s Guideline for Greasing Valves.*
- vi. Upon completion of the inspection, verify that the valve is in the proper position.
- vii. Check the valve for leaks.

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### Valve – Visual Inspection & Partial Operation

### Valve – Preventative Maintenance

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0301 – Manually Opening and Closing Valves

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Flow Rate Deviation</b> <ul style="list-style-type: none"> <li>No Flow</li> <li>Unplanned Decrease in Flow</li> <li>Unplanned Increase in Flow</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization</li> <li>Odor complaint</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>Improper fitting/component installation</li> <li>Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |



# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Spring-Loaded and Pilot-Operated Pressure Regulating, Limiting, and Relief Devices: Inspection, Testing, Preventative and Corrective Maintenance

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#### SCOPE AND PURPOSE

This procedure is to ensure that each pressure limiting/regulating station and relief device (except rupture discs) is inspected/tested as required under §§192.739 & 192.743.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that regulator station inspection and testing is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

If any of these devices is located in a pit, then appropriate confined space entry precautions should be taken.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Hand tools
- Leak detection equipment (soap)
- Manufacturers' manuals, as needed
- Gauges
- Valve wrench
- Nitrogen or inert gas, if used
- Repair kits, as needed
- Other equipment and materials as needed

#### Operator Qualification

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform regulator station inspection and testing. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### Calibration of Instruments

Each instrument used in this procedure shall be calibrated in accordance with the manufacturers' recommended calibration instructions.

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### Spring-Loaded and Pilot-Operated Pressure Regulating, Limiting, and Relief Devices: Inspection, Testing, Preventative and Corrective Maintenance

#### Inspection/Maintenance Steps

- Obtain records of regulator stations to be inspected along with other documentation needed to record the actions taken at the jobsite.
    - These records should contain the necessary information to perform the inspection.
    - Capacity shall be determined by either:
      - Testing the device in place; or
      - Review and calculations except that, after initial calculations, subsequent calculations need not be made if the annual review verifies that parameters have not changed to cause the rated or experimentally determined relieving capacity to be insufficient.
  - Notify appropriate personnel of intent to perform maintenance on a device.
- a. **Visual Inspection**
1. Upon approaching the jobsite, verify that:
    - i. The area is secured –
      - If the station is inside a building or inside a fence, verify that the building or fence gate is locked.
      - If the station is in the open, verify that all valves pertinent to the safe operation of the station are tamper resistant (Bypass valve(s), relief valve isolation valve(s), etc.).
    - ii. Adequate protection exists against accidental damage by vehicular traffic or other similar causes, either by being placed:
      - At a safe distance; or
      - Behind barricades
    - iii. The appropriate signage/line markers is in place, legible, and contains the following information:
      - No Smoking/Danger
      - Line Markers
      - Other information as deemed appropriate
  2. Perform a visual inspection of the regulator station checking for any condition that may prevent proper operation, such as, but not limited to:
    - i. Visible damage
    - ii. Deterioration
    - iii. Atmospheric corrosion
    - iv. Blockage of Vents
- b. **Valve/Valve Operations**
1. Remove locking devices on all valves necessary for the performance of this task (Bypass valves and block valves).
  2. Prior to beginning the inspection, ensure that all valves that will be needed during the inspection are accessible, operating properly, and correctly positioned such as, but not limited to:
    - i. Station inlet, outlet, and bypass valves
    - ii. Relief device isolation valves
    - iii. Control, sensing, and supply line valves
  3. ***Exercise the valve(s) only to the extent necessary to verify proper operation.***

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Pressure Regulating, Limiting, and Relief Devices:  
Inspection, Testing, Preventative and Corrective  
Maintenance

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c. **Regulator Station w/ Relief**

1. Regulator station equipment shall be checked for leaks before and after the inspection – leaks shall be repaired in accordance with company policy.
2. Install pressure gauge(s) as needed to verify and monitor system pressure during the inspection (Note: Steps # 1 & # 2 may be performed in reverse order).
3. Check the operation of the regulator(s)
  - i. Confirm or determine and record current set points.
  - ii. Close the outlet valve to the regulator station – Care shall be taken to monitor the outlet system pressure – Operate bypass valves as needed – See Section e, Maintaining Bypass.
  - iii. Monitor pressure gauge(s) and record the pressure:
    - o Of the set-point of the regulator
    - o At which the regulator achieves lockup, if it is designed to do so
    - Each regulator should be in good working order, control at its set pressure, operate smoothly, and shut off within acceptable limits. If acceptable operation is not obtained during this check, an internal inspection shall be performed.
      - o **(See Section f, Internal Inspection Procedures)**
    - At the operators' discretion, taking into consideration the operating history of the components being inspected, an internal inspection may be performed as a part of this inspection.
      - o **(See Section f, Internal Inspection Procedures)**
4. If the regulator passes inspection, open the outlet valve – **monitor pressure gauge(s) to ensure that regulator assumes control and does not exceed the MAOP.**
5. Check the relief valve set point.
  - i. Install pressure gauge(s) as needed to monitor the pressure at which the relief valve activates.
  - ii. Ensure that the relief valve isolation valve is turned off.
  - iii. Test for the correct relief setting by applying gas pressure to the test connection.
  - iv. Monitor the pressure gauge(s) and record the pressure (set-point) at which the relief valve “opens” and begins relieving.
    - Each relief valve should be in good working order, control at its set pressure, operate smoothly, and shut off within acceptable limits. If acceptable operation is not obtained during this check, an internal inspection shall be performed.
      - o **(See Section f, Internal Inspection Procedures)**
    - At the operators' discretion, taking into consideration the operating history of the components being inspected, an internal inspection may be performed as a part of this inspection.
      - o **(See Section f, Internal Inspection Procedures)**
  - v. Remove the gas from the test connection and verify that the relief valve “closes” and stops relieving.
  - vi. Open relief valve isolation valve

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Spring-Loaded and Pilot-Operated  
Pressure Regulating, Limiting, and Relief Devices:  
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6. Install locking devices as required to prevent unauthorized operation of any stop valve that will make the pressure relief valve or pressure limiting device inoperative by means such as, but not limited to:
  - i. Verifying that the regulator station is inside a fence or building that will limit access to unauthorized personnel; or
  - ii. Installing locking devices on bypass valves, control line valves, and relief valve isolation valve – locking devices may also be installed on the inlet/outlet valves to the regulator station at the operator’s discretion.
7. Determine if additional inspection(s) or maintenance work is required as a result of this inspection.
  - i. This may include internal inspections of regulator(s) and/or relief valve(s) (**See Section f, Internal Inspection Procedures**)
  - ii. This may also include maintenance tasks that require scheduling.
8. Re-Verify that all valves that should be “Open” are open and all valves that should be “Closed” are closed.
9. Re-Verify that all valves that are required to have locking devices are locked to prevent unauthorized access.
10. Ensure that ID tags denoting set-pressure(s) are installed as needed.

**d. Monitor Regulator Station**

1. Ensure pressure gauge(s) are installed and verify that the station is supplying the proper pressure.
2. Verify which regulator is the “primary” regulator and which regulator is the “monitor” regulator.
3. Check the operation of the “primary” regulator.
  - i. Close the outlet valve to the regulator station – Care shall be taken to monitor the outlet system pressure – Operate bypass valves as needed – See Section e, Maintaining Bypass.
  - ii. Monitor pressure gauge(s) and record the pressure at which the “primary” regulator achieves lockup.
    - Each regulator should be in good working order, control at its set pressure, operate smoothly, and shut off within acceptable limits. If acceptable operation is not obtained during this check, an internal inspection shall be performed.
      - (**See Section f, Internal Inspection Procedures**)
    - At the operator’s discretion, taking into consideration the operating history of the components being inspected, an internal inspection may be performed as a part of this inspection
      - (**See Section f, Internal Inspection Procedures**)
4. Check the operation of the “monitor” regulator.
  - i. Adjust the pressure of the primary regulator so that the set-point of the monitor regulator is achieved.
  - ii. Monitor pressure gauge(s) and record the pressure at which the monitor regulator assumes control and achieves lock-up.

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Pressure Regulating, Limiting, and Relief Devices:  
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Maintenance

- Each regulator should be in good working order, control at its set pressure, operate smoothly, and shut off within acceptable limits. If acceptable operation is not obtained during this check, an internal inspection shall be performed.
    - **(See Section f, Internal Inspection Procedures)**
  - At the operators' discretion, taking into consideration the operating history of the components being inspected, an internal inspection may be performed as a part of this inspection.
    - **(See Section f, Internal Inspection Procedures)**
5. Return regulator station to normal operation.
    - i. Adjust the primary regulator to less than set-point.
    - ii. Relieve the pressure between the outlet valve and the regulator.
    - iii. Adjust and set primary regulator to the desired set-point.
    - iv. Open outlet valve of regulator station – **monitor pressure gauge(s) to ensure that regulator assumes control and does not exceed the MAOP.**
  6. Install locking devices as required to prevent unauthorized operation of any stop valve that will make the pressure relief valve or pressure limiting device inoperative by means such as, but not limited to:
    - i. Verifying that the regulator station is inside a fence or building that will limit access to unauthorized personnel; or
    - ii. Installing locking devices on bypass valves, control line valves, and relief valve isolation valve – locking devices may also be installed on the inlet/outlet valves to the regulator station at the operator's discretion.
  7. Determine if additional inspection(s) or maintenance work is required as a result of this inspection.
    - i. This may include internal inspections of regulator(s) **(See Section f, Internal Inspection Procedures)**
    - ii. This may also include maintenance tasks that require scheduling.
  8. Re-Verify that all valves that should be "Open" are open and all valves that should be "Closed" are closed.
  9. Re-Verify that all valves that are required to have locking devices are locked to prevent unauthorized access.
  10. Ensure that ID tags denoting set-pressure(s) are installed as needed.

**e. Maintaining By-Pass**

1. Ensure that section **b, Valve/Valve Operations** of this procedure has been performed.
2. Verify that all necessary gauges are installed to monitor the downstream pressure.
3. Position valve wrenches/keys so that bypass valves are readily accessible.
4. While monitoring downstream pressure, increase/decrease pressure as needed to maintain the desired pressure – **extreme care shall be taken not to exceed the MAOP of the system.**
5. At the conclusion of the bypass operation, slowly close the bypass valve and verify:
  - i. That the regulator takes over pressure control
  - ii. That the regulator is working properly

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**Spring-Loaded and Pilot-Operated  
Pressure Regulating, Limiting, and Relief Devices:  
Inspection, Testing, Preventative and Corrective  
Maintenance**

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6. Install locking devices as required to prevent unauthorized operation of any stop valve that will make the pressure relief valve or pressure limiting device inoperative by means such as, but not limited to:
  - i. Verifying that the regulator station is inside a fence or building that will limit access to unauthorized personnel; or
  - ii. Installing locking devices on by-pass valves, control line valves, and relief valve isolation valve – locking devices may also be installed on the inlet/outlet valves to the regulator station at the operator’s discretion.
7. Re-Verify that all valves that should be “Open” are open and that all valves that should be “Closed” are closed.
8. Re-Verify that all valves that are required to have locking devices are locked to prevent unauthorized access.

**f. Internal Inspection Procedure**

1. **See Section b, Valve/Valve Operations.**
2. Isolate the regulator requiring internal inspection – Care shall be taken to monitor the outlet system pressure – Operate by-pass valves as needed – See Section e, Maintaining Bypass.
3. Safely release gas in the isolated segment into the atmosphere.
4. Perform internal inspection of regulator:
  - i. Check for obstructions, trash, or debris
  - ii. Check for damage to internal components
5. Install new parts as needed.
6. Repair any leaks discovered.
7. Follow manufacturer’s start-up procedure and check for proper operation:
  - i. Regulator shall take control of the flow of gas
  - ii. Regulator shall demonstrate proper lock-up
8. Set the regulator to the correct system pressure.
9. Verify that all leaks have been repaired.
10. Install locking devices as required to prevent unauthorized operation of any stop valve that will make the pressure relief valve or pressure limiting device inoperative by means such as, but not limited to:
  - i. Placing the regulator station inside a fence or building that will limit access to unauthorized personnel; or
  - ii. Installing locking devices on by-pass valves, control line valves, and relief valve isolation valve – locking devices may also be installed on the inlet-outlet valves to the regulator station at the operator’s discretion.
11. Ensure that ID tags denoting set-pressure(s) are installed as needed

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Spring-Loaded and Pilot-Operated Pressure Regulating, Limiting, and Relief Devices: Inspection, Testing, Preventative and Corrective Maintenance

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

0591 – Leak Test at Operating Pressure

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate   |  |
|---|--|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>Protect life &amp; Property</li> <li>Prevent accidental ignition</li> <li>Notify appropriate personnel</li> <li>Notify Fire/Emergency Responders</li> <li>Initiate Emergency Plan</li> </ul>            | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Use appropriate PPE</li> <li>Stop gas flow</li> <li>Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>Protect life &amp; Property</li> <li>Prevent accidental ignition</li> <li>Notify appropriate personnel</li> <li>Notify Fire/Emergency Responders</li> <li>Initiate Emergency Plan</li> </ul>            | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Use appropriate PPE</li> <li>Stop gas flow</li> <li>Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Pressure Deviation</b> <ul style="list-style-type: none"> <li>No Pressure</li> <li>Unplanned Decrease in Pressure</li> <li>Unplanned Increase in Pressure</li> </ul>   | <ul style="list-style-type: none"> <li>Protect life &amp; property</li> <li>Notify appropriate personnel</li> <li>Initiate Emergency Plan as Needed</li> </ul>   | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Make repairs/eliminate AOC</li> </ul>   |
| <b>Activation of a Safety Device(s) other than planned testing</b> <ul style="list-style-type: none"> <li>Emergency Shutdown</li> <li>High Pressure Shutdown</li> <li>High Temp. Shutdown</li> <li>Pressure Relief Valve Relieving</li> </ul> | <ul style="list-style-type: none"> <li>Protect life &amp; Property</li> <li>Prevent accidental ignition</li> <li>Notify appropriate personnel</li> <li>Notify Fire/Emergency Responders</li> <li>Initiate Emergency Plan, as needed</li> </ul> | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Electric Shock</li> </ul>   | <ul style="list-style-type: none"> <li>Protect life &amp; property</li> <li>Notify appropriate personnel</li> <li>Initiate Emergency Plan as Needed</li> </ul>   | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization</li> <li>Odor complaint</li> </ul>  | <ul style="list-style-type: none"> <li>Protect life &amp; property</li> <li>Prevent accidental ignition</li> <li>Notify appropriate personnel</li> </ul>   | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>Improper fitting/component installation</li> <li>Misalignment of fittings/components</li> </ul>  | <ul style="list-style-type: none"> <li>Protect life &amp; property</li> <li>Prevent accidental ignition</li> </ul>   | <ul style="list-style-type: none"> <li>Notify appropriate personnel</li> <li>Make repairs/eliminate AOC</li> </ul>   |

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### Pressure Test – Nonliquid Medium – MAOP Less Than 100 psi

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#### SCOPE AND PURPOSE

This procedure is to ensure adequate pressure testing of pipeline systems operating below 100 psig and to ensure discovery of all potentially hazardous leaks in the segment being tested as required under §192.509. Other related Code sections include §§192.511, 192.513, & 192.725.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that pressure testing is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Test Device/Gauges/Recording Instruments
- Test Medium (Nitrogen, Air, etc)
- Leak Detection Equipment (Soap, CGI etc)
- Fittings
- Other Equipment as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform pressure testing for pipelines operating below 100 psig. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Pressure Testing Steps

- a. Verify the following information prior to beginning the pressure test:
  - i. Maximum Allowable Operating Pressure (MAOP) of the segment to be pressure tested.
  - ii. Maximum Operating Pressure (MOP) of the segment to be pressure tested.
  - iii. The minimum and maximum test pressure for the segment to be pressure tested (see section f., items i-iv.).
  - iv. The test duration of the segment to be pressure tested (See O&M Manual).
  - v. The test medium to be used for the pressure test.
- b. Ensure that pressure gauges/recording instruments have been calibrated in accordance with company procedures and manufacturers' specifications.
- c. Ensure that segment to be pressure tested is:
  - i. Isolated from any customer piping to prevent the pressure test from being introduced into customer piping.
  - ii. Isolated from the source of gas (to prevent the pressure test from being introduced into the gas stream).



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### Pressure Test – Nonliquid Medium – MAOP Less Than 100 psi

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- d. Ensure that the pipe end receiving the test gauge is cleaned prior to the installation of the test gauge.
- e. Install test gauge on the isolated segment to be pressure tested.
- f. Using the test medium (Air, Nitrogen), pressurize the isolated segment according to the following:
  - i. For steel mains operating at a pressure greater than 1 psig:
    - o 1.5 times the MAOP, or 90 psig minimum.
  - ii. For steel service lines operating at a pressure between 1 psig and 40 psig:
    - o A minimum of 50 psig.
  - iii. For steel service lines operating at a pressure greater than 40 psig:
    - o 1.5 times the MAOP or 90 psig minimum.
  - iv. For plastic pipelines:
    - o 1.5 times the (MAOP) or 50 psig, whichever is greater; however,
    - o The maximum test pressure may not be more than three times the design pressure at a temperature not less than the pipe temperature during the test.
    - o During the test, the temperature of the plastic pipe may not be more than 100°F.
- g. Record the initial time of the pressure test.
- h. Soap-test the test-gauge and related fittings.
- i. Maintain and observe the test pressure for the required test duration (see O&M Manual).
  - i. Investigate and repair all leaks discovered during the pressure test.
  - ii. Apply a new pressure test once leaks have been repaired.
- j. If the pressure test reveals that the isolated segment being pressure tested is free of leakage, slowly relieve the pressure from the isolated segment.
- k. Remove testing device, gauges, and other related fittings.
- l. Connect the isolated section to the source of gas.
- m. Test the final connection(s) for leaks using a soap-test or other leak detection equipment.
- n. Purge the air from the previously isolated segment.
- o. Document the work performed as outlined in Reporting/Notification below.

#### REPORTING/NOTIFICATION

The following minimum information shall be recorded and kept of each test required by §192.517:

- The operator's name, the name of the employee responsible for making the test, and/or the name of any test company used.
- The test medium used (i.e. Air, Nitrogen).
- The test pressure.
- The test duration.
- The test date.
- Pressure recording charts or other record of pressure readings.
- Elevation variations, whenever significant for the particular test.
- Leaks and failures noted and their disposition.

#### RELATED PROCEDURES

0591 – Leak Test at Operating Pressure

0641 – Visually Inspect Pipe and Components Prior to Installation

|                   |                              |               |
|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Pressure Test – Nonliquid Medium – MAOP Less Than 100 psi

#### ABNORMAL OPERTING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| <b>B31Q Task #0571</b>  | Page 1 of 3  |
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### Pressure Test – Nonliquid Medium – MAOP Greater Than or Equal to 100 psi

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#### SCOPE AND PURPOSE

This procedure is to ensure adequate pressure testing of pipeline systems operating at or above 100 psig and to ensure discovery of all potentially hazardous leaks in the segment being tested as required under §192.507. Other related code sections include §§192.511, 192.513, & 192.725.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that pressure testing is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Test Device/Gauges/Recording Instruments
- Test Medium (Nitrogen, Air, etc)
- Leak Detection Equipment (Soap, CGI etc)
- Fittings
- Other Equipment as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform pressure testing for pipelines operating at or above 100 psig. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Pressure Testing Steps

- a. Verify the following information prior to beginning the pressure test:
  - i. Maximum Allowable Operating Pressure (MAOP) of the segment to be pressure tested.
  - ii. Maximum Operating Pressure (MOP) of the segment to be pressure tested.
  - iii. The minimum and maximum test pressure for the segment to be pressure tested (see section f., items i-iv.).
  - iv. The test duration of the segment to be pressure tested (see O&M Manual).
  - v. The test medium to be used for the pressure test.
- b. Ensure that pressure gauges/recording instruments have been calibrated in accordance with company procedures and manufacturers' specifications.
- c. Ensure that segment to be pressure tested is:
  - i. Isolated from any customer piping to prevent the pressure test from being introduced into customer piping.
  - ii. Isolated from the source of gas (to prevent the pressure test from being introduced into the gas stream).

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### Pressure Test – Nonliquid Medium – MAOP Greater Than or Equal to 100 psi

- d. Ensure that the pipe end receiving the test gauge is cleaned prior to the installation of the test gauge.
- e. Install test gauge on the isolated segment to be pressure tested.
- f. Using the test medium (Air, Nitrogen), pressurize the isolated segment according to the following:
  - i. For steel mains and services operating at a pressure greater than or equal to 100 psig:
    - o 1.5 times the MAOP or the maximum operating pressure multiplied by the class location factor in §192.619(a)(2)(ii).
  - ii. For plastic pipelines:
    - o 1.5 times the MAOP or 50 psig, whichever is greater; however,
    - o The maximum test pressure may not be more than three times the design pressure at a temperature not less than the pipe temperature during the test.
    - o During the test, the temperature of the plastic pipe may not be more than 100°F.
- g. Record the initial time of the pressure test.
- h. Soap-test the test-gauge and related fittings.
- i. Maintain and observe the test pressure for the required test duration (see O&M Manual).
  - i. Investigate and repair all leaks discovered during the pressure test.
  - ii. Apply a new pressure test once leaks have been repaired.
- j. If the pressure test reveals that the isolated segment being pressure tested is free of leakage, slowly relieve the pressure from the isolated segment.
- k. Remove testing device, gauges, and other related fittings.
- l. Connect the isolated section to the source of gas.
- m. Test the final connection(s) for leaks using a soap-test or other leak detection equipment.
- n. Purge the test medium from the previously isolated segment (Task #1641-1651).
- o. Document the work performed as outlined in Reporting/Notification below.

#### REPORTING/NOTIFICATION

The following minimum information shall be recorded and kept of each test required by §192.517:

- The operator's name, the name of the employee responsible for making the test, and/or the name of any test company used.
- The test medium used (i.e. Air, Nitrogen).
- The test pressure.
- The test duration.
- The test date.
- Pressure recording charts or other record of pressure readings.
- Elevation variations, whenever significant for the particular test.
- Leaks and failures noted and their disposition.

#### RELATED PROCEDURES

0591 – Leak Test at Operating Pressure

|                   |                              |               |
|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
|-------------------|------------------------------|---------------|

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Pressure Test – Nonliquid Medium – MAOP Greater Than or Equal to 100 psi

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Pressure Test – Liquid Medium

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to perform pressure testing of pipeline utilizing a liquid medium such as water. It ensures the discovery of all potentially hazardous leaks in the segment being tested. It describes leak test and strength test requirements under §§192.503 and 192.505.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that hydrostatic testing is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Test Device/Gauges/Recording Instruments
- Test Medium (Water)
- Fittings
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### General

Hydrostatic pressure testing requires the pipeline to be completely filled with a liquid such as water and pressurized to a level higher than the maximum allowable operating pressure. This test pressure is maintained for a specified period of time to confirm the integrity of the pipeline.

##### Preparation for Test

- a. Verify the following prior to beginning the pressure test:
  - i. Maximum Allowable Operating Pressure (MAOP).
  - ii. Maximum Operating Pressure (MOP).
  - iii. Minimum and maximum test pressure.
  - iv. Class location
  - v. The duration of test
  - vi. Liquid test medium (water) source
  - vii. Disposal method for test medium (water)

|                         |              |
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**Pressure Test – Liquid Medium**

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- b. Ensure that pressure gauges/recording instruments have been calibrated in accordance with company procedures and manufacturer's specifications.

**Steps**

- a. Isolate pipeline segment from source of gas and any customer piping by use of weld caps, blind flanges or other appropriate devices. Testing against closed valves should be avoided.
- b. Install test gauge/chart on the isolated segment of pipeline to be pressure tested.
- c. Insert specialty spheres or squeegees (pigs) into the pipeline segment then completely fill with water. Entrapped air is eliminated as the water pushes the pig(s) through the pipeline.
- d. Pressurize pipeline by the use of compressors or pumps. Caution should be used so that over-pressurization does not occur. Maintain and observe the test pressure for the required test duration. Whenever testing long segments and/or large diameter pipe, the duration of the test should be long enough to be certain that the temperature of water has stabilized. Backfill prior to hydrostatic testing; this helps to stabilize the temperature of the liquid medium (water).
  - i. If the pressure stays constant, the test is considered successful.
  - ii. Leaks are indicated by a drop in pressure. Any indication of leakage requires remedial action. The pipeline segment is then re-pressurized and the test is repeated.
  - iii. Whenever there is a significant change in elevation, the pressure in the pipeline segment will be equal to the indicated gage pressure plus or minus elevation change depending upon gage location. Compensate as necessary.
- e. Once the hydrostatic test is successfully completed, the test water is discharged from the pipeline by compressed air. The air compressors used for emptying the water from the pipeline segment should have ample capacity in both volume and pressure to allow the pigs to travel through the pipe. Continue pig runs until the pipeline segment is as dry as practically possible. When necessary, implement any erosion prevention practices for the removal and discharge of the water.

**REPORTING/NOTIFICATION**

Complete documentation in accordance with Operation and Maintenance Manual

**RELATED PROCEDURES**

0591-Leak Test at Operating Pressure

|                         |              |
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### Pressure Test – Liquid Medium

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |



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|-------------------------|--------------|
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### Leak Test at Operating Pressure

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#### SCOPE AND PURPOSE

This procedure is to ensure adequate leak testing at operating pressure and to ensure discovery of all potentially hazardous leaks in the segment being tested as required under §192.503. Other related code sections include §§192.511, 192.513, & 192.725.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that pressure testing is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Leak Detection Equipment (Soap solution, CGI, etc)
- Other Equipment as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform leak testing at operating pressure. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Pressure Testing Steps

- Typically, the final joint/fitting that is used to tie in a segment of pipeline is not subjected to a pressure test. Therefore, each joint that is used to tie in a segment of pipeline shall be leak tested at not less than its operating pressure.
- Once the operating pressure has been introduced to the pipeline segment and the pressure has stabilized, leak test the final joint/fitting using either:
  - A soap solution – The soap solution is typically brushed or sprayed on the joint/fitting; visually inspect the joint/fitting to check for signs of leakage (bubbling of the soap solution on the joint/fitting indicates leakage).
  - CGI or other gas detector capable of detecting leakage – Using the instrument, obtain samples of the air around the joint/fitting to check for signs of leakage (a reading on the instrument indicates leakage).
- Repair any leaks discovered in accordance with company policy.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Leak Test at Operating Pressure

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

0381-0391-0411-0421 – Spring-Loaded and Pilot-Operated Pressure Regulating, Limiting, and Relief Devices: Inspection, Testing, Preventative and Corrective Maintenance

0561 – Pressure Test – Non-Liquid Medium – Test Pressure below 100 psig

0571 – Pressure Test – Non-Liquid Medium – Test at or Above 100 psig

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 10/22/08 | Version: 2.0 |

### NDT – Radiographic Testing

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to ensure that through-the-wall inspection using radiography and the evaluation of test results are performed in accordance with American Society of Nondestructive Testing (ASNT) standards. It describes practices required to comply with §192.243(a).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that radiographic testing is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Radiography Equipment
- Hand Tools
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### General

This activity will be performed by personnel having Level II qualification in accordance with ASNT SNT-TC-1A standards.

##### Steps

[City of Thomasville](#) will obtain and adopt procedures for this Task prior to the performance of the Task.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

None

|                   |                              |               |
|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
|-------------------|------------------------------|---------------|

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

|                         |              |
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| <b>B31Q Task #0601</b>  | Page 2 of 2  |
| Revision date: 10/22/08 | Version: 2.0 |

### NDT – Radiographic Testing

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| B31Q Task #0611         | Page 1 of 2  |
| Revision date: 10/22/08 | Version: 2.0 |

### NDT – Liquid Penetrant Testing

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to ensure that surface examination using liquid (dye) penetrant and the evaluation of test results are performed in accordance with American Society of Nondestructive Testing (ASNT) standards. It describes practices required to comply with §192.243(a).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that liquid penetrant testing is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Liquid Penetrant Materials and Equipment
- Hand Tools
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### General

This activity will be performed by personnel having Level II qualification in accordance with ASNT SNT-TC-1A standards.

##### Steps

[City of Thomasville](#) will obtain and adopt procedures for this Task prior to the performance of the Task.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

None

|                   |                              |               |
|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
|-------------------|------------------------------|---------------|

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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| <b>B31Q Task #0611</b>  | Page 2 of 2  |
| Revision date: 10/22/08 | Version: 2.0 |

### NDT – Liquid Penetrant Testing

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| B31Q Task #0621         | Page 1 of 2  |
| Revision date: 10/22/08 | Version: 2.0 |

### NDT – Magnetic Particle Testing

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to ensure that surface examination using magnetic particle and the evaluation of test results are performed in accordance with American Society of Nondestructive Testing (ASNT) standards. It describes practices required to comply with §192.243(a).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that magnetic particle testing is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Magnetic Particle Equipment
- Hand Tools
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### General

This activity will be performed by personnel having Level II qualification in accordance with ASNT SNT-TC-1A standards.

##### Steps

[City of Thomasville](#) will obtain and adopt procedures for this Task prior to the performance of the Task.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

None

|                   |                              |               |
|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
|-------------------|------------------------------|---------------|

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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| <b>B31Q Task #0621</b>  | Page 2 of 2  |
| Revision date: 10/22/08 | Version: 2.0 |

### NDT – Magnetic Particle Testing

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |



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| B31Q Task #0631         | Page 1 of 2  |
| Revision date: 10/22/08 | Version: 2.0 |

### NDT – Ultrasonic Testing

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to ensure that through-the-wall inspection using ultrasonics and the evaluation of test results are performed in accordance with American Society of Nondestructive Testing (ASNT) standards. It describes practices required to comply with §192.243(a).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that ultrasonic testing is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Ultrasonic Equipment
- Hand Tools
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### General

This activity will be performed by personnel having Level II qualification in accordance with ASNT SNT-TC-1A standards.

##### Steps

[City of Thomasville](#) will obtain and adopt procedures for this Task prior to the performance of the Task.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

None

|                   |                              |               |
|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
|-------------------|------------------------------|---------------|

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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| <b>B31Q Task #0631</b>  | Page 2 of 2  |
| Revision date: 10/22/08 | Version: 2.0 |

### NDT – Ultrasonic Testing

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| <b>B31Q Task #0681</b>  | Page 1 of 2  |
| Revision Date: 08/26/08 | Version: 2.0 |

### Joining of Plastic Pipe – Stab Fittings

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#### SCOPE AND PURPOSE

This procedure includes the joining and inspection of plastic pipe with stab fittings and inspection of completed joints. It describes the practices required by §§192.273(b)(c), 192.281(e), 192.283(c), 192.285, & 192.287.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the joining of plastic pipe using stab fittings is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Stab fitting
- Chamfer tool
- Pipe/tubing cutter
- Soft felt-tip pen, crayon, or other markers
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

The installation of stab fittings shall be performed in accordance with the manufacturer's instructions.

##### Installation Steps

- a. Verify that the fitting selected is the correct size and SDR
  - SDR (Standard Dimension Ratio) is the ratio of pipe diameter to wall thickness
    - Ex: Pipe size =  $\frac{3}{4}$  IPS (iron pipe size), SDR = 11
    - The size and SDR should match both the pipe and the fitting
- b. Prepare the pipe
  - Cut the pipe end(s), ensuring that the pipe end(s) is square
  - Clean the pipe where fitting will be installed.
  - Inspect the plastic pipe for damage; cut out any damage found
- c. If the stab fitting requires the use of a chamfering tool, chamfer the pipe in accordance with the manufacturer's instructions.
- d. Mark the stab depth in accordance with the manufacturer's instructions.
- e. Stab the plastic piping completely into the fitting until the plastic piping "bottoms out" in the fitting

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| <b>B31Q Task #0681</b>  | Page 2 of 2  |
| Revision Date: 08/26/08 | Version: 2.0 |

### Joining of Plastic Pipe – Stab Fittings

- The stab depth mark should be visible, generally within 1/8" from the entrance of the fitting (this distance may vary by fitting manufacturer)

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0561 – Pressure Test – Non-liquid Medium – MAOP less than 100 psi

0591 – Leak Test at Operating Pressure

0641 – Visually Inspect Pipe and Components Prior to Installation

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Static Electricity</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization</li> <li>Odor complaint</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| B31Q Task #0691-0701    | Page 1 of 3  |
| Revision Date: 08/26/08 | Version: 2.0 |

### Joining of Pipe – Non-Bottom Out & Bottom Out Compression Couplings

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#### SCOPE AND PURPOSE

This procedure includes the joining and inspection of pipe 2-inch and less with bottom out & non-bottom out compression couplings and inspection of completed joints. It describes the practices required by §192.273(b)(c).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the joining of pipe using bottom out & non-bottom out compression couplings is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger  
Ensure that all applicable safety equipment is being utilized as per company policy

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Couplings/stiffeners as needed
- Wrenches
- Pipe/tubing cutter
- Soft felt-tip pen, crayon, or other marker
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

- The installation of bottom out & non-bottom out compression couplings shall be performed in accordance with the manufacturer's instructions.
- Verify that the coupling selected is the correct coupling for the application (correct size, type, etc.).

##### Non-Bottom Out Compression Coupling

*Non-bottom out compression coupling is one that requires tightening to a specified torque or number of turns*

- a. Prepare the pipe
  - Cut the pipe end(s), ensuring that the pipe end(s) is square (within coupling manufacturer's tolerances)
  - Inspect the pipe for damage; cut out any damage found
  - Clean the pipe surface in the area of the coupling installation
  - Complete the pipe preparation in accordance with the coupling manufacturer's instructions

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| B31Q Task #0691-0701    | Page 2 of 3  |
| Revision Date: 08/26/08 | Version: 2.0 |

### Joining of Pipe – Non-Bottom Out & Bottom Out Compression Couplings

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- b. Using an appropriate type marker, mark the insertion depth in accordance with the manufacturer's instructions.
- c. Assemble the coupling on the pipe following the coupling manufacturer's instructions.
- d. Tighten the coupling to the specified torque as per the manufacturer's instructions.

#### Bottom Out Compression Coupling

*Bottom out compression coupling is one that is designed to prevent over tightening by contact (bottoming out) of the nut with a square shoulder or mating face*

- a. Prepare the pipe
  - Cut the pipe end(s), ensuring that the pipe end(s) is square (within coupling manufacturer's tolerances)
  - Inspect the pipe for damage; cut out any damage found
  - Clean the pipe surface in the area of the coupling installation
  - Complete the pipe preparation in accordance with the coupling manufacturer's instructions
- b. Using an appropriate type marker, mark the insertion depth in accordance with the manufacturer's instructions.
- c. Assemble the coupling on the pipe following the coupling manufacturer's installation instructions.
- d. Tighten the coupling until the tightening nut contacts the square shoulder or mating face as per the manufacturer's instructions.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

|                   |                              |               |
|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
|-------------------|------------------------------|---------------|

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

|                             |              |
|-----------------------------|--------------|
| <b>B31Q Task #0691-0701</b> | Page 3 of 3  |
| Revision Date: 08/26/08     | Version: 2.0 |

### Joining of Pipe – Non-Bottom Out & Bottom Out Compression Couplings

#### RELATED PROCEDURES

- 0561 – Pressure Test – Non-liquid Medium – MAOP less than 100 psi
- 0571 – Pressure Test – Non-liquid Medium – MAOP greater than or equal to 100 psi
- 0591 – Leak Test at Operating Pressure
- 0641 – Visually Inspect Pipe and Components Prior to Installation
- 0711 – Joining of Pipe – Compression Couplings

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

|                         |              |
|-------------------------|--------------|
| B31Q Task #0711         | Page 1 of 2  |
| Revision Date: 08/26/08 | Version: 2.0 |

### Joining of Pipe – Compression Couplings

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#### SCOPE AND PURPOSE

This procedure includes the joining and inspection of pipe greater than 2-inch with compression couplings and inspection of completed joints. It describes the practices required by §192.273(b) & (c).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the joining of pipe using compression couplings is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Couplings/stiffeners as needed
- Wrenches
- Pipe/tubing cutter
- Soft felt-tip pen, crayon, or other markers
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

- The installation of compression couplings shall be performed in accordance with the manufacturer's instructions.
- Verify that the coupling selected is the correct coupling for the application (correct size, type, etc.).

##### Installation

- a. Prepare the pipe
  - Cut the pipe end(s), ensuring that the pipe end(s) is square (within coupling manufacturer's tolerances)
  - Inspect the pipe for damage; cut out any damage found
  - Clean the pipe surface in the area of the coupling installation
  - Complete the pipe preparation in accordance with the coupling manufacturer's instructions
- b. Using an appropriate type marker, mark the insertion depth in accordance with the manufacturer's instructions.
- c. Assemble the coupling on the pipe following the coupling manufacturer's instructions.
- d. Tighten the coupling to the specified torque, hydraulic pressure, etc. as per the manufacturer's instructions.



# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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| <b>B31Q Task #0711</b>  | Page 2 of 2  |
| Revision Date: 08/26/08 | Version: 2.0 |

### Joining of Pipe – Compression Couplings

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

- 0561 – Pressure Test – Non-liquid Medium – MAOP less than 100 psi
- 0571 – Pressure Test – Non-liquid Medium – MAOP greater than or equal to 100 psi
- 0641 – Visually Inspect Pipe and Components Prior to Installation
- 0591 – Leak Test at Operating Pressure
- 0691 – 0701 – Joining of Pipe – Bottom Out & Non-Bottom Out Compression Couplings

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| B31Q Task #0721         | Page 1 of 2  |
| Revision Date: 08/26/08 | Version: 2.0 |

### Joining of Pipe – Threaded Joints

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#### SCOPE AND PURPOSE

This procedure includes the joining and inspection of threaded pipe with threaded fittings, and the inspection of completed joints. It describes the practices required by §192.273.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the joining of pipe using threaded fittings is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Threaded fittings
- Wrenches
- Pipe/thread sealant
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

Verify that the fitting selected is the correct fitting for the application (correct size, type, etc.).

##### Installation

- Inspect pipe, fitting, and pipe/fitting threads for
  - Damage
  - Deformities
  - Defects
  - Any other condition that may impair a gas tight connection
- Remove/replace any fitting or section of pipe found to have any condition mentioned above.
- Clean the threaded surfaces to remove any surface rust, dirt, etc.
- Apply pipe thread sealant in accordance with the pipe thread sealant manufacturer's instructions.
- Assemble the joint and tighten using the appropriate wrenches
  - Note: Unless the pipe/fitting is being installed with the use of a pipe vise or other acceptable method, it is recommended that two wrenches be used to tighten the fitting to the pipe
    - One wrench is used to hold the pipe to help prevent other fittings from being loosened while the other wrench is used to tighten the fitting to the pipe
- Inspect the completed joint for

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### Joining of Pipe – Threaded Joints

- Damage
- Deformities
- Defects
- Any other condition that may impair a gas tight connection

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

0561 – Pressure Test – Non-liquid Medium – MAOP less than 100 psi

0571 – Pressure Test – Non-liquid Medium – MAOP greater than or equal to 100 psi

0591 – Leak Test at Operating Pressure

0641 – Visually Inspect Pipe and Components Prior to Installation

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| B31Q Task #0731         | Page 1 of 3  |
| Revision Date: 08/26/08 | Version: 2.0 |

### Joining of Pipe – Flange Assembly

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#### SCOPE AND PURPOSE

This procedure includes the assembly of flanges, bolting in sequence and torquing, as specified. It describes the practices required by §192.273.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the joining of pipe using flange assemblies is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Flanges
- Flange bolts & nuts
- Washers, as needed
- Flange gaskets, as needed
- Wrenches
- Torque wrench, as needed
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

Verify that the flange selected is the correct flange for the application (correct size, ANSI Class etc.), and all necessary and appropriate bolts, nuts, and gaskets are installed.

##### Flange Assembly

- a. Clean the sealing surfaces of the flanges and verify that they are clean and smooth.
- b. The sealing faces of the flanges should be installed parallel to each other.
- c. Ensure that the flanges are aligned so that all flange bolts will fit through the flange bolt-holes.
- d. Using the appropriate gasket, if required, install the gasket between the two flanges
  - It may be necessary to install a couple of flange bolts in the bottom bolt-holes of the flanges to keep the gasket from dropping out of the bottom of the flange
- e. Verify that the gasket is installed against the sealing surfaces of the flanges.

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### Joining of Pipe – Flange Assembly

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#### Bolting Methods/Torque Values

- a. Methods for tightening flange bolts may include the use of torque wrenches.
- b. The proper bolt torque values are based on
  - gasket material
  - flange size
  - flange type
  - flange rating
  - bolt size
  - bolt material
  - washer material
  - thread lubricantWhen available, the gasket manufacturer's recommended torque values should be followed
- e. Flange bolts should be lubricated prior to installation by
  - Using pre-coated bolts
  - By field application of thread lubricants

#### Example

1. Bolt torque should be applied evenly across the flange. Always follow the gasket manufacturer's recommendations for tightening of flanges with nut and bolt
  - a. Using a "star" or "crisscross" pattern,
    - i. Install and hand tighten all bolts and nuts – to include any insulating kits as needed
    - ii. Using a wrench:
      - tighten all bolts and nuts to approximately 30% of final torque
      - Tighten all bolts and nuts to approximately 60% of final torque
      - Tighten all bolts and nuts to 100% of final torque
  - b. Final tightening process:
    - Follow a circular pattern and ensure that all bolts are tightened to 100% of final torque
2. Visually inspect completed joint, checking for signs of
  - Damage
  - Deformities
  - Defects
  - Any other condition that may impair a gas tight connection

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

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|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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| <b>B31Q Task #0731</b>  | Page 3 of 3  |
| Revision Date: 08/26/08 | Version: 2.0 |

### Joining of Pipe – Flange Assembly

#### RELATED PROCEDURES

- 0561 – Pressure Test – Non-liquid Medium – MAOP less than 100 psi
- 0571 – Pressure Test – Non-liquid Medium – MAOP greater than or equal to 100 psi
- 0591 – Leak Test at Operating Pressure
- 0641 – Visually Inspect Pipe and Components Prior to Installation

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| B31Q Task #0751-0761    | Page 1 of 4  |
| Revision date: 08/26/08 | Version: 2.0 |

### Joining of Plastic Pipe – Butt Heat Fusion: Manual and Hydraulic Machine

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to produce strong gastight joints utilizing butt heat fusion techniques. It describes practices required to comply with §192.281(a) and (c)(1)-(c)(4).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that joining plastic pipe by butt heat fusion is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.  
Avoid using fusion machine in a combustible gas atmosphere.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Butt Fusion Machine  
Facing Unit  
Heating Tool
- Electrical Power Source
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### General

- Manufacturers may have a similar but slightly different approach regarding plastic pipe heat fusion; however, pipe melt patterns must be joined with a specified amount of force and maintained in a immobile position until adequately cooled as described in the manufacturer's instruction manual. Personnel performing butt heat fusion production joints shall follow each respective joining procedure.
- Coated butt fusion heater plates should be attached to heating tool. The heater plate surfaces are coated with an anti-stick coating and must be clean and free of any contamination.
- When cross fusing (joining medium density to high density pipe), use a compatibility insulator "heat shield". Place the compatibility insulator against the medium density pipe. Remove the compatibility insulator once 50% of the normal melt pattern has been reached. This helps ensure that both pipe ends will melt equally.

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| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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| B31Q Task #0751-0761    | Page 2 of 4  |
| Revision date: 08/26/08 | Version: 2.0 |

### Joining of Plastic Pipe – Butt Heat Fusion: Manual and Hydraulic Machine

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#### Manual Steps

- a. Plug heating tool in a proper power source and place into an insulated heater stand. Allow the heater to warm-up and reach operating temperature.
- b. Install proper inserts into the clamps of fusion machine for the pipe size to be fused.
- c. Position pipe into fusion machine by opening the upper section of clamps and insert pipe. The pipe ends should extend slightly beyond the clamps.
- d. Close upper section of clamps and rotate clamp knobs until pipe is securely tighten in place. This will prevent pipe slippage when facing and joining.
- e. Thoroughly clean pipe ends removing dirt and other debris.
- f. Place facing unit between the pipe ends onto guide rods and lock into position. Use the lever handle to bring pipe ends together against the facer. Turn facer handle counter clockwise while applying firm pressure on the lever handle. Continue operating facer until facer stops have bottomed out against the clamps.
- g. Remove facer by unlatching from guide rod.
- h. Remove shavings being careful not to touch the newly faced pipe ends. Body oils can contaminate pipe ends causing inadequate fusion.
- i. Bring pipe ends together again and check for proper alignment. If necessary, adjust high side down by tightening clamp. Once pipe is properly aligned, use the lever handle to separate pipe.
- j. Once heating tool has reached acceptable surface temperature, position between pipe ends. Use the lever handle to bring pipe ends against heater surface making full contact Hold pipe ends in contact with the heater until melt swell beads have reached the proper size.
- k. Use the lever handle to separate pipe ends and remove the heating tool being careful not to displace melt.
- l. Quickly bring pipe ends together using enough pressure to roll the melt swell beads over the pipe surface creating a double bead. **DO NOT SLAM ENDS TOGETHER.** Hold this pressure for the acceptable cooling time. Refer to manufacturer's manual for melt swell bead width guidelines, cooling time and proper appearance of double bead.
- m. Once the pipe has sufficiently cooled, remove from fusion machine.
  - \* Visually examine the joint for compliance.

#### Hydraulic Machine Steps

- a. Make sure the hydraulic power unit is in the off position.
- b. Connect hydraulic hoses from the hydraulic power unit to the facer and carriage.
- c. Perform general maintenance check ensuring:
  - \* Proper oil level
  - \* Hoses and electrical cords are in good condition
  - \* Correct input voltage to fusion machine
- d. Connect fusion machine to proper power source and turn on hydraulic pump motor.
  - \* Note gauge pressure and if necessary, set system pressure according to manufacturer's recommendations for pipe size & SDR.
- e. Prepare heater by attaching butt fusion heater adapters to the heater tool. Place heater into a insulated heater stand and connect to proper power source. Allow heater to warm up and reach operating temperature.
- f. Install proper inserts into pipe clamps for the pipe size to be fused.



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**Joining of Plastic Pipe – Butt Heat Fusion:  
Manual and Hydraulic Machine**

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- g. Position pipe into fusion machine. The pipe ends should extend slightly beyond the clamps. Ensure sufficient material will be removed for a complete facing.
- h. Close clamps and rotate clamp knobs until pipe is securely tighten in place.
- i. Thoroughly clean pipe ends removing dirt and other debris.
- j. Place facing unit between the pipe ends onto the guide rods and lock into position.
- k. Assure the selector valve handle is in the facing position. Move the carriage toward the fixed clamps. Face pipe ends producing continuous shavings. Continue operating facer until facer stops have bottomed out against the clamps.
- l. Once facing is completed, turn off facing unit, separate pipe ends and remove facer by unlatching from guide rods.
- m. Remove shavings being careful not to touch the newly faced pipe ends.
  - \* Inspect pipe ends for complete facing.
- n. Move the carriage to bring the pipe ends together again and check for proper alignment. If necessary, adjust high side down by tightening clamp. Once the pipe is properly aligned, move the carriage to separate pipe.
- o. Once heating tool has reached acceptable surface temperature, position between pipe ends. Shift the selector valve handle in the fusing position. Move the carriage bringing the heater and pipe ends together. Once the pipe ends are firmly against the heater, if applicable, immediately move the selector valve to the neutral position. This will remove any unnecessary pressure. If too much pressure of the pipe against the heater is maintained during the heating period, melt will be squeezed away from the pipe ends. This could cause a weakened joint after fusing. Heat the pipe ends until melt swell beads have reached the proper size.
- p. Shift the selector valve handle to the fusion position. Move the carriage just enough to remove the heater then quickly move the carriage again bringing the pipe ends together. The force applied will cause the melt swell beads to roll back onto the pipe creating a double bead. Allow the joint to cool under pressure according to the pipe manufacturer's guidelines.
- q. Once the pipe has sufficiently cooled, shift the carriage control valve to the neutral position and remove fused pipe from fusion machine.
  - \* Visually examine the joint for compliance.

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| B31Q Task #0751-0761    | Page 4 of 4  |
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### Joining of Plastic Pipe – Butt Heat Fusion: Manual and Hydraulic Machine

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization</li> <li>Odor complaint</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>Improper fitting/component installation</li> <li>Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 08/13/09 | Version: 2.1 |

### Joining of Plastic Pipe – Sidewall Heat Fusion

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel join polyethylene plastic pipe and associated fittings using sidewall heat fusion, that this material is installed in a safe and efficient manner so as to minimize anticipated stresses upon the piping and associated fittings as well as eliminate leakage. It describes practices required to comply with §§192.281 through 287.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when joining of plastic pipe using sidewall heat fusion, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public. Avoid using fusion machine in a combustible gas atmosphere.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Polyethylene plastic pipe & associated fittings  
Sidewall Plastic Fusion equipment, as required  
Routine hand tools
- Electrical Power Source
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### Fusion Steps

- a. All pipe and associated fittings must be thoroughly cleaned prior to being joined.
- b. Clean pipe in area to be fused.
- c. Prepare the fusion area surfaces of the main and fitting base. Ensure that the prepared surface extends beyond the intended melt bead area.
- d. Install the sidewall fusion machine on the main.
- e. Align the fitting on the fusion area surface of the main and tighten.
- f. Ensure proper alignment of the fitting to the main.
- g. Retract the fitting from the main using the fusion machine handle and center the preheated, properly sized, and cleaned heater plate between the fitting base and the main.
- h. Press the fitting and heater plate against the main using firm and continuous pressure until a continuous melt beads are observed around the fitting and the main.

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### Joining of Plastic Pipe – Sidewall Heat Fusion

- i. Slightly release the heater plate pressure while continuing the heat soak cycle.
- j. Remove the heater plate only after size of the melt beads around the fitting and the main are acceptable.
- k. Bring the melted fitting and main together using continuous and progressively firm pressure until the final melt bead is achieved.
- l. Maintain fusion pressure until the fitting and main have properly cooled.
- m. Remove the fusion machine and visually inspect the finished fusion for three continuous melt beads around the fitting base.
- n. All three fusion beads should be of uniform size completely around the fitting base.
- o. Defective fusions should be cut out, the main repaired, and the fusion repeated.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

0201 – Visual Inspection of Installed Pipe and Components for Mechanical Damage

0641 – Visually Inspect Pipe and Components Prior to Installation

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | Reactions to AOC, as appropriate  |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 08/26/08 | Version: 2.0 |

### Joining of Plastic Pipe - Electrofusion

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel join polyethylene plastic pipe and associated fittings using electrofusion, that this material is installed in a safe and efficient manner so as to minimize anticipated stresses upon the piping and associated fittings as well as eliminate leakage. It describes practices required to comply with §§192.281 through 287.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when installing polyethylene plastic pipe and associated fitting, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.  
Avoid using fusion machine in a combustible gas atmosphere.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Polyethylene plastic pipe and associated fittings  
Plastic Fusion equipment, as required  
Routine hand tools
- Electrical Power Source
- Soft felt-tip pen, crayon or other markers
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### Electrofusion Steps

- a. Clean pipe ends to be joined.
- b. Ensure that pipe ends are cut squarely removing any cuts, scratches or grooves.
- c. Mark appropriate stab depth on pipe ends.
- d. Surface pipe ends using the properly sized scraper.
- e. Insert pipe ends into fitting. (Use two ea.), electrofusion fittings and a segment of pretested polyethylene plastic pipe when pipe ends do not come closely together or a large section is to be replaced.
- f. When fusing a tapping tee, prepare the fusion area surface of the main. Ensure that the prepared surface extends beyond the intended melt bead area.

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### Joining of Plastic Pipe - Electrofusion

- g. Apply properly sized fitting clamps to maintain fitting and pipe alignment.
- h. Attach electrofusion machine leads to the machine and fitting. Fitting adapters are typically necessary when using a machine and fittings from different manufacturers.
- i. Turn on the electrofusion machine. The machine will read the fitting size and type.
- j. When prompted by the machine, press the fusion button. Fusion and cooling times before rough handling and leak test pressure application, will appear on the machine read out.
- k. After prescribed cooling time, remove leads from fitting and remove alignment clamps.
- l. The fusion machine memory can be downloaded to a computer for a record of the fusion including anomalies such as short stab and misalignment. All unsatisfactory fusions shall be cut out and replaced.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

0201 – Visual Inspection of Installed Pipe and Components for Mechanical Damage

0591 – Leak Test at Operating Pressure

0641 – Visually Inspect Pipe and Components Prior to Installation

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 06/27/16 | Version: 2.1 |

### Joining of Plastic Pipe – Socket Heat Fusion

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel join polyethylene plastic pipe and associated fittings using socket heat fusion, that this material is installed in a safe and efficient manner so as to minimize anticipated stresses upon the piping and associated fittings as well as eliminate leakage. It describes practices required to comply with §§192.281 through 192.287.

#### RESPONSIBILITY

The [City of Thomasville Gas Superintendent](#), or other designee, is responsible to ensure when joining plastic pipe by socket heat fusion, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public. Avoid using fusion machine in a combustible gas atmosphere.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Polyethylene plastic pipe and associated fittings  
Socket Plastic Fusion equipment, as required  
Routine hand tools
- Electrical Power Source
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### Fusion Steps

- a. All pipe and associated fittings must be thoroughly cleaned prior to being joined.
- b. Clean pipe area to be fused.
- c. Ensure that pipe ends are cut squarely removing any cuts, scratches or grooves.
- f. Use a chamfering tool to remove the sharp outer edge of the cut pipe ends.
- g. Install a properly sized depth gauge over the chamfered end of one pipe section.
- h. Install a properly sized cold ring clamp tool just behind the depth gauge and remove the depth gauge.
- i. Pressure must be applied during both heating and joining procedures since socket fusion couplings and heat fusion faces are tapered.
- j. Press the socket coupling onto the male end heat fusion face. Ensure that the socket coupling bottoms-out against the heat fusion face and is held in this position for the complete heating cycle.

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| Prepared by: SIF | Approved by: | Date: |
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### Joining of Plastic Pipe – Socket Heat Fusion

- k. Press the chamfered end of one pipe section onto the female end heat fusion face. Ensure that the cold ring clamp tool is completely against the heat fusion face and is held in this position for the complete heating cycle.
- l. Start the heating cycle time when the cold ring clamp tool is completely against the heat fusion face.
- m. DO NOT TWIST THE PIPE, SOCKET COUPLING, OR THE HEAT FUSION TOOL.
- n. After the proper heating cycle time has elapsed, remove the pipe and socket coupling from the heat fusion tool faces in a linear direction from the heat fusion face in order to avoid angling the melted plastic. Do not twist off the pipe or socket coupling. Do not pull the pipe using the cold ring clamp tool. Quickly observe the melt pattern on both the pipe and socket coupling for 100% melt without cold areas.
- o. Use firm and continuous pressure to press the socket coupling and pipe straight together until the socket coupling makes firm contact with the cold ring clamp tool. This joining should be performed within 3 to 4 seconds after removing the heat fusion tool. Do not push the pipe using the cold ring clamp tool.
- p. Hold the pipe and socket coupling together for the cooling time specified by the pipe and socket coupling manufacturer. Do not twist the pipe or socket fitting.
- q. Relax the holding time pressure after the cooling time has elapsed.
- r. Remove the cold ring clamp tool after the undisturbed cooling time specified by the pipe and socket coupling manufacturer has elapsed.
- s. When the socket fusion joint can be continuously touched by the hand, follow steps a. – r. for the other section of pipe in order to join two sections of pipe with the socket fusion coupling.
- t. Allow the proper additional cooling time before rough handling and leak testing as specified by the pipe and socket coupling manufacturer.
- u. Visually inspect each socket fusion between the pipe and socket fusion coupling for a continuous melt impression of the cold ring clamp tool face around the socket fusion coupling end. No voids or gaps in the melt pattern should be visible.
- v. Alignment of the pipe sections and the socket coupling should be straight.
  - o When socket fusion is used to join two sections of coiled pipe, it is recommended that an “S” fusion pattern with the pipe be used on either side of the socket coupling to ensure that coil curvature does not cause a misalignment and therefore an unacceptable final fusion.
- w. Typical defects in socket fusion include short stabs, misalignments, and over heating. Consult the pipe and fitting manufacturer literature for troubleshooting guidance.
- x. Defective fusions should be cut out and the fusions repeated.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

0201 – Visual Inspection of Installed Pipe and Components for Mechanical Damage  
0641 – Visually Inspect Pipe and Components Prior to Installation

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### Joining of Plastic Pipe – Socket Heat Fusion

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 08/26/08      | Version: 2.0 |

### Welding and Visual Inspection of Welding and Welds

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#### SCOPE AND PURPOSE

This procedure establishes criteria for qualification of pipeline welding procedures and qualification of persons performing welding, according to the established and qualified procedures in accordance with 49 CFR Subpart E, *Welding of Steel in Pipelines*, API Standard 1104, *Standard for Welding Pipelines and Related Facilities* or ASME Section IX, *Boiler and Pressure Vessel Code*. All definitions and materials references comply with the provisions of API Standard 1104 or ASME Section IX, *Boiler and Pressure Vessel Code*.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when welding steel pipe and associated fittings, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

All welding personnel are to utilize proper welding equipment, tools as required for each pipeline weld according to the company's qualified welding procedures.

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

Welding and Visual Inspection of Welding and Welds shall be performed in accordance with the operator's qualified welding procedures.

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| Revision date: 08/26/08      | Version: 2.0 |

### Welding and Visual Inspection of Welding and Welds

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization</li> <li>Odor complaint</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>Improper fitting/component installation</li> <li>Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| B31Q Task #0821         | Page 1 of 3  |
| Revision Date: 10/22/08 | Version: 2.0 |

### Tubeing & Fitting Installation – Instrument, Control, & Sampling

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#### SCOPE AND PURPOSE

This procedure includes the preparation, bending, joining, and installation of instrument, control and sampling line tubing & fittings containing product. It describes the practices required by §192.53.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the preparation, bending, joining, and installation of instrument, control and sampling line tubing & fittings containing product is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Tubing
- Tubing benders
- Tubing cutters
- Hand tools
- Other equipment & materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

The preparation, bending, joining, and installation of instrument, control and sampling line tubing and fittings shall be performed in accordance with the manufacturer's instructions.

##### General Tubing Bending Steps

- a. Inspect the tubing for defects, remove any defects found (i.e. kinks/wrinkles, deep scratches, splits, etc).
- b. All tube bends should be made using tools designed for that purpose.
- c. The bend should be made using a smooth, even bend with minimal flattening, wrinkles, or damage of the tubing.
  - Tubing benders vary by type/manufacturer – use tool in accordance with manufacturer's instructions.
- d. Remove the bent tube from the tubing bender and inspect to ensure that the tubing bend is even with no flattening or other damage to the tubing.

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| B31Q Task #0821         | Page 2 of 3  |
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### Tubeing & Fitting Installation – Instrument, Control, & Sampling

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#### General Tubing Installation Steps

- Inspect the tubing for defects, remove any defects found (i.e. kinks/wrinkles, deep scratches, splits, etc).
- Where practical, blow out or flush the inside tubing and visually inspect the visible inside surface of the tubing are clean and free of debris.
- Install the appropriate fittings prior to any flaring of the tubing ends.
- Ensure that all tubing will be supported and protected as appropriate.

#### General Fitting Installation Steps – Flare-Type Fittings (Generally copper tubing and fittings)

- a. Inspect the tubing/fitting for defects, remove any defects found (i.e. kinks/wrinkles, deep scratches, splits, etc).
- b. Ensure the tubing end to be flared is square – if not, re-cut the tubing using a tubing cutter or other acceptable cutter.
- c. De-burr the tubing end's inner edge with a suitable tool to remove any burrs or other imperfections – Re-round the outside of the tubing as needed.
- d. Ensure that the tubing end is square – file and polish the tubing end as needed with file and/or emery cloth.
- e. Slip the flare-nut onto the tubing – female threaded end facing toward the tubing end.
- f. Insert the tubing into the proper-size hole in the flaring bar. The tubing should protrude above the top of the bar of sufficient height to ensure proper flaring of the tubing – tighten the flaring bar nuts to secure the tubing in place.
- g. Install the flaring yoke, if not already equipped to the flaring bar. Slowly tighten the flaring yoke clockwise – the tubing protruding above the flaring bar will begin to flare (conform) to the shape of the flaring yoke. Tighten the flaring yoke until the tubing, flaring yoke, and flaring adapter have met – DO NOT over-tighten the flaring yoke onto the flaring bar as this may cause cracking or deformation of the tubing.
- h. Turn the flaring yoke counter-clockwise until the flaring yoke is completely removed from the inside of the flared tubing.
- i. Inspect the flared end of the tubing for cracks, splits or other imperfections – remove any imperfections discovered and repeat the flaring process as needed.
- j. Slide the flare-nut toward the end of the flared tubing and visually verify that the flared tubing end fits snugly into the flare-nut.
- k. Install the flared tubing onto the flare-nut by tightening the flare-nut onto the flare fitting – care should be taken not to over-tighten the flare-nut.
- l. Once completed, check fitting for leaks.

#### General Fitting Installation Steps – Compression-Type Fittings

- a. Inspect the tubing/fitting for defects, remove any defects found (i.e. kinks/wrinkles, deep scratches, splits, etc).
- b. Verify that all components of the fitting are present and not intermingled with parts from another fitting (i.e. fitting nuts, ferrules, etc) – verify that any ferrules, etc. are oriented per the manufacturer's instructions.
- c. Align and insert the tubing into the fitting:
  - For those fittings designed with a shoulder/stop, the tubing should be inserted until it bottoms out against the shoulder/stop.

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### Tubing & Fitting Installation – Instrument, Control, & Sampling

- For those fitting without a shoulder/stop, measure and mark the tubing to ensure proper installation.
- d. Tighten nut finger tight – if resistance is felt during this process, remove the tubing from the fitting and inspect the fitting – replace if necessary.
- e. Using two wrenches tighten the fitting nut(s) according to the manufacturer's instructions.
- f. Inspect for proper installation.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0591 – Leak Test at Operating Pressure

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Pressure Deviation</i></b> <ul style="list-style-type: none"> <li>• No Pressure</li> <li>• Unplanned Decrease in Pressure</li> <li>• Unplanned Increase in Pressure</li> </ul>            | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Flow Rate Deviation</i></b> <ul style="list-style-type: none"> <li>• Unplanned Increase in Flow</li> <li>• Unplanned Decrease in Flow &amp; or No Flow</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| B31Q Task #0831         | Page 1 of 2  |
| Revision Date: 10/22/08 | Version: 2.0 |

### Cast-Iron Caulked Bell & Spigot Joints – Installation & Maintenance of Mechanical Leak Clamps

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#### SCOPE AND PURPOSE

This procedure includes the installation and maintenance of mechanical leak clamps on caulked bell and spigot joints. It describes the practices required by §§192.753, 192.755 & 192.489.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the installation and maintenance of mechanical leak clamps is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Leak clamp(s)
- Hand tools
- Other equipment & materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

The installation and maintenance of mechanical leak clamps shall be performed in accordance with the manufacturer's instructions.

##### General Installation Steps

- a. Clean & Inspect the Pipe Joint
  - Clean the pipe joint and bell face thoroughly – ensure the surface area is smooth and clean.
  - Inspect the area for graphitization
    - If general graphitization is found to a degree where a fracture or any leakage may result, that segment **must** be replaced.
    - If localized graphitization is found to a degree where any leakage might result, that segment must be replaced or repaired, or sealed by internal sealing methods adequate to prevent or arrest any leakage.
- b. Re-Caulking and Facing-Up the Pipe Joint
  - Caulked joints should not have caulking extending beyond the bell face – Re-set any caulking and apply, as needed, additional suitable caulking material and ensure that the caulking is even with the bell face.
- c. Assembly

|                   |                              |               |
|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
|-------------------|------------------------------|---------------|

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| Revision Date: 10/22/08 | Version: 2.0 |

### Cast-Iron Caulked Bell & Spigot Joints – Installation & Maintenance of Mechanical Leak Clamps

- Assemble the mechanical leak clamp in accordance with manufacturer’s installation instructions.
- d. Soap Test the Fitting

#### General Maintenance Steps

- If a mechanical leak clamp is found in need of maintenance or leaking:
  - Tighten the bolts on the mechanical clamp in accordance with the manufacturer’s instructions; or
  - Apply a sealant in accordance with approved sealing systems; or
  - Encapsulate the leak; or
  - Replace the leaking segment

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0591 – Leak Test at Operating Pressure

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Flow Rate Deviation</i></b> <ul style="list-style-type: none"> <li>• Unplanned Increase in Flow</li> <li>• Unplanned Decrease in Flow &amp; or No Flow</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |



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| B31Q Task #0841         | Page 1 of 2  |
| Revision Date: 10/22/08 | Version: 2.0 |

### Cast-Iron Joints – Sealing: Encapsulation

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#### SCOPE AND PURPOSE

This procedure includes the sealing of cast-iron joints by encapsulation and inspection of the encapsulation. It describes the practices required by §§192.753, 192.755 & 192.489.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the sealing of cast-iron joints by encapsulation is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Encapsulation bags
- Sealants
- Tools specific for encapsulation
- Hand tools
- Other equipment & materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

The encapsulation of cast-iron joints shall be performed in accordance with the manufacturer's instructions.

##### General Installation Steps

- a. Clean & Inspect the Pipe Joint
  - Clean the pipe joint and bell face thoroughly – ensure the surface area is smooth and clean.
  - Inspect the area for graphitization
    - If general graphitization is found to a degree where a fracture or any leakage may result, that segment **must** be replaced.
    - If localized graphitization is found to a degree where any leakage might result, that segment must be replaced or repaired, or sealed by internal sealing methods adequate to prevent or arrest any leakage.
- b. Assembly
  - Encapsulate the cast-iron joint in accordance with manufacturer's installation instructions.
- c. Test for leaks

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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| <b>B31Q Task #0841</b>  | Page 2 of 2  |
| Revision Date: 10/22/08 | Version: 2.0 |

### Cast-Iron Joints – Sealing: Encapsulation

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0591 – Leak Test at Operating Pressure

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Flow Rate Deviation</b> <ul style="list-style-type: none"> <li>Unplanned Increase in Flow</li> <li>Unplanned Decrease in Flow &amp; or No Flow</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization</li> <li>Odor complaint</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>Improper fitting/component installation</li> <li>Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

|                         |              |
|-------------------------|--------------|
| <b>B31Q Task #0851</b>  | Page 1 of 2  |
| Revision Date: 10/22/08 | Version: 2.0 |

### Internal Sealing – Cast-Iron & Ductile Iron

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#### SCOPE AND PURPOSE

This procedure includes the internal sealing of cast-iron and ductile iron. It describes the practices required by §§192.489, 192.753, & 192.755.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the internal sealing of cast-iron and ductile iron is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Tools specific for internal sealing
- Hand tools
- Other equipment & materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

The internal sealing of cast-iron and ductile iron shall be performed in accordance with the manufacturer's instructions.

##### General Installation Steps

- a. Clean the pipe and prepare the Internal pipe surface
- b. Perform internal sealing
- c. Visually inspect and test for leaks upon completion

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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| <b>B31Q Task #0851</b>  | Page 2 of 2  |
| Revision Date: 10/22/08 | Version: 2.0 |

### Internal Sealing – Cast-Iron & Ductile Iron

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0591 – Leak Test at Operating Pressure

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Flow Rate Deviation</b> <ul style="list-style-type: none"> <li>Unplanned Increase in Flow</li> <li>Unplanned Decrease in Flow &amp; or No Flow</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization</li> <li>Odor complaint</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>Improper fitting/component installation</li> <li>Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| B31Q Task # 0861        | Page 1 of 2  |
| Revision date: 06/25/08 | Version: 2.0 |

### Installation of Steel Pipe in a Ditch

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#### SCOPE AND PURPOSE

This procedure is to provide personnel when installing steel pipe in a ditch with safe and effective activities to ensure the integrity of the piping system. It describes practices required to comply with §192.319.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the installation of steel pipe in a ditch is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Mechanized equipment  
Routine hand tools
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

- Pipes shall be adequately supported while being lowered into the ditch.
- Trench bottom shall be relatively smooth, free of rocks, sticks, and other debris that could damage the pipe and coating.
- When lifting, moving, and lowering pipe into the ditch, be careful to protect the pipe and pipe coating from dents, gouges, nicks, scratches and other damage.
  - When using mechanized equipment, lift the pipe using nylon sling, padded calipers, or other appropriate devices.
  - Pipe should not be dragged or rolled across the ground or other surfaces where rocks and other sharp objects could cause damage to the pipe coating.
  - Avoid impact damage to pipe, such as, dropping heavy objects on the pipe.
- A sufficient clearance between steel piping and other underground structures not associated with the piping must be maintained. If clearance cannot be attained, the piping must be protected from damage that might result from the proximity of other structures.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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| <b>B31Q Task # 0861</b> | Page 2 of 2  |
| Revision date: 06/25/08 | Version: 2.0 |

### Installation of Steel Pipe in a Ditch

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

0641 – Visually Inspect Pipe and Components Prior to Installation

0981 – Backfilling

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Flow Rate Deviation</b> <ul style="list-style-type: none"> <li>• Unplanned Increase in Flow</li> <li>• Unplanned Decrease in Flow &amp; or No Flow</li> </ul>            | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| B31Q Task #0871-0911    | Page 1 of 3  |
| Revision Date: 06/25/08 | Version: 2.0 |

### Installation of Steel or Plastic Pipe in a Bore

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#### SCOPE AND PURPOSE

This procedure provides personnel activities, after boring is completed, with a method of handling and pulling in of pipe. It also includes inspection of exposed pipe and coating for the purpose of ensuring the integrity of the piping system. It describes practices required to comply with 49 CFR Part 192 Subpart G and other applicable code sections.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that proper activities are performed to install pipe as described in this procedure after the boring process.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger

Ensure that all applicable safety equipment is being utilized as per company policy

Personnel shall comply with specific requirements of authorities having jurisdiction for railroads, major thoroughfares, rivers, waterways or other boring processes.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Boring Equipment
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

1. The trail ditch (entry and exit trench or pit) should be relatively smooth, free of rocks and other debris that could damage pipe during pull in or push through. The ditch trail shall be long enough so as not to place unnecessary strain on the pipe as it is being pushed or pulled through the bore hole.
2. Protect pipe from damage by taking practicable precautions when hauling, lifting, moving or handling.
3. When necessary, protect pipe from surface damage before it enters the entry trench by placing padding underneath it.

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| <b>B31Q Task #0871-0911</b> | Page 2 of 3  |
| Revision Date: 06/25/08     | Version: 2.0 |

**Installation of Steel or Plastic Pipe in a Bore**

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**Installation of Plastic Pipe in a Bore**

- a. Inspect pipe before installing through bore hole. Repair or replace any segment of pipe that contains unacceptable surface damage or defect.
- b. Pull or push pipe through bore hole taking care not to put excessive strain on the pipe.
  - i. Tracer wire shall be installed along with pipe as the pipe is pulled or pushed through borehole. The tracer wire must be continuous ensuring electrical continuity for locating purposes. Do not wrap the tracer wire around the pipe.
  - ii. To the extent possible, prevent dirt from entering pipe by sealing the leading end.
- c. Examine pipe as it exits bore hole looking for indications of obvious damage. Repair or replace any segment of pipe that contains unacceptable surface damage or defect.

**Installation of Steel Pipe in a Bore**

- a. Inspect pipe and coating before installing through borehole. Repair or replace any segment of pipe that contains unacceptable surface damage or defect.
- b. Take precautions not to cause any damage to pipe or coating during the installation process.
- c. Ensure that pressure sensitive tape wrap is installed so that the exposed edge of the wrap is facing away from the entry of the borehole.
- d. Pull or push pipe through borehole taking care not to damage the pipe and coating. Use proper pipe handling devices.
  - i. If casing is used during the boring process, the carrier pipe shall be properly supported within the casing.
- e. Examine pipe as it exits bore hole looking for indications of obvious damage. Repair or replace any segment of pipe that contains unacceptable surface damage or defect.



# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Installation of Steel or Plastic Pipe in a Bore

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0641 – Visually Inspect Pipe and Components Prior to Installation

0941 – Install Tracer Wire

0971 – Installation and Maintenance of Casing Spacers, Vents and Seals

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Pipeline Damage</i></b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Flow Rate Deviation</i></b> <ul style="list-style-type: none"> <li>• Unplanned Increase in Flow</li> <li>• Unplanned Decrease in Flow &amp; or No Flow</li> </ul>            | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| <b>B31Q Task #0891</b>  | Page 1 of 2  |
| Revision date: 10/22/08 | Version: 2.0 |

### Field Bending of Steel Pipe

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to perform field bending of steel pipe. It describes practices required to comply with §§192.313 and 192.315.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that field bending of steel pipe is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Mechanized Equipment
- Pipe benders – hand, hydraulic, or mechanical, as appropriate
- Hand Tools
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### General

Field bending of pipe is the activity of making slight bends in the pipe to account for changes in the pipeline route and to conform to the topography. There is a variety of methods, tools and bending apparatus that can be employed. The proper selection must be made pertaining to your particular situation.

##### Steps

- a. Field Bend other than a Wrinkle Bend
  - i. Determine where the bend should be made on the pipe, then mark desired center of bend on the pipe.
  - ii. Restrain pipe on both sides of the desired bend area. Bend pipe to specifications utilizing selected bending tool, apparatus, or equipment. The bending operation shall be done without appreciable flattening or buckling of the pipe.
    - When pipe is bent, the outside of the bend is stretched while the inside is compressed.
    - Minimize thinning of pipe wall by limiting the radius of the bend. The bend shall have a smooth contour and be free from buckling, cracks, or other mechanical damage.
- b. Wrinkle Bend

|                   |                              |               |
|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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| <b>B31Q Task #0891</b>  | Page 2 of 2  |
| Revision date: 10/22/08 | Version: 2.0 |

### Field Bending of Steel Pipe

- i. Use an oxy-acetylene welding torch to heat the pipe where the bend is to be made producing an area of relative weakness.
- ii. Bend the pipe on the heated portion to form a wrinkle in the pipe wall. If done correctly, the bent portion of the pipe will have an outwardly projecting wrinkle. Each successive bend shall be spaced at least one pipe diameter apart (or if more stringent, as specified in company procedures) when measured along the crotch of the bend. The bend must not have any sharp kinks.
- c. Inspection of Completed Field Bends
  - i. Once bend is complete, inspect and examine the bend to ensure it meets the condition for its intended use. The bend must comply with company, pipe manufacturers and authorities having jurisdiction minimum specifications.
  - ii. See Related Procedures for additional steps that are or may be required.

### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

### RELATED PROCEDURES

0151-0201-0641 Visual Inspection of: Buried Pipe and Components When Exposed, for Mechanical Damage, & Prior to Installation, 0991 Coating Application and Repair – Brushed or Rolled  
1001 Coating Application and Repair – Sprayed, 1011 External Coating Application and Repair – Wrapped

### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| B31Q Task # 0901        | Page 1 of 1  |
| Revision date: 06/27/16 | Version: 2.1 |

### Installation of Plastic Pipe in a Ditch

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to ensure the integrity of the piping system while installing plastic pipe in a ditch. It describes practices required to comply with §192.321.

#### RESPONSIBILITY

The [City of Thomasville Gas Superintendent](#), or other designee, is responsible to ensure that the installation of plastic pipe in a ditch performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Establish a safety perimeter to prevent bystanders and unauthorized personnel from entering the area of activity.

Wear a hard hat and high visibility safety vest when working with and around mechanized equipment.

#### EQUIPMENT AND MATERIALS

Mechanized equipment  
Routine hand tools  
Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

- a. Pipes shall be adequately supported while being lowered into the ditch.
- b. Trench bottom shall be relatively smooth, free of rocks, sticks, and other debris that could damage the pipe.
- c. Lower the pipe into the ditch while being careful to protect the pipe from cuts,

gouges, nicks, scratches and other damage during the installation process.

- i. When using mechanized equipment, lift the pipe using nylon sling, padded calipers, or other appropriate devices.
- d. A sufficient clearance between plastic piping and other underground structures not associated with the piping must be maintained. If clearance cannot be attained, the piping must be protected from damage that might result from the proximity of other structures.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

0641 – Visually Inspect Pipe and Components Prior to Installation  
0941 – Install Tracer Wire  
0981 - Backfilling

|              |              |       |
|--------------|--------------|-------|
| Prepared by: | Approved by: | Date: |
|--------------|--------------|-------|

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| B31Q Task #0921-0931    | Page 1 of 4  |
| Revision date: 06/25/08 | Version: 2.0 |

### Installation of Plastic Pipe by Plowing/Pull-In or by Plowing/Planting

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#### SCOPE AND PURPOSE

This procedure is to provide personnel installing plastic pipe by plowing with a safe and effective procedures to ensure the integrity of the piping system.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that plowing operations are performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger

Ensure that all applicable safety equipment is being utilized as per company policy

Personnel shall comply with specific requirements of authorities having jurisdiction for railroads, major thoroughfares, rivers, waterways or other boring processes.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Mechanized equipment designed for plowing in plastic pipe
- Plastic pipe
- Tracer wire

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Prior to Plowing

- Expose all underground facilities in the path of the plowing operation to verify location and depth
- Protect the pipe so it will not be scratched or gouged during the plow-in operation.
- Seal the leading edge of the plastic pipe to be plowed in.

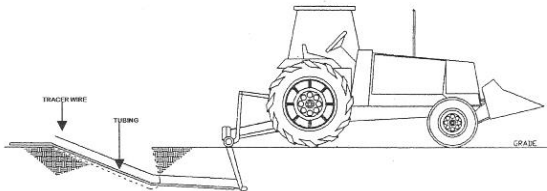
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### Installation of Plastic Pipe by Plowing/Pull-In or by Plowing/Planting

#### For installation by pulling

During a pulling operation the pipe is attached to a plow blade and is pulled through the soil. This creates a potential for pipe damage due to friction between the soil and the pipe. The following steps will minimize the risk of damage to the pipe.

- Dig an entry trench long enough to lower the pipe to burial depth without causing excessive strain on the pipe (see below).



- Attach the pipe to be pulled in to the pulling head (see step j below if a “weak link” is to be attached).
- Care must be taken not to put excessive strain on the pipe being pulled in.
- Tracer wire must be pulled in along with the plastic pipe.
- Protect the plastic pipe that is above ground before it enters the entry trench from damage by placing padding underneath it.
- Take caution to prevent kinking or buckling of the pipe. Any section of pipe containing a kink or buckle must be cut out.
- During the pull, pull force and length of pipe pulled may not exceed the following:

| Pipe Type     | Maximum Force (lbs)* | Maximum Length (ft) |
|---------------|----------------------|---------------------|
| 1/2" CTS MDPE | 195                  | 165                 |
| 1" CTS MDPE   | 420                  | 195                 |
| 1/2" CTS HDPE | 225                  | 190                 |
| 1" CTS HDPE   | 484                  | 225                 |
| 2" PE         |                      | 500                 |
| 4" PE         |                      | 1000                |
| 6" PE         |                      | 1000                |
|               |                      |                     |

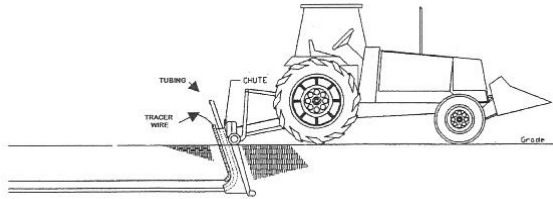
\*Note: Instead of monitoring pulling force it is acceptable to install a “weak link” immediately behind the pull head. To create the weak link, fuse in a 12” length of the next smaller pipe size (e.g. when pulling in 1” PE, fuse in a 12” length of 3/4” PE immediately behind the pull head, when pulling 2” PE, use a 1” pipe for the weak link ...).

|                         |              |
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### Installation of Plastic Pipe by Plowing/Pull-In or by Plowing/Planting

#### For installation by planting

A planted pipe is not pulled through the soil but rather is fed in through the plow blade as the plow moves forward. Because the pipe is not being pulled there is less potential for damage from friction between the pipe and soil, however operators must use caution to ensure the pipe being fed into the plow is not kinked, buckled or otherwise damaged.



- Take caution to prevent kinking or buckling of the pipe. Any section of pipe containing a kink or buckle must be cut out.
- Follow the instructions provided by the manufacturer of the planting equipment
- Tracer wire must be pulled in along with the plastic pipe.

#### After completing the plow in/planting:

- Blow the plastic pipe clear of dirt and debris using compressed air
- Check the tracer wire for continuity. If the tracer wire has broken make necessary repairs.
- Pressure test according to appropriate procedures

### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Installation of Plastic Pipe by Plowing/Pull-In or by Plowing/Planting

#### RELATED PROCEDURES

- 0641 – Visually Inspect Pipe and Components Prior to Installation
- 0941 - Install Tracer Wire

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                             | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Flow Rate Deviation</b> <ul style="list-style-type: none"> <li>• Unplanned Increase in Flow</li> <li>• Unplanned Decrease in Flow &amp; or No Flow</li> </ul>                | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Static Electricity</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>            | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |



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### Install Tracer Wire

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#### SCOPE AND PURPOSE

This procedure is to ensure that insulated tracer wire is installed along with buried non-conductive plastic pipe to serve as a means to accurately locate and trace the pipe when utilizing pipe locators. It describes the practices required to comply with 192.321(e).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the installation of tracer wire is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger  
Ensure that all applicable safety equipment is being utilized as per company policy

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Insulated tracer wire
- Connectors
- Hand tools
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

1. The tracer wire shall be coated (insulated) copper wire. The insulation should cover the copper wire over its entire buried length.
2. During installation of tracer wire, visually inspect the tracer wire as it is being installed, checking for:
  - i. Damaged wire insulation
  - ii. Broken wireRepair or replace any defects discovered during installation.
3. Lay the tracer wire longitudinally parallel to the pipe in the ditch – **DO NOT TAPE TRACER WIRE TO PIPE!!!!** For installation of tracer wire in a borehole, the tracer wire shall be installed at the same time that the plastic pipe is installed.
4. The tracer wire should be installed in a ditch or borehole ensuring that the tracer wire is not pulled taut as to put undue strain on the tracer wire.
5. Protect tracer wire from damage by taking practicable precautions when hauling, lifting, moving or handling.
6. When it is necessary to connect lengths of tracer wire, or to tie into existing tracer wire(s), strip back insulation and use one of the following connection methods:
  - i. Twist wires and wrap with electrical tape.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Install Tracer Wire

- ii. Solder wires and wrap with electrical tape.
- iii. Split bolts
- iv. Electrical connector filled with silicon

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0901 – Installation of Plastic Pipe in a Ditch

0871-0911 – Installation of Steel or Plastic Pipe in a Bore

0921-0931 – Installation of Plastic Pipe by Plowing/Pulling-In or by Plowing/Planting

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>                                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Installation of Pipe Above Ground

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#### SCOPE AND PURPOSE

This procedure ensures the safe and effective handling and installing pipe above ground. It also minimizes anticipated stresses upon the pipe and protection of pipe coating. It describes practices required to comply with 49 CFR Part 192 Subpart G and other applicable code sections.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure installation of pipe above ground is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger  
Ensure that all applicable safety equipment is being utilized as per company policy

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Routine tools
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Aboveground

- Protect pipe from damage by taking practicable precautions when hauling, lifting, moving or handling pipe. Keep out or minimize water, dirt and other foreign matter from entering the pipe.
- Visually inspect the pipe and/or coating for:
  - *Steel Pipe* – dents, gouges, flat-spots, or otherwise damaged, etc. – repair or remove damaged sections (See 49 CFR 192 Subpart G for guidance on acceptable imperfections).
  - *Plastic Pipe* – cuts, gouges, or other damage – repair or remove damaged sections (See 49 CFR 192 Subpart G for guidance on acceptable imperfections).
- All pipe installed aboveground shall be protected from accidental damage by vehicular traffic or other similar causes by either:
  - Installing barricades; or
  - Placing the pipeline at a safe distance from traffic
- Pipeline markers should be installed along the sections of pipeline installed aboveground, where applicable.

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### Installation of Pipe Above Ground

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#### Installation of Steel Pipe Aboveground

- All joints shall be (as appropriate):
  - Welded
  - Threaded
  - Flanged
  - Otherwise joined using methods to resist pullout
- The pipe coating should extend a reasonable distance above ground level.
- Ensure that all aboveground piping is protected from atmospheric corrosion by the use of paint or other acceptable coating.
- Pipe hangers, supports and anchors should be installed:
  - To provide adequate support and anchorage for the pipeline; and
  - To allow the normal expansion and contraction of the pipeline.

#### Installation of Plastic Pipe Aboveground

- Plastic pipe must be installed in a manner that minimizes shear or tensile stresses.
- Plastic pipe may be installed aboveground by:
  - Encasing the plastic pipe in a casing pipe in a manner that will protect the pipe. The leading end of the plastic pipe must be closed before insertion into the casing pipe
    - The casing must be designed to withstand superimposed loads
    - If there is a possibility of water entering the casing, the ends should be sealed
    - If vents are installed on a casing, the vents must be protected from the weather to prevent water from entering the casing
    - The casing should terminate below ground level at both ends
    - Consideration should be given to installing casing spacers to provide adequate separation between the carrier pipe and the casing
  - Plastic pipe may be installed on bridges provided that it is:
    - Installed with protection from mechanical damage, such as in a metallic casing;
    - Protected from ultraviolet radiation; and
    - Not allowed to exceed the pipe temperature limits in §192.123
- Uncased plastic pipe may be installed temporarily aboveground if:
  - It can be demonstrated that the cumulative aboveground exposure of the pipe does not exceed that manufacturer's recommended maximum period of exposure or 2 years, whichever is less
  - The pipe either is located where damage by external forces is unlikely or is otherwise protected against such damage
  - The pipe adequately resists exposure to ultraviolet light and high and low temperatures

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

|                   |                              |               |
|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
|-------------------|------------------------------|---------------|

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Installation of Pipe Above Ground

#### RELATED PROCEDURES

0961 – Above Ground Supports and Anchors-Inspection, Preventive and Corrective Maintenance  
 0971 – Installation and Maintenance of Casing Spacers, Vents and Seals

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>                                   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>Coating Damage</li> <li>Corrosion Damage</li> <li>Dents, Gouges, Scrapes, etc.</li> </ul>                  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline</li> </ul>         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization</li> <li>Odor complaint</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Above Ground Supports and Anchors - Inspection, Preventive and Corrective Maintenance

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#### SCOPE AND PURPOSE

This procedure is to ensure that inspection and preventative and corrective maintenance are properly performed on above ground supports and anchors.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that above ground supports and anchors are inspected and maintained as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to inspect and maintain above ground supports and anchors. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Inspecting Supports and Anchors

- Visually inspect anchors and supports for signs of corrosion or poor coating condition.
- Check for indications that the pipe and/or the anchors and supports have moved or are unstable.
- Check for indications of movement or instability of the ground or structure to which the anchors and supports are attached.

##### Maintaining Supports and Anchors

- Repair coating as necessary, following procedure # 0991 or #1001
- If the anchors or supports are attached to ground or structures that are unstable, corrective options include:
  - shoring up the ground or structure,
  - attaching the anchors or supports to nearby ground or structures that are stable, or
  - relocating the pipe, anchors and supports.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operations and Maintenance Manual.

|                         |              |
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### Above Ground Supports and Anchors - Inspection, Preventive and Corrective Maintenance

#### RELATED PROCEDURES

- 0991 - Coating Application and Repair - Brushed or Rolled  
1001 – Coating Application and Repair - Sprayed

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>Coating Damage</li> <li>Corrosion Damage</li> <li>Dents, Gouges, Scrapes, etc.</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Pressure Deviation</b> <ul style="list-style-type: none"> <li>No Pressure</li> <li>Unplanned Decrease in Pressure</li> <li>Unplanned Increase in Pressure</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization</li> <li>Odor complaint</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>Improper fitting/component installation</li> <li>Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 06/25/08 | Version: 2.0 |

### Installation and Maintenance of Casing Spacers, Vents, and Seals

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#### SCOPE AND PURPOSE

This procedure is to ensure that casing spacers, vents and seals are installed and maintained in a safe and efficient manner so as to minimize damage to the carrier piping and associated fittings. It describes practices required to comply with §§192.323, 192.467 (a) through (d), 192.479, 192.481, and 192.707.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the installation and maintenance of casing spacers, vents and seals is performed in accordance with this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger.  
Ensure that all applicable safety equipment is being utilized as per company policy.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Steel pipe and associated fittings for vents  
Casing spacers and end seals  
Coating system materials, as required
- Proper signage, where required
- Routine hand tools  
Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Installation –

1. Properly sized casing spacers should be selected in order to fit the outside diameter of the carrier pipe and the inside diameter of the casing. The inside casing surface should be relatively smooth to facilitate spacer insertion.
2. Casing spacers should be constructed of a resilient insulating material such as plastic.
3. Install insulating casing spacers close enough together to prevent any possibility of carrier / casing contact due to sagging.
4. Follow the spacer manufacturer recommendations for installing insulating spacers and tightening spacer bolts or clamps. During the insertion process, maintain the correct alignment between the carrier pipe and the casing to prevent damage to spacers or cause spacers to slide on the pipe due to friction or snagging.

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|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
|-------------------|------------------------------|---------------|



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**Installation and Maintenance of  
Casing Spacers, Vents, and Seals**

5. Pulling the carrier pipe through the casing is preferable to pushing the carrier pipe through the casing. Use of an internal compression bullhead and pulling cable is preferred. Insulating spacers can be applied prior to pulling or as the carrier pipe is being pulled.
6. Soil stabilization at both ends of the casing is necessary to eliminate electrical shorting between the carrier pipe and the casing due to long term settling of the carrier pipe. The carrier pipe should be centered in the casing and self-supporting when soil stabilization is completed.
7. End seals are installed to prevent water, soil, and other debris from entering the casing/carrier facility. End seals should not be electrically conductive. Heat-shrink seals and tape seals are common and should be installed in select backfill to protect them from damage. These soft seals commonly do not hold gas pressure. Ensure that properly sized end seals are installed in accordance with manufacturer's recommendations.
8. It is preferable to install weld-on vent pipes before carrier pipe insertion to prevent damage to pipe coating and end seals due to sparks and heat. Vent tops must be designed to prevent water, debris, and insects from entering or plugging the vents. Vents are not required on both ends, but they make good visual markers, good leakage survey points, and good cathodic protection test points.
9. If vents are installed, install signage as applicable by code requirements.

**Maintenance -**

1. Casing end seals may fail over time causing infiltration of water and other debris.
2. Replacement of end seals should be performed according to installation procedures listed in item 7. above.
3. Casing spacers made of resilient insulating material such as plastic seldom fail; therefore, periodic maintenance is not required unless severe carrier or casing pipe movement or damage has occurred.
4. After installation of casing vents, periodic inspection for atmospheric corrosion must be performed according to applicable code requirements.
5. If line markers or other signage is used, maintenance of these facilities must be performed according to applicable code requirements.

**REPORTING/NOTIFICATION**

Complete documentation in accordance with Operation and Maintenance Manual.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Installation and Maintenance of Casing Spacers, Vents, and Seals

#### RELATED PROCEDURES

- 0641 – Visually Inspect Pipe and Components Prior to Installation
- 0981 – Backfilling
- 0991 – Coating Application and Repair – Brushed or Rolled
- 1001 – Coating Application and Repair – Sprayed
- 1011 – External Coating and Repair - Wrapped

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                                      | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| <b>B31Q Task #0981</b>  | Page 1 of 2  |
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### Backfilling

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#### SCOPE AND PURPOSE

This procedure is to ensure that backfill material is selected and placed in a manner that provides firm support for the pipe and that the pipe and pipe coating is not damaged during the backfill process. It describes practices required to comply with §192.319.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that backfilling a ditch is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger  
Ensure that all applicable safety equipment is being utilized as per company policy

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Mechanized equipment
- Pipe protective barrier material
- Routine tools
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

- Verify that the bottom of the excavation is free of rocks or other debris that may cause damage to the pipeline. If necessary:
  - Pad the bottom of the excavation with clean debris-free soil
  - Install "Rock-Shields" or other protective barrier around the pipeline

##### Backfilling

- Prior to backfilling, verify that the pipe is adequately supported so as to minimize stresses and to protect the pipe coating from damage.
- The backfilling operation should be accomplished by "layering" the soil (Adding incremental amounts of backfill material and compacting as needed).
- Using a layer of suitable backfill material (dirt, etc, that is free of rock and other debris that may damage the pipe), begin backfilling, ensuring as much backfill support as needed is placed along the sides and under the pipe to minimize shear and tensile stresses
  - The backfill should be placed in the excavation as evenly as practicable

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### Backfilling

- Depending on conditions such as pipe size, it may be necessary to compact around the sides of the pipeline being backfilled until a suitable layer of backfill material completely covers the pipeline.
- In the case of steel pipe, care shall be taken when compacting the backfill material to prevent damage to the pipeline or coatings.
- In the case of plastic pipe, heavy tamping or compacting shall not be performed until the pipe has a sufficient amount of cover.
- Once a sufficient amount of clean debris-free backfill material has been placed over the pipeline and sufficiently compacted, continue with the backfilling operation:
  - Backfill material above the initial layer may contain small amounts of rock or other debris.
  - Tamp or compact each layer of backfill material, as needed, as it is placed into the excavation

### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

### RELATED PROCEDURES

0861 – Installation of Steel Pipe in a Ditch

0901 – Installation of Plastic Pipe in a Ditch

### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>● Blowing/Escaping gas/Grade I leak</li> </ul>                                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>● Fire on a pipeline</li> <li>● Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Pipeline Damage</i></b> <ul style="list-style-type: none"> <li>● Coating Damage</li> <li>● Corrosion Damage</li> <li>● Dents, Gouges, Scrapes, etc.</li> </ul>                  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>● Low odorization</li> <li>● Over odorization</li> <li>● Odor complaint</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 06/25/08 | Version: 2.0 |

### Coating Application and Repair – Brushed or Rolled

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#### SCOPE AND PURPOSE

This procedure is to ensure proper surface preparation and application or repair of coatings using a brush or roller. It describes practices required to comply with §§192.461, 192.479 and 192.481.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that proper surface preparation and application of coating to pipe is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

When applicable, suitable personal protection equipment must be used commensurate with the task performed; i.e., eye protection, respiratory protection.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Primer(s), as needed
- Paint or coating, as needed
- Routine tools
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

Because of the various types of coatings available, some general procedures for applying brushed or rolled coatings are listed below.

All pipe coatings should be applied in accordance with the manufacturer's application instructions.

- Store, handle and transport coating material(s) in such a manner as to prevent damage or contamination.
- Prepare the pipe surface by ensuring that all surface rust, dirt, oil, grease, loose coatings, or other foreign material is cleaned from the pipe surface.
  - Welded joints may need to be wire brushed with a power wire brush or other method that will remove slag or other loose particles.
- Ensure that the pipe surface is free of moisture and remains free of moisture during the coating process.
- Apply coating evenly to pipe, fittings, and components ensuring adhesion and complete coverage.
- The finished coat should not be disturbed until the coating has thoroughly dried – refer to manufacturer's specifications for drying time.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Coating Application and Repair – Brushed or Rolled

- For pipelines extending from underground to aboveground, the coating shall extend a reasonable distance above ground level.
- Inspect the final coating for verification that coating has been applied correctly.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0141- Visual Inspection for Atmospheric Corrosion

0171-0191 – Measure External Corrosion/Measure Atmospheric Corrosion

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Pipeline Damage</i></b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                                      | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| <b>B31Q Task #1001</b>  | Page 1 of 2  |
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### Coating Application and Repair - Sprayed

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel install steel and associated fittings above ground that this material is sprayed with a protective coating so as to minimize atmospheric corrosion of the piping and associated fittings. It describes practices required to comply with §§192.479 & 481.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when installing steel pipe and associated fittings above ground, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Coating system sprayer (compressed air, airless, aerosol cans)
- Rust resistant paint system, including primer if required (enamel or epoxy)
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

- a. All pipe and associated fittings must be thoroughly cleaned prior to being coated.
- b. All rust must be removed using hand or power brushing. Sandblasting, power sanding, and power grinding should be avoided, whenever possible.
  - Care must be taken not to remove metal.
- c. All existing coating that is damaged and or disbonded must be repaired or replaced, especially at pipe-to-soil interfaces, and at pipe supports.
- d. Apply primer coat, if required, evenly to the cleaned piping surface according to paint manufacturer directions. Allow primer coat to dry thoroughly.
- e. Apply outer paint coat evenly to the primed piping surface according to paint manufacturer directions. Allow outer paint coat to dry thoroughly. A second outer paint coat may be applied as deemed necessary.
- f. Piping spans across waterways and under bridges must also be coated.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

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|------------------|------------------------------|---------------|
| Prepared by: SIF | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Coating Application and Repair - Sprayed

#### RELATED PROCEDURES

- 0141 – Visual Inspection for Atmospheric Corrosion
- 0191 – Measure Atmospheric Corrosion
- 0991 – Coating Application and Repair – Brushed or Rolled
- 1011 – External Coating Application and Repair – Wrapped

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                                      | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |



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| Revision date: 06/25/08 | Version: 2.0 |

### External Coating Application & Repair – Wrapped

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#### SCOPE AND PURPOSE

This procedure is to ensure proper surface preparation and application or repair of coatings using a wrap. It describes practices required to comply with §§192.461, 192.479 and 192.481.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure coating application by wrapping is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger  
Ensure that all applicable safety equipment is being utilized as per company policy

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Primer(s), as needed
- Wrap
- Mastic
- Routine tools
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

Because of the various wrap-type coatings available, some general procedures for applying wrapped coatings are listed below.

All coatings should be applied in accordance with the manufacturer's instructions.

- Store, handle and transport coating material(s) in such a manner as to prevent damage or contamination.
- Prepare the pipe surface by ensuring that all surface rust, dirt, oil, grease, loose coatings, or other foreign material is cleaned from the pipe surface.
  - Welded joints may need to be wire brushed with a power wire brush or other method that will remove slag or other loose particles.
- Remove excess water or moisture from the pipe surface.
- Apply a coat of primer, if application calls for it, using accepted methods such as by brush or roller:
  - Ensure that the primer is applied evenly across the area to be wrapped
  - The primer shall be thoroughly mixed prior to application.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### External Coating Application & Repair – Wrapped

- Allow the primer to dry the recommended drying time (in most cases, dry to the touch).
- Apply the wrap using a slight tension in a spiral configuration with sufficient overlapping of the wrap to ensure proper coverage taking care to minimize wrinkling of the wrap.
- If wrapping a pipeline that is to be pulled through a borehole, ensure that the wrap is applied so that the exposed edge of the wrap faces opposite to the borehole.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0151 – Visual Inspection of Buried Pipe and Components When Exposed

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | Reactions to AOC, as appropriate  |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                                      | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 06/25/08 | Version: 2.0 |

### Install Mechanical Clamps and Sleeves – Bolted

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#### SCOPE AND PURPOSE

This procedure is to provide personnel when installing bolted mechanical clamps and sleeves with safe and effective activities to ensure the integrity of the piping system.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the installation of bolted mechanical clamps and sleeves is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Ensure that the work zone/area is setup to protect the public from danger  
Ensure that all applicable safety equipment is being utilized as per company policy

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Bolted mechanical clamps
- Bolted mechanical sleeves
- Routine tools
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

Due to the variety of bolted mechanical clamps and sleeves available, this procedure lists general procedures for installing mechanical clamps and sleeves. All mechanical clamps and sleeves should be applied in accordance with the manufacturer's installation instructions.

##### Installation

- Prior to installation, verify that the proper mechanical clamp or sleeve has been selected. When selecting a mechanical clamp or sleeve, consideration should be given to the following:
  - Pipe Size
  - Pipe Material
  - Operating Pressure
  - Type of repair
    - Permanent
    - Temporary
- Visually examine the mechanical clamp or sleeve for possible defects or missing parts.
- Prepare the pipe section for installation of mechanical clamp or sleeve.

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### Install Mechanical Clamps and Sleeves – Bolted

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- The pipe section should be free of dents, gouges, excessive scrapes, or other abnormalities (pipe out-of-round, etc) that may prevent the proper installation of the mechanical clamp or sleeve and prevent a gastight joint.
- For steel pipe:
  - Remove any coatings, dirt, rust or other debris for a reasonable distance on both sides where the mechanical clamp or sleeve is to be installed.
- For plastic pipe:
  - Thoroughly clean the pipe with a clean rag to remove any dirt, dust, or other debris.
- Install the mechanical clamp or sleeve
  - Install the mechanical clamp or sleeve in accordance with the manufacturer's installation instructions.
- Leak test the mechanical clamp or sleeve to verify a gastight joint using acceptable leak-test methods such as, but not limited to:
  - Pressure tests
  - Soap tests
- If applicable, prepare and apply protective coatings as necessary.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Install Mechanical Clamps and Sleeves – Bolted

#### RELATED PROCEDURES

0641 – Visually Inspect Pipe and Components Prior to Installation

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>Coating Damage</li> <li>Corrosion Damage</li> <li>Dents, Gouges, Scrapes, etc.</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization</li> <li>Odor complaint</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>Improper fitting/component installation</li> <li>Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| <b>B31Q Task #1051</b>  | Page 1 of 2  |
| Revision date: 08/26/08 | Version: 2.0 |

### Fit-up of Weld Type Repair Sleeve

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#### SCOPE AND PURPOSE

This procedure is to ensure when personnel install a steel weld type repair sleeve, it is performed according to accepted industry practices. It describes practices required to comply with §192 Subpart E – Welding of Steel in Pipelines.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when installing a steel weld type repair sleeve, that it is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Steel weld type repair sleeve (properly sized)
- Routine hand tools
- Other equipment and materials, as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS (General)

- a. All pipe and associated fittings must be thoroughly cleaned prior to being coated.
- b. All rust must be removed using hand or power brushing. Sandblasting, power sanding, and power grinding should be avoided.
  - Care must be taken not to remove metal.
- c. All existing coating material on the pipe must be removed beyond the area to be welded.
- d. If severe corrosion is present, complete cylindrical pipe segment replacement should be considered.
- f. Fit the weld type repair sleeve to the pipe with the longitudinal bevel surfaces in a horizontal position.
- g. Ensure that the weld type repair sleeve makes complete contact with the pipe surface along each longitudinal bevel surfaces and the circumferential bevel surfaces.
- h. External weld clamps may be used to ensure a tight fit to the pipe.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

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| Prepared by: SIF | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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# City of Thomasville Natural Gas

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### Fit-up of Weld Type Repair Sleeve

#### RELATED PROCEDURES

- 0151 – Visual Inspection of Buried Pipe and Components When Exposed
- 0171 – Measure External Corrosion
- 0641 – Visually Inspect Pipe and Components Prior to Installation
- 0801-0811 – Welding and Visual Inspection of Welding and Welds

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                                      | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 10/22/08 | Version: 2.0 |

### Install Composite Sleeves

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to ensure the integrity of the piping system when installing composite sleeves.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that installation of composite sleeves is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Composite Sleeve
- Filler Material
- Adhesive
- Hand Tools
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

Many variations of composite sleeve wrap systems are available. Consult manufacturer's instructions for complete information on installation technique.

##### Steps

- a. Prepare pipe for installation of composite sleeve by removing any protective wrap or coating and clean pipe to bare metal condition.
- b. Apply strength filler material over the damaged area of pipeline to prevent the weakened pipe wall from further yield.
- c. Mix adhesive and apply to pipe surface and to each successive wrap of the composite coil. The adhesive is spread in between each layer as the sleeve is wrapped around the pipeline. The sleeve should extend a reasonable distance beyond both sides of the defect.
- d. Tighten wrap until all excess adhesive and strength filler material is squeezed out of the sleeve.
- e. Allow repair to cure before backfilling and restoring pipeline environment.



# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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| <b>B31Q Task #1061</b>  | Page 2 of 2  |
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### Install Composite Sleeves

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

None

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | Reactions to AOC, as appropriate  |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>Coating Damage</li> <li>Corrosion Damage</li> <li>Dents, Gouges, Scrapes, etc.</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization</li> <li>Odor complaint</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>Improper fitting/component installation</li> <li>Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 10/22/08 | Version: 2.0 |

### Repair of Steel Pipe by Grinding

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to repair steel pipe by grinding. It also describes verification of minimum wall thickness requirements. It describes practices required to comply with §192.309(a)(1) & (2).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that repair of steel pipe by grinding is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Company Records
- Pipe Pit Depth Gauge
- Power and Hand Tools
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### Steps

- a. Determine whether the pipe can be repaired by grinding. Take an external measurement of pipe wall thickness utilizing a pipe pit depth gauge. Refer to company records for pipe size, grade, wall thickness, present and proposed MAOP.
- b. Grinding may be used to repair steel pipe if the defect is a shallow crack or gouge; however, the crack or gouge shall be unacceptable when it exceeds a predetermined size as indicated in operation and maintenance manual. Removal of material by hand filing or power disk grinding constitutes a repair of a defect if after the repair, the remaining wall thickness is equal to or greater than:
  - (1) The minimum thickness required by the tolerances in the specification to which the pipe was manufactured; and
  - (2) The nominal wall thickness required for the design pressure of the pipeline.
- i. After the defect has been repaired, the pipe shall have a smooth curved contoured surface.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Repair of Steel Pipe by Grinding

- c. Determine remaining wall thickness by subtracting the repair depth from the original wall thickness.
- d. Reference company procedures for acceptable limits of metal loss.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0171 - Measure External Corrosion

0191 - Measure Atmospheric Corrosion

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Pipeline Damage</i></b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

Prepared by: SRCS

Approved by: Jeremy Reynolds

Date: 9/22/14

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| <b>B31Q Task #1081</b>  | Page 1 of 3  |
| Revision date: 08/26/08 | Version: 2.0 |

### Tapping a Pipeline (Tap Diameter 2 Inch and Less)

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to ensure the integrity of the piping system when tapping a pipeline (Tap Diameter 2 Inch and Less) after the fitting has been installed. It also includes installation and removal of the isolation valve. It describes practices required to comply with §192.627.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that tapping operations are performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Tapping and Completion Machine
- Machine Adapter
- Cutting Grease
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### General

- Fitting has been installed onto pipe.

##### Tapping Steps

- a. Attach appropriate isolation valve to fitting.
- b. Fully open isolation valve.

##### Attachment, Operation and Removal of Drilling Machine

- c. Attach machine adapter, boring bar, shell cutter and pilot drill onto drilling machine. The cutter and pilot bit should be thoroughly coated with cutting grease. Retract the boring bar to rearmost position.
- d. Place drilling machine and machine adapter onto isolation valve and securely tighten.
- e. Advance the boring bar by hand until the pilot drill contacts the pipe, then slightly retract so as to prevent starting the drilling operation in a bind.

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**Tapping a Pipeline (Tap Diameter 2 Inch and Less)**

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- f. Determine travel distance. Mark the point on the body of the drilling machine that the feed tube will reach when drilling is complete.
- g. Operate the drilling machine advancing cutter until the pilot bit penetrates the pipe, and then continue drilling as the cutter penetrates the pipe till the cut is complete.
- h. Check completion of cut by attempting to advance cutter by rotating feed crank, if the boring bar does not advance easily, the cut is not complete.
- i. When the cut is complete, retract boring bar to its rearmost position ensuring cutter and pilot bit clears the valve gate. The coupon should be contained in the shell cutter.
- j. Securely close the isolation valve.
- k. Remove the drilling machine and machine adapter as a unit from the isolation valve. If necessary, clear pipe shavings and debris left from tapping operation.

Insertion of Completion Plug, Removal of Isolation Valve and Attachment of Completion Cap

- l. Attach completion machine assembled with inserting tool and completion plug to isolation valve. Open the isolation valve and advance inserting bar. Screw completion plug into fitting.
- m. Remove plug inserting tool from the completion plug and withdraw shaft to rearmost position.
- n. Close isolation valve.
- o. Remove completion machine and adapter as a unit from the isolation valve.
- p. Partially open isolation valve to ensure completion plug is properly seated, then remove isolation valve from fitting.
- q. Securely tighten completion plug, then apply pipe joint compound to male threads and attach completion cap.

**REPORTING/NOTIFICATION**

Complete documentation in accordance with Operation and Maintenance Manual.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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| <b>B31Q Task #1081</b>  | Page 3 of 3  |
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### Tapping a Pipeline (Tap Diameter 2 Inch and Less)

#### RELATED PROCEDURES

- 0801-0811 – Welding and Visual Inspection of Welds and Welding
- 0981 - Backfilling
- 0991 – Coating Application and Repair – Brushed or Rolled
- 1011 – External Coating Application and Repair - Wrapped
- 1131 – Stopper (Stopple) Pipe

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Pipeline Damage</i></b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                                      | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| <b>B31Q Task #1091</b>  | Page 1 of 3  |
| Revision date: 08/26/08 | Version: 2.0 |

### Tapping a Pipeline (Tap Diameter Greater Than 2 Inch)

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to ensure the integrity of the piping system when tapping a pipeline (tap diameter greater than 2 inch) after the fitting has been installed. It also includes installation and removal of the isolation valve. It describes practices required to comply with §192.627.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that tapping operations are performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Tapping and Completion Machine
- Machine Adapter
- Valve Adapter
- Cutting Grease
- Hand Tools
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

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| <b>B31Q Task #1091</b>  | Page 2 of 3  |
| Revision date: 08/26/08 | Version: 2.0 |

**Tapping a Pipeline (Tap Diameter Greater Than 2 Inch)**

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**General**

- Fitting has been installed onto pipe.

**Tapping Steps**

- Attach appropriate isolation valve to fitting.
- Fully open isolation valve.
- Perform “dry run” alignment of completion plug. Attach completion machine assembled with alignment tool and completion plug to the isolation valve. Advance shaft until completion plug contacts fitting threads. If necessary, slightly shift the isolation valve on the fitting and possibly the completion machine to align the completion plug threads with the fitting threads. Rotate shaft until completion plug threads are engaged with fitting threads and securely bolt isolation valve to fitting. Rotate shaft in the opposite direction until completion plug is unscrewed from fitting and withdraw shaft to rearmost position. Remove completion machine with alignment tool and completion plug from the isolation valve.

Attachment, Operation and Removal of Drilling Machine

- Attach the proper size machine adapter to the body of the drilling machine, then attach the drilling machine with equipment and adapter “assembled” onto the isolation valve. The cutter and pilot bit should be thoroughly coated with cutting grease.
- Raise and lower the boring bar until contact is made with the pipe. This ensures there are no obstructions. Advance boring bar until pilot drill contacts the pipe, then slightly retract.
- Determine travel distance. Measure the travel required to complete the drilling operation.
- Operate the drilling machine advancing cutter until the pilot bit penetrates the pipe. Continue drilling as cutter penetrates the pipe. The feed indicator will read the distance on the travel chart.
- Check completion of cut by attempting to advance cutter by rotating feed crank. If the boring bar does not advance easily, the cut is not complete.
- When the cut is complete, retract boring bar to its rearmost position ensuring cutter and pilot bit clears the valve gate. The coupon should be contained in the shell cutter.
- Securely close the isolation valve. Be careful not to force valve closed as that may destroy the rubber seat of the valve.
- Remove drilling machine and adapter as a unit from the isolation valve. If necessary, clear pipe shavings and debris left from tapping operation.

Insertion of Completion Plug, Removal of Isolation Valve and Attachment of Completion Cap

- Attach completion machine assembled with inserting tool and completion plug to the isolation valve. Open the isolation valve and advance completion machine shaft. Screw completion plug into fitting.
- Remove plug inserting tool from the completion plug and withdraw shaft to rearmost position.
- Bleed off pressure from the isolation valve to ensure completion plug is properly seated.
- Remove completion machine, valve adapter and isolation valve.
- Bolt completion flange with proper gasket solidly to fitting flange.



# City of Thomasville Natural Gas

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| <b>B31Q Task #1091</b>  | Page 3 of 3  |
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### Tapping a Pipeline (Tap Diameter Greater Than 2 Inch)

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0801-0811 – Welding and Visual Inspection of Welds and Welding

0981 - Backfilling

0991 – Coating Application and Repair – Brushed or Rolled

1011 – External Coating Application and Repair - Wrapped

1131 – Stopper (Stopple) Pipe

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Pipeline Damage</i></b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                                      | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| B31Q Task # 1101       | Page 1 of 2  |
| Revision date: 4/14/08 | Version: 2.1 |

### Tapping a Pipeline with a Built-in Cutter

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#### SCOPE AND PURPOSE

This procedure provides personnel activities for tapping a pipeline with a built-in cutter after the fitting has been installed. It describes practices required to comply with §192.627.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that tapping a pipeline with a built-in cutter is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

- Do not perform tapping operations until ignition and potential ignition sources are eliminated.
- Whenever tapping operations are in progress, a fire extinguisher must be present at the tapping site placed at a suitable location, upwind if possible.
- Suitable personal protection equipment must be used by personnel commensurate with the tapping operation.
- Establish a safety perimeter to prevent bystanders and unauthorized personnel from entering the tapping area.
- Consult manufacturer's installation and operating instructions for complete information on the uses of different types and styles of self tapping service tees.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Tapping tools per manufacturer's instructions
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform tapping a pipeline with a built-in cutter. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

- a. Tap the main using appropriate tools.
  - i. Rotate cutter until it contacts main.
  - ii. Continue to rotate as the cutter penetrates through the pipe wall and the operator feels the seating of the tool on the pipe.
- b. To admit gas through the tap, rotate tool counterclockwise until top of the tool is flush with top of tapping tee.
  - i. For a steel tapping tee, apply pipe dope to threads and securely tighten cap.
  - ii. For a plastic tapping tee, securely tighten cap onto threads until "O" ring makes a complete seal – do not overtighten.
  - iii. Leak test using soapy water solution (soap bubbles).

|                         |              |
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| <b>B31Q Task # 1101</b> | Page 2 of 2  |
| Revision date: 4/14/08  | Version: 2.1 |

### Tapping a Pipeline with a Built-in Cutter

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

- 1081 – Tapping a Pipeline (Tap Diameter 2- inch and Less)
- 1091 – Tapping a Pipeline (Tap Diameter greater than 2-inch)
- 1111 – Tapping Cast and Ductile Iron Pipe, and Low Pressure Steel Pipe
- 0561 – Pressure Test-Non-liquid Medium-Test Pressure Less Than 100 psi
- 0571 – Pressure Test-Non-liquid Medium-Test Pressure Greater Than or Equal to 100 psi

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | Reactions to AOC, as appropriate  |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                                      | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 08/26/08 | Version: 2.0 |

### Stopper (Stopp) Pipe

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to ensure the integrity of the piping system for pipeline stopping. It includes the insertion and removal of a stopper (stopp).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that stopper (stopp) pipe is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Stopping Machine with Attachments
- Rubber Lubricant
- Hand Tools
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### General

Fitting has been installed onto pipe and isolation valve attached to fitting.

##### Stopping Steps

- Advance the inserting bar of stopping machine until fully extended. Attach stopper to the inserting bar and apply rubber lubricant. Withdraw inserting bar to the rearmost position.
- Securely tighten stopping machine onto isolation valve.
- If appropriate, equalize pressure across the isolation valve.
- Fully open isolation valve.
- Stopp pipe by advancing inserting bar with attached stopper into fitting. Continue to advance until stopper contacts bottom of fitting. Set stopper to stop off line.
  - \* Whenever two stopping machines are being utilized for the installation of a by-pass line to maintain service around a section of pipe to be isolated on a single-fed line, pay close attention to the manufacturer's instructions for sequencing.
- Verify pressure and monitor during performance of work.
- Relieve pressure: At this point, stopper tightness can be determined.

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### Stopper (Stopp) Pipe

- \* When using one stopping machine, once the stopper has been set, pressure can be relieved through the blow down connection.
- \* When using two stopping machines, once the stoppers have been set, relieve pressure between the stopped off section of pipe.

- h. Once performance of desired work has been completed, retract stopper(s) from fitting.
- i. Close the isolation valve.
- j. Remove stopping machine from the isolation valve.
- k. **For Insertion of Completion Plug, Removal of Isolation Valve and Attachment of Completion Cap/Flange,** refer to Related Procedures #1081 or #1091.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

- 1081 – Tapping a Pipeline (Tap Diameter 2 Inch and Less)
- 1091 – Tapping a Pipeline (Tap Diameter greater than 2 inch)

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Pipeline Damage</i></b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                                      | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 06/27/16 | Version: 2.0 |

### Stopper Pipe – Manual Expanding (Service Lines)

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to ensure the integrity of the piping system for pipeline stopping. It includes the insertion and removal of a stopper into small diameter steel lines as a temporary means of stopping the gas flow.

#### RESPONSIBILITY

The [City of Thomasville Gas Superintendent](#), or other designee, is responsible to ensure that this task is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Stopper

Safety Equipment, PPE

Bonding Cables

Hand Tools

Other Equipment and Materials as Needed

Consideration should be given to the hazards associated with working in a gaseous atmosphere and the necessary safety precautions should be taken.

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### General

Expandable stoppers are generally used in situations where a quick temporary means of shutting off the gas flow is necessary in smaller diameter lines where no valve is accessible. Consideration should also be given to pipe pressure as expandable stoppers should only be used within the pressure ratings of the manufacturer.

Listed below are general procedures for the installation of expandable stoppers into steel gas lines. In any case, the manufacturer's instructions shall be followed.

##### Instructions

- Identify the correct size expandable stopper for the pipe that will be stopped off.
- Prepare the pipe for the insertion of the expandable stopper:

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| Prepared by: | Approved by: | Date: |
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| Revision date: 06/27/16  | Version: 2.0 |

### Stopper Pipe – Manual Expanding (Service Lines)

- i. If the line is not already separated, ensure bonding cables are installed across the area to be separated to provide an electrical conduit to help prevent arcing at the point of separation.
  - o Separate the pipe using the appropriate tool
  - o In some cases, the inside wall of the pipe may have to be reamed using a pipe reamer in order for the expandable stopper to fit inside the pipe.
  - o Insert the expandable stopper into the gas line, being sure to hold the stopper securely against the flow of pressurized gas and tighten the wing-nut or T-handle clockwise. This process will cause the expandable stopper to expand against the inside wall of the pipe stopping the flow of gas.
  - o To remove the expandable stopper, hold the end of the stopper securely and turn the wing-nut or T-handle counter-clockwise until the stopper becomes loose and pull the stopper out of the pipe.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Pipeline Damage</i></b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                                      | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 4/14/08    | Version: 2.1 |

**Squeeze off Plastic Pipe**

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**SCOPE AND PURPOSE**

This procedure is to provide personnel performing squeeze off operations on plastic pipe with a safe and effective procedures to ensure the integrity of the piping system.

**RESPONSIBILITY**

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that squeeze off operations are performed as described in this procedure.

**PERSONNEL SAFETY (Where Applicable)**

- Personnel should be aware of the possibility of electro-static build up in PE pipelines.
- As a general safety precaution, squeeze offs should be performed in a separate bell-hole/location from blowing/escaping gas.
- As a general safety precaution, squeeze-offs should be performed in a separate bell-hole/location from blowing/escaping gas. Consideration should also be given to applying a wet rag/tape to the pipe surface and spraying the area to be squeezed with a fine water or soapy water mist to aid in the dissipation of any possible static buildup.
- Pipe and squeeze off tools should be properly grounded.

**EQUIPMENT AND MATERIALS**

Necessary equipment and materials to perform the task, such as, but not limited to:

- Squeeze off tool equipped with over-squeeze protection stops
- Static Electricity Elimination Tools
- System maps and drawings as needed
- Other equipment and materials as needed

**OPERATOR QUALIFICATION**

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform squeeze off on plastic pipe. Refer to the OQ Plan for specific qualification requirements.

**INSTRUCTIONS**

Squeeze Off

- a. Verify the correct pipeline segment and proper location for the squeeze off.
- b. Squeeze-off tools shall be selected and operated in accordance with the manufacturer’s instructions.
- c. Tools must be electrically grounded before they are brought near or attached to the pipe. Tool should be equipped with ground cables and ground rods. If they are not so equipped, these can be installed by using a set of jumper cables with a ground rod. Static electricity ignition prevention steps and pipe and tool grounding measures must be in place and monitored throughout the squeeze off and associated operations.
- d. Inspect the outside pipe wall for surface damage and remove any dirt or debris in the area to be squeezed (make sure tracer wire will not interfere with the squeeze-off).
- e. Place the tool on the pipeline to be shut down, avoiding existing fittings and joints that could be affected by the pipe deformation.

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| Prepared by: SIF | Approved by: Jeremy Reynolds | Date:9/22/14 |
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**Squeeze off Plastic Pipe**

- f. Using the proper squeeze tool, and with proper gap stops, perform the squeeze. Operate the tool slowly, allowing the plastic to conform to the compressed shape slowly to prevent damage to the pipeline.
- g. If the squeeze-off tool is equipped with a locking device to prevent the separation of the squeeze-off tools bars/ jaws, lock the bars/jaws of the squeeze-off tool.
- h. DO NOT OVER-SQUEEZE THE PIPE!!!!

Tool Removal

- i. When the project is complete slowly remove the squeezer allowing the pressure to equalize in the system and allow the pipe to return to its original shape to prevent damage to the pipe wall.
- j. Before removing the tool, examine the squeeze location on the pipe. If the pipe has not returned to a round shape, rotate the squeeze tool 90 degrees and slowly squeeze the pipe back towards a round shape.
- k. Inspect the squeezed-off section of the pipe for damage. Permanently mark the squeeze location and note the squeeze location on the appropriate forms or drawings and proceed with backfilling.

**REPORTING/NOTIFICATION**

Complete documentation in accordance with Operation and Maintenance Manual.

**RELATED PROCEDURES**

None

**ABNORMAL OPERATING CONDITIONS**

| <b>AOC Main Category</b> & Examples of Specific AOCs   | Reactions to AOC, as appropriate  |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b><br><ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b><br><ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b><br><ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                             | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b><br><ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Static Electricity</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b><br><ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>            | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Squeeze Off Steel Pipe

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to ensure the integrity of the piping system when performing squeeze off of steel pipe.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that squeeze off operations are performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Squeeze Tool
- Company Maps and Records
- Hand Tools
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### Squeeze Off Steps

- a. Verify the correct pipeline segment and proper location for the squeeze off. Determine whether the line has one-way or two-way feed. If possible, the squeeze tool should be located a reasonable distance away from fittings.
- b. Use squeeze tool to shut off gas flow to pipeline segment.
  - i. Select the proper size squeeze tool for the pipe to be squeezed. The correct squeeze bars for the various size pipe must be used.
  - ii. Position squeeze tool onto pipe. The squeeze tool should be upright, centered and square on the pipe. If possible, the longitudinal seam of the pipe should be facing directly under the upper jaw or directly above the lower jaw of the squeeze tool.
  - iii. Compress pipe by operating the closing mechanism. Flatten the pipe between the upper and lower jaws shutting off gas flow.
    - If available, engage the accidental release prevention mechanism. Some squeeze tools require installation of saddle clamps; others automatically lock.
- c. Close valve in the system nearest squeeze point or attach and close isolation valve.
- d. Verify system pressure and monitor during performance of work.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Squeeze Off Steel Pipe

- e. Release closing mechanism and remove squeeze tool from pipe.
  - i. If available, disengage the accidental release prevention mechanism or remove clamps.
- f. Perform necessary work.
- g. Once the project is complete, open valve allowing pressure to equalize in the system and purge air from line.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

1141 – Squeeze off Plastic Pipe

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                             | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Static Electricity</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>            | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Installation of Customer Meters & Regulators – Residential & Commercial

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#### SCOPE AND PURPOSE

This procedure is to ensure that meters and regulators for residential and small commercial customers are installed so as to minimize anticipated stresses upon the connecting piping and the meter. It describes practices required to comply with §192.357.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure when hanging a meter, regulator and associated piping, commonly called a “meter set” is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Be aware of any environment that can pose a threat to personnel safety.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Meter
- Regulator
- Associated piping and fittings
- Routine tools
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

The meter and regulator selected should provide the customer/premise with the proper delivery pressure and volume.

All meters and regulators shall be installed and operated in accordance with the manufacturer’s installation and operating instructions.

##### Meter/Regulator Location (Outside)

- Wherever possible, the meter and regulator should be installed adjacent to the building being served.
- Verify that the location chosen is sufficient to protect from potential damage by forces such as:
  - Vehicles
  - Construction
  - Equipment
  - Falling objects

|                   |                              |               |
|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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### Installation of Customer Meters & Regulators – Residential & Commercial

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- Snow and Ice
- Verify that the meter and/or regulator will be installed in a readily accessible location to accommodate access for:
  - Obtaining readings
  - Inspections/Testing
  - Repairs
  - Meter/regulator maintenance
  - Operation of the gas shut-off valve
- Verify that the service regulator vents and relief vents terminate outdoors, and that the outdoor terminal is:
  - Rain and insect resistant
  - Located at a place where gas from the vent can escape freely into the atmosphere and away from any opening into the building
  - Protected from damage caused by submergence in areas where flooding may occur
- Verify that the meter or regulator will **NOT** be installed:
  - In contact with the soil or other potentially corrosive materials
  - Under windows or other openings that may be used as an emergency exit
  - In front of building crawl spaces
  - Near building air intakes
  - In such a manner as to create stresses upon the connecting piping and the meter

#### Installation

- Using associated pipe and fittings, install the meter and regulator
  - The combination of piping and fittings will vary from one meter set to another depending on a variety of factors. Some likely factors include: height of service riser, location of service riser in relation to customer piping and diameter of piping.
    - Verify that the insides of any piping used in the installation are clean and free of obstructions.
    - Use pipe joint material only on the male threads of the pipe being connected.
    - Tighten each fitting sufficiently to provide a gas-tight seal.
  - The meter should be installed in a manner that presents a neat appearance and is adequately supported.
  - Install the regulator ensuring that the gas flow through the regulator is in the proper direction
    - Most regulators have a marking to denote the inlet and outlet of the regulator
    - The regulator should be installed so that the regulator vent is facing downward or other configurations that will allow the regulator relief valve to function properly
      - ✓ In areas where severe water or freezing conditions may exist, consideration should be given to the installation of additional special fittings that will prevent the blocking of the regulator vent.
  - In small commercial installations, it may be necessary to install multiple meters on a meter header – the meter header shall be installed to provide adequate support of the meters and regulators.
  - Test for leaks.

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### Installation of Customer Meters & Regulators – Residential & Commercial

#### Setting Regulator Pressure (Not tied to Customer Piping)

- Once the meter(s) and regulator(s) is installed, verify the set-point of the regulator (outlet pressure setting) is correct for the application:
  - Open the outlet shut-off, if equipped, or install a fitting that will permit gas flow through the regulator.
  - Install the proper pressure gauge
  - Remove the regulator seal cap and gasket (the cap that covers the adjustment button, screw, knob)
- Turn the gas on slowly
- Verify that the reading on the pressure gauge is the correct delivery pressure – adjust as per manufacturer’s instructions.
- Turn the gas off slowly.

#### Testing of Relief Devices, If Installed

- Upon completion of the installation of the meter(s) and regulator(s), test the relief device for proper operation, if applicable.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0591 – Leak Test at Operating Pressure

1201 – Temporary Isolation of Service Lines and Service Discontinuance

1191 – Maintenance of Service Valves Upstream of Customer Meter

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Flow Rate Deviation</b> <ul style="list-style-type: none"> <li>• Unplanned Increase in Flow</li> <li>• Unplanned Decrease in Flow &amp; or No Flow</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Installing Customer Meters – Large Commercial & Industrial

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#### SCOPE AND PURPOSE

This procedure is to ensure meters are properly sized to accommodate load capacity for large commercial and industrial customers. Service is to be established in a safe and efficient manner so as to minimize anticipated stresses upon the connecting piping and the meter. It describes practices required to comply with §§192.353, 192.355, 192.357 and 192.359.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure large capacity meters are installed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Be aware of any environment that can pose a threat to personnel safety.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Meter and accessories
- Associated piping and fittings
- Routine tools
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

The meter selected should provide the customer/premise sufficient volume. All meters shall be installed and operated in accordance with the manufacturer's installation and operating instructions.

##### Meter Location (Outside)

- Wherever possible, the meter should be installed adjacent to the building being served.
- Verify that the location chosen is sufficient to protect from potential damage by forces such as:
  - Vehicles
  - Construction
  - Equipment
  - Falling objects
  - Snow and Ice
- Verify that the meter will be installed in a readily accessible location to accommodate access for:
  - Obtaining readings

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### Installing Customer Meters – Large Commercial & Industrial

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- Inspections/Testing
- Repairs
- Meter/regulator maintenance
- Operation of the gas shut-off valve
- Verify that the location will permit service regulator vents and relief vents terminate outdoors, and that the outdoor terminal is:
  - Rain and insect resistant
  - Located at a place where gas from the vent can escape freely into the atmosphere and away from any opening into the building
  - Protected from damage caused by submergence in areas where flooding may occur
- Verify that the meter will **NOT** be installed:
  - In contact with the soil or other potentially corrosive materials
  - Under windows or other openings that may be used as an emergency exit
  - In front of building crawl spaces
  - Near building air intakes
  - In such a manner as to create stresses upon the connecting piping and the meter

#### Installation

- Using associated pipe and fittings, install the meter
  - The combination of piping and fittings will vary from one meter set to another depending on a variety of factors. Some likely factors include: height of service riser, location of service riser in relation to customer piping and diameter of piping.
    - Verify that the insides of any piping used in the installation are clean and free of obstructions.
    - Use pipe joint material only on the male threads of the pipe being connected.
    - Tighten each fitting sufficiently to provide a gas-tight seal.
  - The meter should be installed in a manner that presents a neat appearance and is adequately supported.
  - In some commercial installations, it may be necessary to install multiple meters on a meter header – the installation of the meter header shall be installed to provide adequate support of the meters.
  - Test for leaks

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

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|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Installing Customer Meters – Large Commercial & Industrial

#### RELATED PROCEDURES

0591 – Leak Test at Operating Pressure

1181 – Installing and Maintaining Customer Pressure Regulating, Limiting, and Relief Device – Large Commercial & Industrial

1191 – Maintenance of Service Valves Upstream of Customer Meter

1201 – Temporary Isolation of Service Lines and Service Discontinuance

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Flow Rate Deviation</i></b> <ul style="list-style-type: none"> <li>• Unplanned Increase in Flow</li> <li>• Unplanned Decrease in Flow &amp; or No Flow</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 06/25/08 | Version: 2.0 |

### Installing & Maintaining Customer Pressure Regulating, Limiting, & Relief Devices – Large Commercial & Industrial

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#### SCOPE AND PURPOSE

This procedure provides personnel with activities necessary to properly install and maintain pressure regulating, limiting and relief devices for large commercial and industrial customers. It describes practices required to comply with 192.353, 192.355 and 192.357.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure pressure regulators, limiting and relief devices for large capacity customers are installed and maintained as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Be aware of any environment that can pose a threat to personnel safety.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Regulator
- Relief Device
- Associated piping and fittings
- Routine tools
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

The regulator/relief device selected should provide the customer/premise the correct pressure, sufficient volume and relief capacity.

All regulators and relief valves shall be installed and operated in accordance with the manufacturer's installation and operating instructions.

##### Regulator/Relief Valve Location (Outside)

- Wherever possible, the regulator/relief valve should be installed adjacent to the building being served.
- Verify that the location chosen is sufficient to protect from potential damage by forces such as:
  - Vehicles
  - Construction

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### Installing & Maintaining Customer Pressure Regulating, Limiting, & Relief Devices – Large Commercial & Industrial

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- Equipment
- Falling objects
- Snow and Ice
- Verify that the regulator/relief valve will be installed in a readily accessible location to accommodate access for:
  - Obtaining readings
  - Inspections/Testing
  - Repairs
  - Meter/regulator maintenance
  - Operation of the gas shut-off valve
- Verify that the location will permit service regulator vents and relief vents terminate outdoors, and that outdoor terminal is:
  - Rain and insect resistant
  - Located at a place where gas from the vent can escape freely into the atmosphere and way from any opening into the building
  - Protected from damage caused by submergence in areas where flooding may occur
- Verify that the regulator/relief valve will **NOT** be installed:
  - In contact with the soil or other potentially corrosive materials
  - Under windows or other openings that may be used as an emergency exit
  - In front of building crawl spaces
  - Near building air intakes
  - In such a manner as to create stresses upon the connecting piping and the regulator/relief valve

#### Installation

- Using associated pipe and fittings, install the regulator/relief valve
  - The combination of piping and fittings will vary from one regulator/relief valve to another depending on a variety of factors. Some likely factors include: height of service riser, location of service riser in relation to customer piping and diameter of piping.
    - Verify that the insides of any piping used in the installation are clean and free of obstructions.
    - Use pipe joint material only on the male threads of the pipe being connected.
    - Tighten each fitting sufficiently to provide a gas-tight seal.
  - The regulator/relief valve should be installed in a manner that presents a neat appearance and is adequately supported.
  - Test for leaks.

#### Setting Regulator Pressure (Not tied to Customer Piping)

- Once the meter(s) and regulator(s) is installed, verify the set-point of the regulator (outlet pressure setting) is correct for the application:
  - Open the outlet shut-off, if equipped, or install a fitting that will permit gas flow through the regulator.
  - Install the proper pressure gauge

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### Installing & Maintaining Customer Pressure Regulating, Limiting, & Relief Devices – Large Commercial & Industrial

- Remove the regulator seal cap and gasket (the cap that covers the adjustment button, screw, knob)
- Turn the gas on slowly
- Verify that the reading on the pressure gauge is the correct delivery pressure – adjust as per manufacturer’s instructions.
- Turn the gas off slowly.

#### Testing of Relief Devices, If Installed

- Testing of relief devices shall be done in accordance with the related procedure 0381,0391,0411,0421 – Regulator Station Inspection & Testing

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### RELATED PROCEDURES

0591 – Leak Test at Operating Pressure

1171 – Installing Customer Meters-Large Commercial and Industrial

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>● Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>● Inoperable/Failure of a Pipeline Component</li> <li>● Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>● Low odorization</li> <li>● Over odorization</li> <li>● Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>● Improper fitting/component installation</li> <li>● Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| <b>B31Q Task #1191</b>  | Page 1 of 3  |
| Revision date: 08/26/08 | Version: 2.0 |

### Maintenance of Service Valves Upstream of Customer Meter

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#### SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to ensure the integrity of the piping system when removing and replacing service valves. It includes the performance of maintenance, if applicable.

It describes practices required to comply with §192.365.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that maintenance of service valves is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Routine Work Tools
  - Leak Detect Equipment
  - Grease Gun and Lubricant (If Needed)
  - Valve Changer (If Utilized)
- Hand Tools
- Other Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.

##### General

- While approaching the service valve, visually examine the area for signs of conditions that may interfere with proper access.
- Perform a visual check ensuring service valve is installed upstream of the customer meter, conveniently accessible and sufficient space exists to accommodate valve operation without interference.
- Inspect service valve to determine if it is leaking.
  - If found to be leaking at threads, securely tighten service valve to associated piping and re-check for leaks.

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### Maintenance of Service Valves Upstream of Customer Meter

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- If found to be leaking at body of valve, and valve is equipped with grease plug, apply lubricant and re-check for leaks. Care should be taken to not introduce excessive amounts of lubricant.
- If found to be leaking at body of valve, and valve is not equipped with grease plug, remove and replace valve.

#### **Valve Changer Method**

- a. Select the proper plugging unit for the size service valve to be removed.
- b. Close service valve; bleed gas from piping at outlet end.
- c. Remove enough associated piping and fittings from the outlet end of the service valve for easy installation of valve changer.
- d. Lubricate rubber plug with soap solution then withdraw to rearmost position into the stuffing box.
- e. Screw stuffing box into outlet of the service valve, close bleeder valve then fully open service valve. Safety clamp should be attached to the pipe.
- f. Insert rubber plug into service valve then expand the plug by turning shaft crank until shut off is made.
- g. Open bleeder valve to release gas from the stuffing box and service valve. At this point, the tightness of the shut off will be indicated. If flow continues from the bleeder valve, shut off was not complete. Close bleeder valve and slowly rotate shaft crank for additional expansion of rubber plug. Open bleeder valve to test for shut off.
- h. Once shut off is accomplished, unscrew the service valve from the pipe and slide both the stuffing box and service valve along the shaft tube for removal. Remove the stuffing box from the service valve.
- i. Screw stuffing box into the outlet end of the new service valve (ensure the valve is fully open) then slide the service valve and stuffing box over the end of the shaft tube. After applying pipe dope to the threads of the pipe, screw and tighten the service valve onto the end of the pipe.
- j. Close the bleeder valve and rotate shaft crank counter clockwise relaxing the rubber plug. Slowly slide the shaft tube so that the rubber plug passes through the service valve and fully into the stuffing box.
- k. Close the service valve, open bleeder valve to release gas from the stuffing box and remove equipment.
- l. Reconnect outlet associated piping and fittings.

#### **Shut Off Method**

- a. Before removing and replacing service valves, shutting off gas can be made at the service tap or farm tap regulator.

#### **Squeeze Off Method**

- a. Plastic pipe can be squeezed, shutting off gas flow. Verify correct pipeline segment and proper location for the squeeze. Select and utilize proper squeeze tool operating in accordance with the manufacturer's instructions.

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### Maintenance of Service Valves Upstream of Customer Meter

#### “Live” Change out Method

- In certain situations, the practice of performing a service valve change out “live” may be carried out with extreme care and caution. Operating pressure must be within appropriate limits, personnel must use suitable personal protective equipment and conditions must be safe for the public and personnel performing this activity.
- a. Remove enough associated piping and fittings from the outlet end of the service valve for easy removal and replacement.
- b. Use appropriate tool to unscrew service valve from pipe.
- c. Apply pipe dope to threads of pipe then screw and securely tighten replacement service valve to pipe. Make sure the valve is in the open position so that less force is needed for attachment.
- d. Once service valve is attached to pipe, close the wrench tab shutting off gas flow.
- e. Reassemble and sufficiently tighten associated piping and fittings. Verify gas tight seal using soap solution.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

0301 – Manually Opening and Closing Valves

0331 – Valve-Visual Inspection & Partial Operation

0341 – Valve Preventative Maintenance

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | Reactions to AOC, as appropriate  |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Flow Rate Deviation</b> <ul style="list-style-type: none"> <li>• Unplanned Increase in Flow</li> <li>• Unplanned Decrease in Flow &amp; or No Flow</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Temporary Isolation of Service Lines and Service Discontinuance

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#### SCOPE AND PURPOSE

This procedure is to ensure that temporary isolation of service lines and service discontinuance are performed safely as required by §192.727.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that temporary isolation of service lines and service discontinuance are performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Meter valve lock, barrel lock or similar stopping devices
- Equipment and Materials as Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to temporarily isolate service lines and discontinue service. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Temporarily Isolating a Service

Temporary isolation means that service to a customer will be discontinued for a short period to allow maintenance or other activity to be performed on the service line and/or meter set assembly -- service to the customer will be restored when the work is completed.

##### Step 1: Stop the Flow of Gas

For work downstream of the meter valve, close the meter valve. If for any reason you must leave the worksite, lock the meter valve closed.

For work between the main and the meter valve:

- If there is a curb valve on the service, close the curb valve.  
If there is no curb valve, excavate to expose the service line connection to the main. Note: Any buried piping that is exposed must be inspected following Procedure 0151-0201-0641 – Visual Inspections of Pipe and Components
- If there is a gas control fitting, e.g., a self-tapping tee, remove the cap, insert the proper tool and turn it clockwise. Seat the tapping bit firmly inside the tap hole to stop gas flow.
- For plastic pipe, gas flow may be stopped by following Procedure 1141 -- Squeeze Off Plastic Pipe
- On a metal line with no curb valve or gas control fitting, stop gas using one of these Procedures:
  - 1131 -- Stopper (Stoppie) Pipe
  - 1151 -- Squeeze Off Steel Pipe

##### Step 2: Purge Gas From the Service Line



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### Temporary Isolation of Service Lines and Service Discontinuance

This is only required if work is being done between the main and the meter valve. Refer to Procedure 1641-1651 Purging for purging procedures and safety requirements.

#### Step 3: Complete Work and Reconnect Service Line or Meter Assembly

If the service line was purged of gas, purge the air from the line using gas:

1. Close the meter valve
2. Disconnect the piping from the outlet of the meter valve
3. Re-open whatever method was used to isolate the service from the main.
4. Follow purging safety precautions, open the meter valve, fully open if there is not an excess flow valve (EFV) installed on the service, less than fully open so as not to trip the EFV if one is installed.
5. Close the meter valve when 100% gas is detected.
6. Reconnect the meter assembly

#### **Discontinuing Service**

Discontinuing service means that service to the customer will be stopped for an indefinite period of time -- if and when service to the customer will be resumed is not known. Whenever service to a customer is to be discontinued one of the following must be done:

- lock or otherwise secure the valve controlling gas to the service, or
- install a mechanical device or fitting in the service line or meter set, or
- disconnect the customer's piping from the gas supply.

#### **REPORTING/NOTIFICATION**

Complete documentation in accordance with Operations and Maintenance Manual.

#### **RELATED PROCEDURES**

- 0641 – Visually Inspect Pipe and Components Prior to Installation
- 1131 -- Stopper (Stoppie) Pipe
- 1141 -- Squeeze Off Plastic Pipe
- 1151 -- Squeeze Off Steel Pipe
- 1641-1651 Purging with Gas, Air, or Inert Gas
- 1661 -- Isolating Abandoning and Deactivating Pipeline Facilities

#### **ABNORMAL OPERATING CONDITIONS**

| <b>AOC Main Category</b> & Examples of Specific AOCs   | Reactions to AOC, as appropriate  |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 09/06/13 | Version: 2.2 |

### Odorization – Periodic Sampling

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#### SCOPE AND PURPOSE

This procedure is to ensure that the gas in the pipeline is readily detectable by a person with a normal sense of smell. It describes odorization sampling practices required to comply with §192.625.

#### RESPONSIBILITY

City of Thomasville, Gas Superintendent, or other designee, is responsible to ensure that Odorization sampling is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

- Do not perform odorization sampling if lightning is present.
- During use, odorization sampling equipment should be kept away from open flames.
- Do not exceed manufacturer's recommended maximum inlet supply pressure.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Odorization sampling equipment
- Necessary tools for connection to a gas stream
- Leak Detector Equipment
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform periodic odorization sampling. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Maintenance and Operating Instructions

Each instrument used for periodic odorization sampling shall be operated and maintained in accordance with the manufacturer's recommended operating instructions.

##### Calibration of Instruments

Each instrument used for periodic odorization sampling shall be calibrated in accordance with the manufacturer's recommended calibration instructions.

##### Odorization Sampling using Odorometer

- When possible, odorization sampling should be performed in an odor and draft free environment.
- Odorization sampling must be performed by a person with a normal sense of smell.
- Connect the instrument to the gas supply
  - **Do not exceed the manufacturer's maximum recommended inlet supply pressure**
- Obtain reading according to the manufacturer's instructions.
- The lower explosive limit (L.E.L) of natural gas is 5%. The odorant shall be readily detectable at 1/5<sup>th</sup> L.E.L – if the odorant is not readily detectable at 1/5<sup>th</sup> L.E.L (1%) steps shall be taken in accordance with the operations and maintenance manual.

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### Odorization – Periodic Sampling

#### Odorization Sampling using Sniff Test (Master Meter Operators)

- Obtain written verification from gas supplier that the gas has the proper concentration of odorant; and
- Conduct periodic “sniff” tests at the extremities of the system to confirm that the gas contains adequate odorant.
  - Must be performed by a person with a normal sense of smell.
  - Release a small amount of gas in a controlled manner for a short duration
  - Determine whether odorant is detectible.
  - If the odorant is not readily detectable, notify the gas supplier.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

None

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>        | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 06/25/08 | Version: 2.0 |

### Odorization - Odorizer Inspection, Testing, Preventive and Corrective Maintenance

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#### SCOPE AND PURPOSE

This procedure is to ensure continuous, reliable operation of odorizers.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that odorizer inspection, testing and maintenance is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Odorants are about as flammable as gasoline and should be handled with care.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Odorometer
- Leak Detector Equipment
- Odorizer manufacturer's User's Manual
- Records from the previous inspection
- Odorant
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform periodic odorizer inspection, testing, preventive and corrective maintenance. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### Handling Odorants

The following precautions should be taken when handling odorants:

- Avoid breathing vapor,
- Keep away from heat and sources of ignition,
- Provide adequate ventilation,
- Avoid contact with eyes or skin,
- Wear goggles and nonpermeable gloves, such as PVC or nitrile rubber. (Odorants can penetrate vinyl gloves.),
- Clothing may absorb odorant. It may be advisable to change clothes before leaving the work area. Also, note that odorants can be adsorbed by leather and metal: e.g., belts, belt buckles and coins,
- Emptied containers may contain hazardous residues. **DO NOT CUT OR GRIND ON THE CONTAINER,**
- Dispose of empty containers properly
- Provide metallic containers with electrical grounding.

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### Odorization - Odorizer Inspection, Testing, Preventive and Corrective Maintenance

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#### Handling Odorant Spills

Odorant spills require immediate response. Since the spreading of odor is the result of vaporization of the liquid odorant, methods should be used to decrease the vapor escape. Minor drippings can be treated with bleach solutions to react with the odorant to produce less odiferous compounds or absorbed with soil or sand and removed to a closed container for approved and controlled disposal. Do not use dry or powdered bleach.

Large spills should be contained immediately. The contaminated area should be diked and/or connected to a sump from which the spilled material can be transferred to a closed container. Personnel should stay upwind and wear air-supplied masks or self-contained breathing apparatus. Do not use bleach solutions on large spills as the liquids will drive the odorant deeper into the soil and increase the contaminated area. Reaction between a large quantity of bleach with a large odorant spill may also cause the spilled odorant to heat up sufficiently to start a fire or injure personnel responding to the spill.

Further information on odorant safety is available on the Material Data Safety Sheet for the specific odorant in use.

#### Inspection and Maintenance

In preparation for an odorizer inspection the following information should be obtained:

- Total volume of gas, in MCF, that passed through the odorization facility since the previous inspection
- The odorant storage tank level from the previous inspection
- Amount of odorant added since the previous inspection

#### Inspection of Odorizers

- Check the odorant tank for adequate supply. Add odorant if necessary
- Read and record the odorant tank level
- Inspect all odorizer components and piping for gas and/or odorant leaks making repairs if leaks are found
- Inspect odorizer for proper operation following manufacturer's instructions
- If adjustments are necessary, record odorizer settings as left
- Record all maintenance and repairs performed

#### Verifying Odorant Rate

Determine the amount of odorant used, in pounds:

Odorant used = lbs of odorant remaining at this inspection minus lbs of odorant remaining at the previous inspection plus lbs of odorant added since previous inspection.

If odorant measurements are in gallons, multiply by 6.8 to convert gallons to pounds [NOTE: This is an approximate conversion – check the specifications for the density in lbs/gallon for the specific odorant you are using].

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### Odorization - Odorizer Inspection, Testing, Preventive and Corrective Maintenance

If the odorant storage tank measurement are in inches check the manufacturer's literature for the odorizer's specific conversion factor from inches to pounds or gallons.

Calculate the odorization rate by dividing the pounds of odorant used by the MCF of gas that passed through the odorizer since the previous inspection.

Odorization level should be established by the user of this procedure based on the recommendations of the odorant manufacturer and the results of periodic sampling of odorant under Procedure 1211.

Conduct an odor test according to Procedure 1211 to verify that odorant can be readily detected in the gas leaving the odorization facility.

#### Preventive and Corrective Maintenance

Follow the odorizer manufacturer's instructions for preventive and corrective maintenance

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

1211 -- Odorization-Periodic Sampling

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>Protect life &amp; Property</li> <li>Prevent accidental ignition</li> <li>Notify appropriate personnel</li> <li>Notify Fire/Emergency Responders</li> <li>Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Use appropriate PPE</li> <li>Stop gas flow</li> <li>Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Flow Rate Deviation</b> <ul style="list-style-type: none"> <li>Unplanned Increase in Flow</li> <li>Unplanned Decrease in Flow &amp; or No Flow</li> </ul>            | <ul style="list-style-type: none"> <li>Protect life &amp; property</li> <li>Notify appropriate personnel</li> <li>Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>Protect life &amp; property</li> <li>Notify appropriate personnel</li> <li>Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization</li> <li>Odor complaint</li> </ul>          | <ul style="list-style-type: none"> <li>Protect life &amp; property</li> <li>Prevent accidental ignition</li> <li>Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 06/27/16 | Version: 2.2 |

### Leak Investigation – Inside Gas Leak Investigation

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#### SCOPE AND PURPOSE

This procedure is to provide personnel performing inside leak investigations with the necessary procedures for prompt and effective response and to protect life and property as required by §192.615.

#### RESPONSIBILITY

The [City of Thomasville Gas Superintendent](#), or other designee, is responsible to ensure that inside leak investigations are performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

- The first person to respond to a report of gas detected inside a building shall take every necessary action to **protect life and property**.
- No open flames.
- No smoking
- Ensure that cell phones, pagers, and radios are either intrinsically safe or left outside.
- Turn on all necessary equipment before entering premise (Flashlights, Combustible Gas Indicators (CGI), etc.) – “Zero” CGI in clean air before taking readings.
- **Knock** on the door – **DO NOT** ring the doorbell.
- DO NOT use the telephone in the area of a suspected gas leak.
- Use of the required safety equipment
- Establish a safety perimeter to prevent bystanders and unauthorized personnel from entering the area. It is the judgement of the personnel at the scene when determining the parameters of a safety perimeter. In addition to the judgement of the personnel at the scene, additional considerations for establishing a safety perimeter around a leak or suspected leak include, but are not limited to:
  - Migration of the leak
    - Personnel should be aware of the possibility that the leak or suspected leak has migrated into adjacent structures such as:
      - Buildings
      - Catch Basins/Storm Drains
      - Water meter boxes
      - Manholes
      - Utility ducts and manholes
      - Other small substructures
    - Personnel should also be aware of the following factors that may affect gas migration:
      - Soil type and moisture
      - The type of surface conditions covering the gas line(s)
      - Line pressure
      - Depth of the gas facilities
      - The size of the leak and the length of time it has been leaking
      - Changes in slope where the facilities are buried
      - Natural gas will take the path of least resistance
  - Wind direction
- Potential ignition sources

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| Prepared by: | Approved by: | Date: |
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### Leak Investigation – Inside Gas Leak Investigation

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#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Gas Detector Equipment
- Combustible Gas Indicator (CGI)
- Communication method (Radio, Cell Phone, etc)
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform inside leak investigations. Refer to the OQ Plan for specific qualification requirements.

#### MAINTENANCE & OPERATION OF INSTRUMENTS

Each instrument used for leak detection and evaluation shall be operated in accordance with the manufacturer's recommended operating instructions.

#### CALIBRATION OF INSTRUMENTS

Each instrument used for leak detection and evaluation shall be calibrated at the following times in accordance with the manufacturer's recommend calibration instructions.

#### INSTRUCTIONS

##### 1. **Customer Not at Home**

###### a. Attempt to determine the condition inside the building.

- While approaching the building, observe the area for obvious signs of a gas leak in the area (use sight, smell, and hearing), including, but not limited to:
  - Dead or dying grass, shrubs, or trees
  - Absence of growth in paving cracks
  - Cracked or crusted soil, or mildewed soil
  - Absence of grass overhang on curbing or walkways
  - Odor of gas or sound of escaping gas
- Using an instrument capable of alerting the user to the presence of a gas leak, check around the entrance door and any other available openings such as, but not limited to, crawl space vents, windows, etc. for an indication of a gas leak.
- Probe around the outside perimeter of the building next to the building foundation and obtain CGI readings checking for the presence of gas in the ground outside the building.
  - If the presence of gas is detected in the ground and there is no indication of gas inside the building, see **B31Q Task # 1241 – Outside Leak Investigation**.

###### b. If there is an indication of gas inside the building:

- Shut off the gas to the building, if one exists.
- If, in the judgment of the personnel at the scene, the indication of gas presents a hazard to life or property, immediately notify:
  - System Management
  - Fire Department
  - Police Department

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### Leak Investigation – Inside Gas Leak Investigation

- iii. Establish a safety perimeter and prevent unauthorized personnel from entering the building – DO NOT allow entry into the building until it has been checked and deemed safe for entry.
- iv. Conduct a check of adjacent structures for the presence of a gas leak.
- v. If necessary, implement Emergency Plan.

#### 2. Customer at Home

##### a. Assess the condition inside the building.

- i. While approaching the building, observe the area for obvious signs of a gas leak in the area (use sight, smell, and hearing).
- ii. Ensure that all equipment is turned on prior to entering the building (Flashlight, CGI, Gas Detector, etc.) and ensure that all cell phones, pagers, and radios are intrinsically safe or left outside.
- iii. Using an instrument capable of alerting the user to the presence of a gas leak, check around the entrance door for the presence of a gas leak.
- iv. Question occupants regarding the location of the gas odor.
- v. As you enter the premise, sample the air in rooms, concentrating on the location(s) where the occupants believe they detected the odor, if given, for the presence of a gas leak.
- vi. Sample air in basements or crawl space for the presence of a gas leak.

##### b. If there is an indication of gas inside the building:

- i. Obtain a reading with a CGI. If the reading indicates the presence of a dangerous concentration of gas (20% of the Lower Explosive Limit (L.E.L.) or 1% on the percent gas (%) scale, or greater, or in the judgment of the personnel at the scene the indication of gas presents a hazard to life or property:
  - Evacuate the building immediately;
  - **DO NOT** operate/use any electrical switches;
  - Leave the door open as you exit;
  - Shut off and lock gas meter, if one exists;
  - Notify immediate Supervisor
  - Establish a safety perimeter and prevent unauthorized personnel from entering the building – DO NOT allow entry into the building until it has been checked and deemed safe for entry.
  - Probe around the outside perimeter of the building next to the building foundation and obtain CGI readings checking for the presence of gas in the ground outside the building.
    - Check water meter boxes and other available openings. Check other structures in close proximity.
    - If the presence of gas is detected in the ground, see **B31Q Task # 1241 – Outside Leak Investigation**.
- ii. If necessary, implement Emergency Plan.
- iii. Once the building is safe for re-entry:
  - Search for and locate leak.
  - Repair leak or inform the customer to correct the situation – if the repair is the customer’s responsibility, ensure meter is off and locked – advice the customer to call back to have the gas turned back on once the repair is made.

##### c. If there is an indication of gas inside the building and it DOES NOT present a hazard to life or property (see 2.b.i. above), and a shut-off valve is located before the leak:

- i. Shut off the valve at the appliance/leak to isolate the leak and tag the appliance; or,
- ii. Repair leak; or

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### Leak Investigation – Inside Gas Leak Investigation

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- iii.* Turn off service valve at the meter, install lock in the service valve, and advise the customer to repair.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operations and Maintenance Manual.

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### Leak Investigation – Inside Gas Leak Investigation

#### RELATED PROCEDURES

- 1241 – Outside Gas Leak Investigation
- 1261 – Walking Gas Leakage Survey

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Pressure Deviation</b> <ul style="list-style-type: none"> <li>• Unplanned Decrease in Pressure &amp; or No Press.</li> <li>• Unplanned Increase in Pressure</li> </ul>                | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Flow Rate Deviation</b> <ul style="list-style-type: none"> <li>• Unplanned Increase in Flow</li> <li>• Unplanned Decrease in Flow &amp; or No Flow</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization &amp; or Odor complaint</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Outside Gas Leak Investigation

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#### SCOPE AND PURPOSE

This procedure is to provide personnel performing outside leak investigations with the necessary procedures for prompt and effective response and to protect life and property as required by §192.615.

#### RESPONSIBILITY

The [City of Thomasville Gas Superintendent](#), or other designee, is responsible to ensure that outside leak investigations are performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

- The first person to respond to a report of gas odor shall take every necessary action to ***protect life and property***.
- No open flames.
- No smoking.
- Use of the required safety equipment
- Establish a safety perimeter to prevent bystanders and unauthorized personnel from entering the area. It is the judgement of the personnel at the scene when determining the parameters of a safety perimeter. In addition to the judgement of the personnel at the scene, additional considerations for establishing a safety perimeter around a leak or suspected leak include, but are not limited to:
  - Migration of the leak
    - Personnel should be aware of the possibility that the leak or suspected leak has migrated into adjacent structures such as:
      - Buildings
      - Catch Basins/Storm Drains
      - Water meter boxes
      - Manholes
      - Utility ducts and manholes
      - Other small substructures
    - Personnel should also be aware of the following factors that may affect gas migration:
      - Soil type and moisture
      - The type of surface conditions covering the gas line(s)
      - Line pressure
      - Depth of the gas facilities
      - The size of the leak and the length of time it has been leaking
      - Changes in slope where the facilities are buried
      - Natural gas will take the path of least resistance
  - Wind direction
- Potential ignition sources

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Gas Detector Equipment
- Combustible Gas Indicator (CGI)

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### Outside Gas Leak Investigation

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- Probe Rod
- Maps & Other Records (If Available)
- Communication method (Radio, Cell Phone, etc)
- Other Equipment and Materials as Needed

#### **OPERATOR QUALIFICATION**

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform outside leak investigations. Refer to the OQ Plan for specific qualification requirements.

#### **MAINTENANCE & OPERATION OF INSTRUMENTS**

Each instrument used for leak detection and evaluation shall be operated in accordance with the manufacturer's recommended operating instructions.

#### **CALIBRATION OF INSTRUMENTS**

Each instrument used for leak detection and evaluation shall be calibrated at the following times in accordance with the manufacturer's recommended calibration instructions.

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### Outside Gas Leak Investigation

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#### ADDITIONAL GUIDANCE & ACTION CRITERIA

When performing outside leak investigations, or when evaluating any gas leak indication, the initial step is to determine if a leak is present, and then establish the grade/severity and perimeter of the leak area considering the following:

- If possible, locate all gas lines in the vicinity of the leak investigation. Particular attention should be paid to the location of valves, fittings, tees, stubs, and connections.
  - If possible, all foreign facilities in the area of the search should be identified.
  - Personnel should look for evidence of recent construction activities that may have contributed to the leakage.
  - Gas may also migrate and vent along a trench or bore-hole provided for other facilities. Leaks could occur at the intersection of the foreign facility and the gas pipeline; particular attention should be given to those intersections.
  - If possible, CGI readings should be taken in, or adjacent to, water, sewer, storm water, electric, and telephone structures such as water meter boxes, manholes, catch basins, sewer clean-outs, and junction boxes in the area of the suspected leak, if applicable.
  - Evenly spaced bar or test holes should be used over the gas line(s) suspected to be leaking.
  - If possible, all bar or test holes should be of equal depth and diameter (and down to the pipe where necessary).
  - If possible, all CGI readings should be taken at an equal depth and the readings recorded.
1. Before a leak can be classified, a determination shall be made as to the severity of the leak.
    - The migration of gas shall be determined by establishing the outer boundaries of the indications. These tests shall be made with a CGI.
  2. Based on the evaluation of the location or magnitude of a leak, or both, leaks shall then be graded in accordance with the [City of Thomasville](#) leak classification criteria. The judgment of the personnel at the scene is of the primary importance in determining the grade assigned to the leak.
    - **Note: Underground leaks must be graded using a Combustible Gas Indicator (CGI). A CGI is a device capable of detecting and measuring gas concentrations, of the gas being transported, in the atmosphere.**
  3. All leaks shall be repaired / monitored according to the [City of Thomasville](#) leak classification and action criteria.
  4. When a leak is to be re-evaluated **or downgraded**, it shall be re-evaluated/**downgraded** and classified using the same procedure that was used in the initial classification of the leak.

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### Outside Gas Leak Investigation

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#### INSTRUCTIONS

- a. While approaching the area of a suspected outside gas leak, observe the area for obvious signs of a gas leak in the area (use sight, smell, and hearing), including, but not limited to:
  - Dead or dying grass, shrubs, or trees
  - Absence of growth in paving cracks
  - Cracked or crusted soil, or mildewed soil
  - Absence of grass overhang on curbing or walkways
  - Odor of gas or sound of escaping gas
- b. Interview the individual(s) that reported the odor, if they are available. Begin the leak investigation in the area where the individual(s) reported the leak, if given.
- c. Check any aboveground facilities for leaks, such as, but not limited to, meter sets and regulator stations.
- d. Check around the perimeter of any structure in which gas could likely migrate along the edge of the foundation for the presence of a gas leak, if applicable.
- e. Perform underground leak investigations of any underground mains and services in the area.
- f. If using an instrument capable of alerting the user of the presence of a gas leak and this instrument indicates the presence of a gas leak, verify that gas is not migrating close to any buildings or other structures where gas could likely accumulate.
- g. Begin probing (“bar-holing”) around the perimeter of any structure in which the gas could likely migrate along the edge of the foundation and obtain readings using a CGI (Refer to your company’s leak grading standards for the grading of leaks).
  - **Note: Only those instruments designed to register the % of gas-in-air may be used for grading leaks. Instruments that give audible or visual alarms for gas leaks but do not provide % of gas-in-air may not be used for grading leaks.**
- h. If a check of the outside of a building or other structure indicates the presence of gas near or under a building or other structure or along the edge of the foundation:
  - i. Notify in accordance with Operations and Maintenance Manual or Emergency Plan; and
  - ii. Begin taking action as described in **B31Q Task # 1231 – Inside Leak Investigation.**
  - iii. If possible, expose the area around the service riser, open water meter boxes and other available openings to allow the gas to escape to the atmosphere. Care must be taken to make these openings safe for the public and to AVOID IGNITION.
- i. Consideration should also be given to probing (“bar-holing”) along nearby neighboring structures especially if the leak investigation is revealing no presence of a gas leak at the present location.

#### Precautions

- When placing bar or test holes for testing, consideration shall be given to bar or test-hole placement and depth to minimize the potential for damage to gas pipeline facilities and possible injury to personnel conducting the investigation.
- Caution should also be exercised to prevent damage to other underground structures when barholing or excavating.
- Unusual situations may complicate investigation techniques on some occasions such as, but not limited to:
  - Multiple leaks
  - Foreign gases

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### Outside Gas Leak Investigation

- Gas detected in storm-drain or sewer systems
- Gas detected in telephone or other duct runs
  - These indications should be considered migrating gas leakage until proven otherwise by test or analysis.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operations and Maintenance Manual.

#### RELATED PROCEDURES

- 1231 – Inside Gas Leak Investigation
- 1261 – Walking Gas Leakage Survey

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Unplanned Pressure Deviation</i></b> <ul style="list-style-type: none"> <li>• Unplanned Decrease in Pressure &amp; or No Press.</li> <li>• Unplanned Increase in Pressure</li> </ul>                | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Flow Rate Deviation</i></b> <ul style="list-style-type: none"> <li>• Unplanned Increase in Flow</li> <li>• Unplanned Decrease in Flow &amp; or No Flow</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization &amp; or Odor complaint</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Walking Gas Leakage Survey

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#### SCOPE AND PURPOSE

This procedure is to provide personnel performing leakage surveys with the necessary procedures to inspect any portion of a natural gas system to detect, classify, and report leakage locations that are venting to the atmosphere as required by §192.706 & §192.723.

A leakage survey shall provide coverage of mains and services underground and aboveground; in all areas where an operator can reasonably be expected to carry the equipment.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that leakage surveys are properly performed.

#### PERSONNEL SAFETY (Where Applicable)

Do not survey if lightning is present.

Leakage surveys may be conducted by using either a single- or multiple-person survey party.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Gas Detector
- Probe Rod
- Combustible Gas Indicator (CGI)
- Maps & Other Records (If Available)
- Communication method (Radio, Cell Phone, etc)
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform surface leakage surveys utilizing the walking method. Refer to the OQ Plan for specific qualification requirements.

#### MAINTENANCE & OPERATION OF INSTRUMENTS

Each instrument used for leak detection and evaluation shall be operated in accordance with the manufacturer's recommended operating instructions.

#### CALIBRATION OF INSTRUMENTS

Each instrument used for leak detection and evaluation shall be calibrated at the following times in accordance with the manufacturer's recommended calibration instructions.

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### Walking Gas Leakage Survey

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#### INSTRUCTIONS

The survey shall be conducted at speeds slow enough to allow an adequate sample to be continuously obtained by placement of equipment intakes over the most logical venting locations (See 1, 2, 3 below), giving consideration to the location of gas facilities.

1. For Aboveground Piping:

- Sampling of the atmosphere should, where practical, take place adjacent to the piping as close as permitted by gas detector design, due to the potential for rapid diffusion of leaking gas to the atmosphere.

2. For Underground Piping:

- Sampling of the atmosphere should, where practical, take place along the route of the pipeline to be inspected as close to the ground surface as permitted by gas detector design, due to the potential for rapid diffusion of leaking gas to the atmosphere.

3. Areas Where Piping is Under Pavement

- Samplings should be taken at, but not limited to, the following locations:
  - Curb Line(s)
  - Available ground surface openings, such as but not limited to:
    - Manholes
    - Catch Basins
    - Sewer, Power, & Telephone Duct Openings
    - Fire & Traffic Signal Boxes
    - Cracks in Pavement of Sidewalks
    - Any Point where Venting is Likely to Occur
- Foundation Walls

4. Limitations

- Gas detector design or adverse conditions may **limit** the use of this survey method. Examples of adverse conditions that may affect the venting of subsurface gas leaks include, but are not limited to:
  - Moisture
  - Frost
  - Ice & Snow Cover
  - High or Gusting Wind

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### Walking Gas Leakage Survey

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#### Leak Classification, & Action Criteria

When evaluating any gas leak indication, the initial step is to determine the grade/severity and perimeter of the leak area and take appropriate action in accordance with Operations and Maintenance Manual or Emergency Plan. If this perimeter extends to a building wall, the investigation(s) should continue into the building, if possible.

1. Before a leak can be classified, a determination shall be made as to the severity of the leak.
  - The migration of gas shall be determined by establishing the outer boundaries of the indications. These tests shall be made with a CGI.
  - If possible, locate all gas lines in the vicinity of the leak indication. Particular attention should be paid to the location of valves, fittings, tees, stubs, and connections.
  - If possible, all foreign facilities in the area of the search should be identified.
  - Personnel should look for evidence of recent construction activities that may have contributed to the leakage.
  - Gas may also migrate and vent along a trench or bore-hole provided for other facilities. Leaks could occur at the intersection of the foreign facility and the gas pipeline; particular attention should be given to those intersections.
  - Evenly spaced bar or test holes should be used over the gas line(s) suspected to be leaking.
  - If possible, all bar or test holes should be of equal depth and diameter (and down to the pipe where necessary).
  - All CGI readings should be taken at an equal depth and the readings recorded.
2. Based on the evaluation of the location or magnitude of a leak, or both, leaks shall then be graded in accordance with the [City of Thomasville's](#) leak classification criteria. The judgment of the personnel at the scene is of the primary importance in determining the grade assigned to the leak.
  - **Note: Underground leaks must be graded using a Combustible Gas Indicator (CGI). A CGI is a device capable of detecting and measuring gas concentrations, of the gas being transported, in the atmosphere.**
3. All leaks shall be repaired / monitored according to the [City of Thomasville's](#) leak classification and action criteria.
4. When a leak is to be re-evaluated, it shall be re-evaluated and classified using the same procedure that was used in the initial classification of the leak.

#### Precautions

- When placing bar or test holes for testing, consideration shall be given to bar or test-hole placement and depth to minimize the potential for damage to gas pipeline facilities and possible injury to personnel conducting the investigation.
- Caution should also be exercised to prevent damage to other underground structures when barholing or excavating.
- Unusual situations may complicate investigation techniques on some occasions such as, but not limited to:
  - Multiple leaks
  - Foreign gases
  - Gas detected in storm-drain or sewer systems
  - Gas detected in telephone or other duct runs

|                   |                              |               |
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| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

|                           |              |
|---------------------------|--------------|
| <b>B31Q Task # - 1261</b> | Page 4 of 4  |
| Revision date: 4/14/08    | Version: 2.1 |

### Walking Gas Leakage Survey

- These indications should be considered migrating gas leakage until proven otherwise by test or analysis.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operations and Maintenance Manual.

#### RELATED PROCEDURES

- 1231 – Inside Gas Leak Investigation
- 1241 – Outside Gas Leak Investigation

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Pressure Deviation</b> <ul style="list-style-type: none"> <li>Unplanned Decrease in Pressure &amp; or No Press.</li> <li>Unplanned Increase in Pressure</li> </ul>                | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Flow Rate Deviation</b> <ul style="list-style-type: none"> <li>Unplanned Increase in Flow</li> <li>Unplanned Decrease in Flow &amp; or No Flow</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization &amp; or Odor complaint</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>Improper fitting/component installation</li> <li>Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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| Revision date: July 10, 2009 | Version: 2.5 |

### Propane Walking Gas Leakage Survey

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#### SCOPE AND PURPOSE

This procedure is to provide personnel performing leakage surveys on propane systems with the necessary procedures to inspect any portion of a propane gas system to detect, classify, and report leakage locations as required by §192.723.

A leakage survey shall provide coverage of mains and services underground and aboveground; in all areas where an operator can reasonably be expected to carry the equipment.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that leakage surveys are properly performed.

#### PERSONNEL SAFETY (Where Applicable)

Do not survey if lightning is present.

Leakage surveys may be conducted by using either a single- or multiple-person survey party.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Probe Rod
- Combustible Gas Indicator (CGI) Calibrated for Propane; or
- Combustible Gas Indicator (CGI) Calibrated for Natural Gas (Conversion curves are needed – See the “Calibration of Instruments” section of this procedure)
- Maps & Other Records (If Available)
- Communication method (Radio, Cell Phone, etc)
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform surface leakage surveys utilizing the walking method. Refer to the OQ Plan for specific qualification requirements.

#### MAINTENANCE & OPERATION OF INSTRUMENTS

Each instrument used for leak detection and evaluation shall be operated in accordance with the manufacturer’s recommended operating instructions.

#### CALIBRATION OF INSTRUMENTS

Each instrument used for leak detection and evaluation shall be calibrated at the prescribed times in accordance with the manufacturer’s recommended calibration instructions. See the last page on this procedure for documentation regarding conversion curves when using CGI’s calibrated for natural gas. (Note: If conversion curves are used, each Operator should ensure that the conversion curves are representative of the CGI being used)

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### Propane Walking Gas Leakage Survey

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#### Characteristics & Properties of Propane

Composition of Propane (Approximates as composition may vary by supplier)

- Propane – 95% - 100% by volume
- Propylene – 0% - 5% by volume
- Butane – 0% - 2.5% by volume

Toxicity

Propane is believed to be non-toxic; however, at very high concentrations, propane can displace the oxygen and asphyxiation may occur.

Other Properties

Extremely Flammable

Compressible

In its liquid state, can cause burns similar to frostbite

Odorless

Tasteless

**Note:** Ethyl mercaptan is added as an odorant which gives propane its unique odor to aid in leak detection.

Specific Gravity

Specific gravity can be defined as the ratio of the weight of a gas to the same volume of air as measured under the same temperature and pressure.

Propane is heavier than air and may “pool” in low areas and not readily dissipate.

Example: if a specific volume of air has specific gravity of 1, then the same volume of propane weighs 1.5, meaning that propane weighs 1 ½ times as much as the same volume of air.

Ignition Temperature & Explosive Limits

Ignition temperature of propane is approx. 874°F

Propane requires the proper mixtures of oxygen and propane before ignition can occur. The amount of gas-in-air must be within a specific range and this range is commonly referred to as the explosive limits of propane. The explosive limits of propane are expressed as:

**Lower Explosive Limit or L.E.L is approx. 2.1% gas-in-air** – If the gas-in-air is less than approx. 2.1%, the mixture will be too lean and ignition cannot occur.

**Upper Explosive Limit or U.E.L is approx. 9.5% gas-in-air** – If the gas-in-air is greater than approx. 9.5%, the mixture will be too rich and ignition cannot occur.

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### Propane Walking Gas Leakage Survey

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#### INSTRUCTIONS

The survey shall be conducted at speeds slow enough to allow an adequate sample to be continuously obtained by placement of equipment intakes over the most logical venting locations (See 1, 2, 3 below), giving consideration to the location of gas facilities.

1. For Aboveground Piping:

- Sampling of the atmosphere should, where practical, take place adjacent to the piping as close as permitted by gas detector design, due to the potential for rapid diffusion of leaking gas to the atmosphere. Particular attention should be paid at the bottom of piping/appurtenances as propane is heavier than air.

2. For Underground Piping:

- The survey should be conducted by performing barhole tests with a CGI in a series of barholes along or adjacent to the pipeline, to the approximate depth of the pipeline or slightly below, and at intervals of 20 feet or less. The sampling pattern should include tests at the building wall at any service risers or points of service line entrance.
  - Particular attention should be paid at areas where fittings could exist such as, but not limited to:
    - Main Tie-Ins
    - Service Taps
    - Stubs
    - Offsets (elbows, etc)
- Where piping system passes under paved areas for a distance of 20 feet or less, barholes should be made at the point of entrance and exit to the paved area.
- Where piping system passes under paved areas over the pipeline greater than 20 feet in length, sample points should be taken at intervals of 20 feet or less.
- In the case of extensive paving or large areas along the piping system, permanent sample points should be considered.
- When conducting barhole surveys, all barholes should penetrate to the pipe depth or slightly below, where necessary, in order to obtain consistent readings.
  - This includes penetrating through capping materials such as:
    - Paving, Concrete, Asphalt
    - Frost
    - Surface Sealing by Ice or Water
- The depth of the barhole will depend on soil conditions, the depth of and pressure in the pipeline, and the type of instrument being used.
- The readings should be taken at the bottom of the barhole.
- Take readings using the most sensitive scale on the instrument, being careful to watch for small indications of combustible gas.
- Any indication of a leak shall be further investigated by barholing and sampling with the CGI in all directions from the approximate center of the leak indication until zero % gas readings are detected.
  - If the leakage pattern extends to the outside wall of a structure, the leak investigation should continue to the inside of the structure if possible.
- Care should be taken to avoid damage to the pipe or coating with the probe bar.

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### Propane Walking Gas Leakage Survey

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#### 3. Available Subsurface Opening Adjacent to the Pipeline

- Samplings should be taken at, but not limited to, the following locations:
  - Curb Line(s)
  - Available ground surface openings, such as but not limited to:
    - Manholes
    - Catch Basins
    - Sewer, Power, & Telephone Duct Openings
    - Fire & Traffic Signal Boxes
    - Cracks in Pavement of Sidewalks
    - Any Point where Venting is Likely to Occur
  - Foundation Walls
- Note: When testing available openings for petroleum gas, readings should be taken at both the top and bottom of the structure if possible.

#### 4. Limitations

- Gas detector design or adverse conditions may **limit** the use of this survey method. Examples of adverse conditions that may affect the venting of subsurface gas leaks include, but are not limited to:
  - Moisture
  - Frost
  - Ice & Snow Cover
  - High or Gusting Wind

#### **Leak Classification, & Action Criteria**

When evaluating any gas leak indication, the initial step is to determine the grade/severity and perimeter of the leak area and take appropriate action in accordance with Operations and Maintenance Manual or Emergency Plan. If this perimeter extends to a building wall, the investigation(s) should continue into the building, if possible.

1. Before a leak can be classified, a determination shall be made as to the severity of the leak.
  - The migration of gas shall be determined by establishing the outer boundaries of the indications. These tests shall be made with a CGI.
  - If possible, locate all gas lines in the vicinity of the leak indication. Particular attention should be paid to the location of valves, fittings, tees, stubs, and connections.
  - If possible, all foreign facilities (i.e. other utilities, etc) in the area of the search should be identified.
  - Personnel should look for evidence of recent construction activities that may have contributed to the leakage.
  - Gas may also migrate and vent along a trench or bore-hole provided for other facilities. Leaks could occur at the intersection of the foreign facility and the gas pipeline; particular attention should be given to those intersections.
  - Evenly spaced bar or test holes should be used adjacent to, and to the approximate depth or slightly below, of the gas line(s) suspected to be leaking.
  - If possible, all bar or test holes should be of equal depth and diameter (and below the pipe where necessary).
  - All CGI readings should be taken at an equal depth and the readings recorded.

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| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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### Propane Walking Gas Leakage Survey

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2. Based on the evaluation of the location or magnitude of a leak, or both, leaks shall then be graded in accordance with the [Operator Name's] leak classification criteria. The judgment of the personnel at the scene is of the primary importance in determining the grade assigned to the leak.
  - **Note: Underground leaks must be graded using a Combustible Gas Indicator (CGI). A CGI is a device capable of detecting and measuring gas concentrations, of the gas being transported, in the atmosphere.**
3. All leaks shall be repaired / monitored according to the [Operator Name's] leak classification and action criteria.
4. When a leak is to be re-evaluated, it shall be re-evaluated and classified using the same procedure that was used in the initial classification of the leak.

#### Precautions

- The survey equipment being used should be calibrated for propane or a conversion of the readings needs to be made to account for the differences between propane and the gas for which the combustible gas indicator was originally calibrated for. The last page of this procedure contains conversion curves for a model H combustible gas indicator calibrated for natural gas.
- When placing bar or test holes for testing, consideration shall be given to bar or test-hole placement and depth to minimize the potential for damage to gas pipeline facilities and possible injury to personnel conducting the investigation.
- Caution should also be exercised to prevent damage to other underground structures when barholing or excavating.
- Unusual situations may complicate investigation techniques on some occasions such as, but not limited to:
  - Multiple leaks
  - Foreign gases
  - Gas detected in storm-drain or sewer systems
  - Gas detected in telephone or other duct runs
    - These indications should be considered migrating gas leakage until proven otherwise by test or analysis.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operations and Maintenance Manual.

#### RELATED PROCEDURES

- 1231 – Inside Gas Leak Investigation
- 1241 – Outside Gas Leak Investigation
- 1264 – Walking Gas Leakage Survey

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| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Propane Walking Gas Leakage Survey

#### ABNORMAL OPERATING CONDITIONS

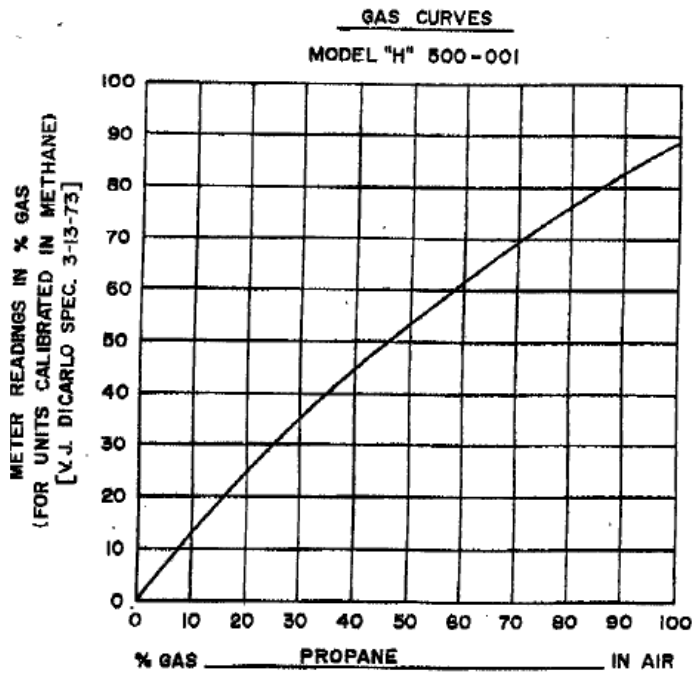
| <b>AOC Main Category</b> & Examples of Specific AOCs   | Reactions to AOC, as appropriate  |  |
|--|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Pressure Deviation</b> <ul style="list-style-type: none"> <li>Unplanned Decrease in Pressure &amp; or No Press.</li> <li>Unplanned Increase in Pressure</li> </ul>                | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Flow Rate Deviation</b> <ul style="list-style-type: none"> <li>Unplanned Increase in Flow</li> <li>Unplanned Decrease in Flow &amp; or No Flow</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization &amp; or Odor complaint</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Improper Installation/Misalignment of Components</b> <ul style="list-style-type: none"> <li>Improper fitting/component installation</li> <li>Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Propane Walking Gas Leakage Survey



|   |             |
|---|-------------|
| NFPA BUL. NO. _____                                       | LEL _____ % |
| B. OF MINES BUL. NO. _____                                | LEL _____ % |
| ELEMENT TYPE <u>800-023-00</u> AT <u>1.76</u> BRIDGEVOLTS |             |
| BRIDGE _____ 100% UNLOADED OR _____                       |             |
| DATA TAKEN BY <u>M.S.</u> DATE <u>7-26-73</u>             |             |
| DATA CONVERTED TO METER READINGS <u>A. WILLIS</u>         |             |
| COMMENT   | _____       |

Note: The numbers on the left side represent readings from a CGI calibrated for natural gas. The numbers across the bottom are the corresponding readings for propane.

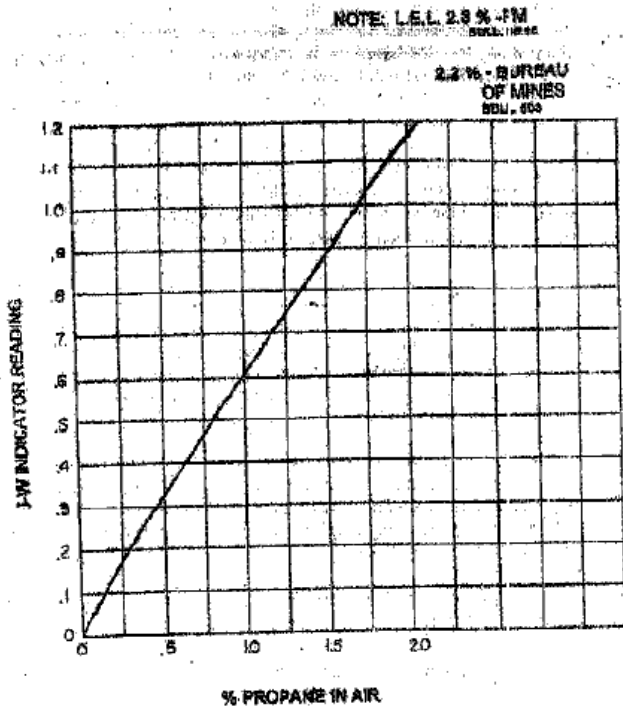
Example: Using a CGI calibrated for natural gas, a reading of 80% is obtained. To convert this reading to propane, begin by finding 80 on the left side, move across the chart to the curved line, and then move down the chart to find a converted reading of 85%.

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### Propane Walking Gas Leakage Survey

Conversion Chart - CGI LEL reading to LEL Propane



| CGI Indication (LEL Scale) | % Propane |
|----------------------------|-----------|
| .1                         | .13       |
| .2                         | .28       |
| .3                         | .45       |
| .4                         | .63       |
| .5                         | .82       |
| .6                         | 1.0       |
| .7                         | 1.2       |
| .8                         | 1.35      |
| .9                         | 1.57      |
| 1.0                        | 1.7       |

The chart above depicts readings taken with a CGI on the L.E.L scale along with a conversion to show the applicable percent of propane based on those readings.

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### Locate Underground Pipelines

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#### SCOPE AND PURPOSE

This procedure is to ensure that the location of this Operator's buried gas pipelines in the vicinity of proposed excavation activity is marked in accordance with 49 CFR 192.614(c)(5).

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that underground pipelines are located as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Wear a reflective safety vest and use care when locating lines under or near roadways and in other areas where moving vehicles are present. When arriving at the location look for obstacles, surface conditions and other features that may pose a safety hazard.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Line locating instrument
- Yellow paint, flags and/or other marking types
- Other equipment and materials as needed
- Manufacturer's instructions

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

- a. Check the batteries in both the transmitter and the receiver. If the batteries are low, replace them with new ones or recharge them according to the manufacturer's recommendations
- b. Go to the location indicated on the locate ticket.
- c. Consult the maps and/or records to verify the approximate location of the buried piping.
- d. (Conductive method) Attach the pipe lead to the pipe, test station, tracer wire, or any appurtenance that is in good electrical contact with the structure to be located. Make sure that there is no rust or paint to interfere with the connection.  
(Inductive method) If there is no place to hook directly to the tracer wire or pipeline position the transmitter as nearly as possible directly over the tracer wire or pipeline Follow the instructions for the locating instrument to prevent being too close to the transmitter with the receiver (typically 30 - 75 feet from the transmitter).
- e. Attach the ground wire to a suitable ground or ground stake that is located as far from the structure to be located as possible.
- f. Turn the transmitter on and make any adjustments necessary to ensure proper operation. Use the lowest frequency possible at the lowest power output possible to minimize the "bleed over" of the signal to adjacent facilities. Note that not all locating devices have a frequency adjustment.

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**Locate Underground Pipelines**

- g. Turn the receiver on and adjust the sensitivity setting on the receiver to a workable level.
- h. Follow the instructions for the line locating instrument to locate the buried piping.
- i. Mark the location of the gas lines. Markings may include one or any combination of the following: paint, chalk, flags, stakes, brushes or offsets.

Note: The Georgia Underground Marking Standards found in Appendix S-2 of the SRCS Operations & Maintenance Manual govern this Procedure.

- (i) Indicate gas lines by placing their UPC alpha code, along with the type material (if known) that the facility consists of, at the beginning and end of locates. Also, arrows should be placed at the ends of markings to indicate that the underground facility continues.
- (ii) To avoid confusion on long runs, the marks shall be frequent enough to identify the owner.
- (iii) The marks shall indicate the approximate center-line of the gas lines. For example, the middle of the pipe shall be at the center of the dashed marks.
- (iv) Location marks shall be 4 to 12 inches in length and at intervals of 5 to 10 feet.
- (v) Extend marks outside the proposed work area by 20 to 30 feet if those facilities extend outside the proposed excavation area.
- (vi) In areas such as flower beds, rock gardens, etc., flags or stakes may be an alternative to paint. The decision to use flags, paint, or stakes shall be based on the terrain and job conditions. For instance, flags or stakes in wet areas, offsets in dirt construction zones that have a high volume of traffic crossing their line location marks.
- (vii) Dead ends, stub-outs, termination points, etc., shall be marked as follows:  
    ← ABC---] [---XYZ→
- (viii) Lines that have connections (e.g., T's) or changes in directions shall be clearly indicated. Marks indicating lines or connections shall clearly show the intersection and path of the line or connection. Marks that show changes in direction shall be placed closer together for more clarity and accuracy.
- (ix) Valves shall be identified by using a circle and letters if they are not visible (dirt or pavement covering valve boxes).
- (x) Facilities that cross but do not intersect shall be marked as described in the GPSC Marking Standards to indicate such installation manner.
- (xi) When facilities share the same trench, they shall be heavily identified and separated enough so that they can be readily identified.
- (xii) If the facility to be marked has a diameter greater than 12", the size of the facility shall be indicated if known. If the size is not known, then the mark shall indicate greater than 12 inches.
- (xiii) In areas where there is a strong likelihood that any or all marker types showing line location would be destroyed, offsets shall be placed on a permanent surface. However, offsets should be used only in conjunction with marks placed above a facility. Offset spacing should be every third or fourth mark.

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

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### Locate Underground Pipelines

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

None

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>Coating Damage</li> <li>Corrosion Damage</li> <li>Dents, Gouges, Scrapes, etc.</li> </ul>                           | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization &amp; or Odor complaint</li> </ul>          | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| B31Q Task # - 1301     | Page 1 of 2  |
| Revision date: 4/14/08 | Version: 2.1 |

### Install and Maintain Pipeline Markers

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#### SCOPE AND PURPOSE

This procedure is to provide personnel installing and maintaining pipeline markers with a safe and effective procedures to ensure the integrity of the piping system. It describes practices required to comply with §192.707.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the installation and maintenance of pipeline markers are performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

- Use the required safety equipment.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Marker driver and cap
- Posthole diggers
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to install and maintain pipeline markers. Refer to the OQ Plan for specific qualification requirements.

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| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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| <b>B31Q Task # - 1301</b> | Page 2 of 2  |
| Revision date: 4/14/08    | Version: 2.1 |

### Install and Maintain Pipeline Markers

#### INSTRUCTIONS

- a. Identify all locations of buried and above ground facilities that require installation of pipeline markers. Pipeline markers are not required on mains in Class 3 or 4 Locations where a damage prevention program is in effect. A line marker must be placed as close as practical over each buried main and transmission line including each crossing of a public road and railroad and wherever necessary to identify the location of the pipeline to reduce the possibility of damage or interference
- b. Markers should be installed at a frequency on the right of way where there is no place a marker can not be seen, if possible.
- c. Pipeline markers must be placed along each section of a main or facility that is located above ground including but not limited to:
  - Town border stations
  - District regulator stations
  - Relief valve vent stacks
  - Valve settings
  - Bridge crossings
  - Odorizer settings
  - Telemeter settings
- d. All signs must have the information needed to identify the product in the line including company name and phone numbers where responsible parties can be reached at all times.
- e. Ensure that installed markers are in good condition and the markings are legible and the information is correct.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization &amp; or Odor complaint</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Improper Installation/Misalignment of Components</i></b> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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| B31Q Task #1311         | Page 1 of 4  |
| Revision Date: 08/26/08 | Version: 2.0 |

### Inspect Pipeline Surface Conditions – Patrol Right-of-Way or Easement

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#### SCOPE AND PURPOSE

This procedure includes performing right-of-way or easement patrol (e.g. walking or driving) to visually identify signs of leaks, encroachments, conditions of the right-of-way, or any other signs of potential impact to pipeline safety or integrity. It describes the practices required by §§192.705 & 192.721.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that the patrolling of pipelines are performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Maps/Records, if available
- Method(s) of communication, if available
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

##### General

- At a minimum, the frequency of patrols for transmission lines and distribution lines may not be less than the prescribed intervals found in §§192.705 and 192.721 respectively – these frequencies should also be stated in the Operations and Maintenance Manual.

##### Patrolling – Transmission Lines

- Transmission lines should be patrolled, either by walking or driving along pipeline rights-of-ways and easements, to observe factors that may affect safe operation and to enable the correction of potentially hazardous conditions.
- Patrol considerations should include observation and reporting of potential hazards such as, but not limited to
  - Visual evidence of leakage
  - Excavation, grading, demolition, or other construction activity which could result in
    - Damage to the pipe
    - Loss of support due to settlement or shifting of soil around the pipe
    - Undermining or damage to pipe supports
    - Loss of cover
    - Excessive fill

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| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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### Inspect Pipeline Surface Conditions – Patrol Right-of-Way or Easement

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- Evidence that excavation, grading, demolition or other construction activity may take place or has taken place, such as power equipment staged in the vicinity of transmission facilities or a freshly backfilled excavation over or near transmission facilities.
- Physical deterioration of exposed piping, pipeline spans, and pipe supports such as bridges, pilings, headwalls, casing, and foundations.
- Land subsidence, earth slippage, soil erosion, extensive tree root growth, flooding, and other natural causes that can result impressed secondary loading.
- The need for additional pipeline identification markers in private right-of-ways and in rural areas.
- Damage to casing vents and leakage from encased pipe.
- Locations or areas that are found to be potentially hazardous during patrolling may be patrolled more frequently based on the probable severity, timing, and duration of the hazard.
- Where practical, the patrol map or other documentation used by personnel performing the patrol should identify areas near the transmission line that may require special attention such as locations where earthmoving activities are regularly performed
  - In those areas where excavation activities are performed on a regular basis, consideration should also be given to providing those excavators with more frequent damage prevention and public awareness education materials
- Patrol reports should
  - Indicate the nature and location of any deficiencies discovered
  - Indicate any hazardous or potentially hazardous condition found
  - Document any corrective action taken
  - If corrective action has not been taken, note any recommended action items
- If available, compare the current patrol conditions against conditions observed during previous patrols.

#### Patrolling – Distribution Lines

- Distribution lines should be patrolled, either by walking or driving along pipeline rights-of-ways and easements, to observe factors that may affect safe operation and to enable the correction of potentially hazardous conditions.
- Patrol considerations should include observation and reporting of potential hazards such as, but not limited to
  - Visual evidence of leakage
  - Excavation, grading, demolition, or other construction activity which could result in:
    - Damage to the pipe
    - Loss of support due to settlement or shifting of soil around the pipe
    - Undermining or damage to pipe supports
    - Loss of cover
    - Excessive fill
  - Evidence that excavation, grading, demolition or other construction activity may take place or has taken place, such as power equipment staged in the vicinity of distribution facilities or a freshly backfilled excavation over or near distribution facilities.
  - Physical deterioration of exposed piping, pipeline spans, and pipe supports such as bridges, pilings, headwalls, casing, and foundations.

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### Inspect Pipeline Surface Conditions – Patrol Right-of-Way or Easement

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- Land subsidence, earth slippage, soil erosion, extensive tree root growth, flooding, and other natural causes that can result impressed secondary loading.
- The need for additional pipeline identification markers in private right-of-ways and in rural areas
- Damage to casing vents and leakage from encased pipe
- Locations or areas that are found to be potentially hazardous during patrolling may be patrolled more frequently based on the probable severity, timing, and duration of the hazard.
- Where practical, the patrol map or other documentation used by personnel performing the patrol should identify areas near the distribution line that may require special attention such as locations where earthmoving activities are regularly performed
  - In those areas where excavation activities are performed on a regular basis, consideration should also be given to providing those excavators with more frequent damage prevention and public awareness education materials
- *Places or structures where physical movement or external loading may cause leakage or failure should be identified based on the knowledge of the system characteristics and problem areas. Areas of consideration for distribution patrolling include, but are not limited to, the following:*
  - *Bridge crossings*
  - *Aerial crossings*
  - *Unstable river banks*
  - *Exposed water crossings*
  - *Areas susceptible to washout*
  - *Landslide areas*
  - *Areas susceptible to earth subsidence*
  - *Tunnels*
  - *Railroad crossings*
  - *Attachments to buildings or other structures*
  - *Facilities or support structures which require maintenance, until repaired*
  - *Certain areas of proximity to other Operator's facilities (Specific to Georgia)*
- Patrol reports should:
  - Indicate the nature and location of any deficiencies discovered
  - Indicate any hazardous or potentially hazardous condition found
  - Document any corrective action taken
  - If corrective action has not been taken, note any recommended action items
- If available, compare the current patrol conditions against conditions observed during previous patrols.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

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| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
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### Inspect Pipeline Surface Conditions – Patrol Right-of-Way or Easement

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>Coating Damage</li> <li>Corrosion Damage</li> <li>Dents, Gouges, Scrapes, etc.</li> </ul>                           | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization &amp; or Odor complaint</li> </ul>          | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| Revision date: 06/27/16      | Version: 2.1 |

### Damage Prevention during Excavation Activities By or On Behalf of the Operator and Provide or Assure Adequate Pipeline Support During Operator Initiated Excavation Activities

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#### SCOPE AND PURPOSE

This procedure is to assure the performance of damage prevention activities during excavation by the utility or its contractors. It describes damage prevention practices required to comply with §192.614.

#### RESPONSIBILITY

The [City of Thomasville Gas Superintendent](#), or other designee, is responsible to ensure that excavation by utility personnel or utility contractors it is performed as described in this procedure.

If Operator believes pipeline could be damaged by excavation activities:

- An inspection must be performed as frequently as necessary during and after the activities to verify the integrity of the pipeline; and
- In the case of blasting, any inspection must include leakage surveys.

#### PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

Maintain a safe distance from construction equipment and the edge of the excavation.

#### EQUIPMENT AND MATERIALS

As Needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

- a. Before commencing any digging check to see that the [GUCC Georgia 811](#) has been notified and that all underground utilities have been properly marked. Refer to the requirements of [Georgia 811 Common ground Alliance](#) for marking and excavating requirements.
- b. Take care to protect and preserve the staking, marking or other designations for underground facilities until no longer needed for proper and safe excavation. Stop excavating and notify the "One-Call" Center for re-mark if any facility marking is removed or no longer visible
- c. Hand dig near the markings to locate the buried facility.
- d. If directional boring is to occur, expose the marked facilities at the point where the bore is to cross the marked facilities. Using safe, prudent, non-evasive methods to pothole, hand dig, vacuum, etc., to manually determine the actual facility location, exposing a visual clearance zone of the marked facility.
- e. Provide an observer to assist the equipment operator when excavating around known underground facilities.

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**Damage Prevention during Excavation Activities By or  
On Behalf of the Operator and  
Provide or Assure Adequate Pipeline Support During  
Operator Initiated Excavation Activities**

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- f. If another utility line/cable is encountered during an excavation, power excavating should stop and the utility should be exposed using hand tools.
- g. Provide proper support for exposed pipe, both those owned by the utility and facilities owned by other utilities. Support should be provided to avoid excessive sagging. All supports should be free from sharp edges.
- h. Ensure that care is exercised when digging or work around the utility’s gas facilities. Care should be taken when equipment is working near exposed facilities.
- i. If the excavation is near vehicular surfaces (streets, roadways, parking lots, etc.) ensure that suitable barricades are set up to protect against vehicular intrusion.
- j. Nothing should be supported by exposed pipelines, cables and other exposed facilities.
- k. Do not climb on, strike or attempt to move facilities.
- l. Where possible, the soil excavated from the trench should be placed at least 2 feet from the edge of the trench to reduce the chance of cave-ins.
- m. Shoring or other trench stabilization methods are required under the following circumstances:
  - when the trench depth is 5 feet or more (or less if specified in utility policy)
  - when the soil is loose and granular
  - when the soil is very wet or saturated
  - when a Competent Person determines that any combination of the above warrants shoring
- n. When employees are required to be in trenches 4 feet deep or more, an adequate means of exit, such as an approved ladder or steps, should be provided and located so as to require no more than 25 feet of lateral travel. Ladders should extend at least 3 feet above the top of the trench and be secured.
- o. A visual inspection of the pipe condition must be performed before the gas pipe is reburied (See Procedure # 0151).
- p. Ensure that the backfill, even if it is the original soil, is free from old paving, rocks, debris, large clods or any other thing that might damage the pipeline or coating
- q. If the pipeline has been supported during excavation, do not remove the supports until the soil under the piping has been compacted until it can support the pipeline adequately. Fill evenly from both sides and compact in lifts so that the compaction is even and resembles original soil. Do not compact excessively on plastic mains or on tapping tees or other facilities that can be damaged by soil movement.

**REPORTING/NOTIFICATION**

Complete documentation in accordance with Operation and Maintenance Manual.

**RELATED PROCEDURES**

- 0151 - Visual Inspection of Buried Pipe and Components When Exposed
- 1291 - Locate Underground Pipelines
- 1331 - Damage Prevention Inspection during Third Party Excavation or Encroachment Activities as Determined Necessary by Operator
- 10 – Horizontal Directional Drilling

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### Damage Prevention during Excavation Activities By or On Behalf of the Operator and Provide or Assure Adequate Pipeline Support During Operator Initiated Excavation Activities

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|--|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Pipeline Damage</i></b> <ul style="list-style-type: none"> <li>Coating Damage</li> <li>Corrosion Damage</li> <li>Dents, Gouges, Scrapes, etc.</li> </ul>                           | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Unplanned Status Change</i></b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b><i>Inadequate Odorization or Reports of Gas Odor</i></b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization &amp; or Odor complaint</li> </ul>          | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Damage Prevention Inspection during Third Party Excavation or Encroachment Activities

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#### SCOPE AND PURPOSE

This procedure is to assure the performance of damage prevention activities during excavation by third parties. It describes damage prevention practices required to comply with §192.614.

#### RESPONSIBILITY

The [City of Thomasville Gas Superintendent](#), or other designee, is responsible to determine when observation of a third party excavation is necessary and to ensure that, when necessary, it is performed as described in this procedure.

If Operator believes pipeline could be damaged by excavation activities:

- An inspection must be performed as frequently as necessary during and after the activities to verify the integrity of the pipeline; and
- In the case of blasting, any inspection must include leakage surveys.

#### PERSONNEL SAFETY (Where Applicable)

Maintain a safe distance from construction equipment and the edge of the excavation.

In the event the gas line is ruptured evacuate all personnel to a location upwind of the leak and implement the Emergency Plan.

#### EQUIPMENT AND MATERIALS

None

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

#### INSTRUCTIONS

- When arriving at the excavation site, locate the person in charge and identify yourself as a representative of [City of Thomasville](#). Tell them that there are gas pipelines in the area and you are there to observe and assist them to locate and work safely around the gas piping.
- Check that the [GUCC Georgia 811](#) has been notified and that all underground utilities have been properly marked. For proper marking refer to the requirements of [Georgia 811](#).
- Re-mark following procedure # 1291 if the marking for the gas pipeline is removed or no longer visible.
- Encourage the excavator to hand dig near the markings to locate the buried facility.
- If directional boring is to occur, expose the marked facilities at the point where the bore is to cross the marked facilities. Using safe, prudent, non-evasive methods to pothole, hand dig, vacuum, etc., to manually determine the actual facility location, exposing a visual clearance zone of the marked facility.
- Ensure the excavator provides proper support for exposed pipe, both those owned by the utility and facilities owned by other utilities. Support should be provided to avoid excessive sagging. All supports should be free from sharp edges.

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### Damage Prevention Inspection during Third Party Excavation or Encroachment Activities

- g. Ensure that care is exercised when digging or work around the utility's gas facilities. Care should be taken when equipment is working near exposed facilities.
- h. Nothing should be hung from or slung over exposed gas pipelines.
- i. If any portion of the utility's pipe is exposed, a visual inspection of the pipe condition must be performed before the gas pipe is reburied (See Procedure # 0151).
- j. Ensure that the backfill, even if it is the original soil, is free from old paving, rocks, debris, large clods or any other thing that might damage the pipeline or coating
- k. If the pipeline has been supported during excavation, do not remove the supports until the soil under the piping has been compacted until it can support the pipeline adequately. Fill evenly from both sides and compact in lifts so that the compaction is even and resembles original soil. Do not compact excessively on plastic mains or on tapping tees or other facilities that can be damaged by soil movement.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

#### RELATED PROCEDURES

0151 - Visual Inspection of Buried Pipe and Components When Exposed

1291 - Locate Underground Pipelines

1321 - Damage Prevention during Excavation Activities By or On Behalf of the Operator

10 – Horizontal Directional Drilling

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization &amp; or Odor complaint</li> </ul>          | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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### Vault Inspection and Maintenance

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#### SCOPE AND PURPOSE

This procedure includes performing inspection and testing of underground vaults to identify signs of leaks, conditions of the vault, or any other signs of potential impact to public and or personnel safety. It describes the maintenance and inspection practices required to comply with §192.749.

#### RESPONSIBILITY

The [City of Thomasville Gas Superintendent](#), or other designee, is responsible to ensure that vault inspection and maintenance procedures are performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

- No open flames.
- No smoking
- Ensure that cell phones, pagers, and radios and ventilation equipment are intrinsically safe for vault entry.
- Use the required safety equipment.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Gas Detector Equipment
- Combustible Gas Indicator (CGI)
- Communication method (Radio, Cell Phone, etc)
- G450 Multi-gas and Oxygen Detector
- Ventilation fan
- Safety harness
- Other equipment and materials as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform vault inspection and maintenance. Refer to the OQ Plan for specific qualification requirements.

#### MAINTENANCE & OPERATION OF INSTRUMENTS

Each instrument used for leak detection and evaluation, and oxygen level monitoring, shall be operated in accordance with the manufacturer's recommended operating instructions.

#### CALIBRATION OF INSTRUMENTS

Each instrument used for leak detection and evaluation, and oxygen level monitoring, shall be calibrated at the following times in accordance with the manufacturer's recommend calibration instructions.

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### Vault Inspection and Maintenance

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#### INSTRUCTIONS

##### **a. Annual Inspection**

- i. While approaching the vault, observe the area for obvious signs of a gas leak in the area (use sight, smell, and hearing), including, but not limited to:
  - Dead or dying grass, shrubs, or trees
  - Absence of growth in paving cracks
  - Cracked or crusted soil, or mildewed soil
  - Absence of grass overhang on curbing or walkways
  - Odor of gas or sound of escaping gas
- ii. Visually inspect the area around the vault for evidence that excavation, grading, demolition or other construction activity that may take place or has taken place, such as power equipment staged in the vicinity, or a freshly backfilled excavation over or near the vault.
- iii. Visually inspect signage or pipeline markers for accurate contact information for City of Thomasville in case of emergency.
- iv. Using an instrument capable of alerting the user to the presence of a gas leak, check around the outside perimeter of the vault for an indication of a gas leak.
- v. If gas is detected, probe around the outside perimeter of the vault and obtain CGI readings. Refer to [City of Thomasville](#) Emergency Plan for leak classification and action criteria.
- vi. Slightly open the cover door to admit the testing probe, to test the vault atmosphere combustible gas.
- vii. Open the vault door; visually inspect the condition of the vault, door and other equipment for damage, hazards, or debris obstructions.
- viii. Inspect ventilation equipment.

##### **b. Vault Entry:**

- i. Slightly open the vault door to admit the testing probe, using to test the vault atmosphere for combustible gas.
- ii. Immediately after opening the vault door, using a CGI, tests for combustible gas and test for oxygen deficiency at various levels that can be reached from the surface.
- iii. Results of the tests made in accordance with i. and ii. above should determine the procedures to be followed:
  - Combustibles at 60% of the Lower Explosive Limit (3.0% natural gas in air) or less. The vault may be entered without breathing apparatus after establishing, by test, that a safe oxygen level exists, or if continuous forced ventilation is maintained.
  - Combustibles in excess of 60% of the Lower Explosive Limit (3.0% natural gas in air). The vault should not be entered unless ventilation maintains a combustible level below 60% of the Lower Explosive Limit and a safe oxygen level exists. However, in the event the vault cannot be adequately ventilated and the facility cannot be taken out of service to effect necessary repairs, the vault may be entered with the use of an approved breathing apparatus and safety harness.

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### Vault Inspection and Maintenance

- **Safe Oxygen Level** Oxygen levels that are too low (less than 19.5 percent) can cause an initial loss of awareness and lead to suffocation and death. Oxygen levels that are too high (greater than 22 percent) can cause a fire hazard by allowing a fire to burn at a rate that is faster than normal.
- Where steps are not installed, ladders will be used when entering or leaving vaults
- Upon entering a vault, inspect or test the interior for abnormal or hazardous conditions. (c) In all cases where workers enter vaults, at least one person will remain on the surface and not leave the work location. In the event workers require a breathing apparatus and safety harness in accordance with iii. above, at least two persons will remain on the surface (one being in a position to observe activity in the vault at all times)
- In all cases where workers enter vaults, the atmosphere will be retested for combustible gases and oxygen deficiency at intervals not to exceed one hour.
- Only approved flashlights or lighting equipment should be used. Electrical connections and disconnections should be made outside the vault. See guide material under §192.751.

### REPORTING/NOTIFICATION

Complete documentation in accordance with Operations and Maintenance Manual.

### RELATED PROCEDURES

1241 – Outside Gas Leak Investigation

1261 – Walking Gas Leakage Survey

1311 – Inspect Pipeline Surface Conditions – Patrol Right of Way or Easement

### ABNORMAL OPERATING CONDITIONS

| <i>AOC Main Category</i> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b><i>Unplanned escape of product from a pipeline</i></b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b><i>Fire or Explosion</i></b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>                     | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |

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### Vault Inspection and Maintenance

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| <p><b><i>Unplanned Pressure Deviation</i></b></p> <ul style="list-style-type: none"> <li>• Unplanned Decrease in Pressure &amp; or No Press.</li> <li>• Unplanned Increase in Pressure</li> </ul>                | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <p><b><i>Unplanned Flow Rate Deviation</i></b></p> <ul style="list-style-type: none"> <li>• Unplanned Increase in Flow</li> <li>• Unplanned Decrease in Flow &amp; or No Flow</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <p><b><i>Unplanned Status Change</i></b></p> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <p><b><i>Inadequate Odorization or Reports of Gas Odor</i></b></p> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization &amp; or Odor complaint</li> </ul>                       | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>       | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <p><b><i>Improper Installation/Misalignment of Components</i></b></p> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Notify appropriate personnel</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |

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### Direct Examination Techniques – Holiday Detection

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#### SCOPE AND PURPOSE

This procedure provides personnel activities with techniques to be used in the direct examination of pipeline facilities. It describes practices required to comply with §192.461(c).

The direct examination method described in this procedure is limited to the use of coating holiday detection (jeeping). Other direct examination techniques such as visual inspection are addressed in procedure 0151-0201-0641 (See related procedure section below. This procedure DOES NOT cover the use of ultrasonic testing.

#### RESPONSIBILITY

The [City of Thomasville Gas Superintendent](#), or other designee, is responsible to ensure that the direct examination techniques are performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

- Ignition and potential ignition sources should be eliminated.
- Operator should be aware of possibility of electrical shock from instrument.

#### EQUIPMENT AND MATERIALS (As Needed)

Necessary equipment and materials to perform the task, such as, but not limited to:

- Holiday detector equipment (Jeep)
- Other tools and equipment as needed

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform the direct examination techniques as described in this procedure. Refer to the OQ Plan for specific qualification requirements.

#### MAINTENANCE & OPERATION OF INSTRUMENTS

Each instrument used to perform direct examination of pipelines shall be operated in accordance with the manufacturer's recommended operating instructions.

#### INSTRUCTIONS

- a. Prepare holiday detector instrument for operation.
- b. Determine the correct voltage for the given thickness coating.
- c. Prepare the unit for operation, ensuring that:
  - The desired voltage is set for the given thickness coating.
  - A good electrical ground is available for both the pipe and the instrument.
- d. During operation, the speed of travel of the electrode should not be excessive as this can result in a faulty inspection.
  - Consideration should also be given to occasional checks of the instrument, particularly if no holidays are being found.

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### Direct Examination Techniques – Holiday Detection

- e. As coating holidays are discovered, mark or otherwise denote the location of the coating holiday for repair before continuing with the direct examination.
- f. Further direct examinations of the repaired sections of the pipeline shall be performed once repairs to the coating have been completed.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operations and Maintenance Manual.

#### RELATED PROCEDURES

0151 – Visual Inspection of Buried Pipe and Components When Exposed

0201 – Visual Inspection of Installed Pipe and Components for Mechanical Damage

0641 – Visually Inspect Pipe and Components Prior to Installation

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|---|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Pipeline Damage</b> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Scrapes, etc.</li> </ul>                         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization &amp; or Odor complaint</li> </ul>          | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

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| <b>B31Q SIF Task # 1701</b> | Page 1 of 3  |
| Revision date: 08/23/13     | Version: 2.1 |

### Isolating, Abandoning and Deactivating Pipeline Facilities

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#### SCOPE AND PURPOSE

This procedure provides personnel activities for isolating, abandoning and deactivating pipeline facilities. It describes practices required to comply with §192.727.

#### RESPONSIBILITY

The [City of Thomasville, Gas Superintendent](#), or other designee, is responsible to ensure that isolating, abandoning and deactivating pipeline is performed as described in this procedure.

#### PERSONNEL SAFETY (Where Applicable)

- Personnel shall ensure that safety conditions exist. Anytime components are disconnected from the gas distribution system, there is a chance that gas will escape and cause a hazard.
- Ignition and potential ignition sources should be eliminated.
- A fire extinguisher must be present at the site placed at a suitable location.
- Establish a safety perimeter to prevent bystanders and unauthorized personnel from entering the area of activity.
- Welding activities may not be performed on piping containing a natural gas and air mixture.
- Personnel shall consult the manufacturer's installation and operating instructions for complete information on the uses of different types and styles of isolation and stoppering devices, equipment and tools.

#### EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Valve key wrench
- Ratchet wrench and socket
- Tapping tee hex wrench
- Stopper and drilling machines with tools and attachments
- Combustible gas indicator (CGI)
- Routine hand tools

#### OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform isolating, abandoning and deactivating pipeline. Refer to the OQ Plan for specific qualification requirements.

|                             |              |
|-----------------------------|--------------|
| <b>B31Q SIF Task # 1701</b> | Page 2 of 3  |
| Revision date: 08/23/13     | Version: 2.1 |

### Isolating, Abandoning and Deactivating Pipeline Facilities

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#### INSTRUCTIONS

- a. Whenever a pipeline or pipeline section is to be isolated, abandoned, or deactivated, it shall be identified.
- b. If branch lateral lines are connected to the pipeline section being shut down, either:
  - provide an alternate gas supply line (by pass), or
  - all interconnected piping must be identified and defined as part of the effected shut down piping.
- c. Close appropriate valves, utilize stopper fittings, end caps, blind flanges, or other appropriate devices to isolate the pipeline or facility.
- d. If service lines are connected to the pipeline section being shut down:
  - all service valves should be secured by locking the valve in the closed position until service is reestablished to the customer's premises, and
  - if possible, all customers should be contacted and advised of the service interruption.
- e. Purge isolated pipeline segment.
- f. If the line is to be disconnected from other activated pipelines (abandoned in place), the piping being shut down must be thoroughly purged. However, the pipeline need not be purged when the volume of gas is so small that there is no potential hazard.
- g. Personnel shall verify that the piping does not contain natural gas. A combustible gas indicator is to be employed for this task.
- h. Gas being expelled into the atmosphere must be vented at a place or area where it will be discharged safely.
- i. Seal ends of abandoned pipe.
- j. For a service line, one of the following must be done to prevent the flow of gas to the customer:
  - lock or otherwise secure the valve controlling gas to the service, or
  - install a mechanical device or fitting in the service line or meter set, or
  - disconnect the customer's piping from the gas supply.
- k. Remove any above ground facilities.

#### REPORTING/NOTIFICATION

Complete documentation in accordance with Operations and Maintenance Manual.

|                   |                              |               |
|-------------------|------------------------------|---------------|
| Prepared by: SRCS | Approved by: Jeremy Reynolds | Date: 9/22/14 |
|-------------------|------------------------------|---------------|

# City of Thomasville Natural Gas

## Operations and Maintenance Procedures

|                             |              |
|-----------------------------|--------------|
| <b>B31Q SIF Task # 1701</b> | Page 3 of 3  |
| Revision date: 08/23/13     | Version: 2.1 |

### Isolating, Abandoning and Deactivating Pipeline Facilities

#### RELATED PROCEDURES

1641-1651 – Purging with Gas, Air, or Inert Gas

#### ABNORMAL OPERATING CONDITIONS

| <b>AOC Main Category</b> & Examples of Specific AOCs  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <b>Unplanned escape of product from a pipeline</b> <ul style="list-style-type: none"> <li>Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Fire or Explosion</b> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; Property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> <li>➤ Notify Fire/Emergency Responders</li> <li>➤ Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Use appropriate PPE</li> <li>➤ Stop gas flow</li> <li>➤ Make repairs/eliminate AOC</li> </ul> |
| <b>Unplanned Pressure Deviation</b> <ul style="list-style-type: none"> <li>Unplanned Decrease in Pressure &amp; or No Press.</li> <li>Unplanned Increase in Pressure</li> </ul>         | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Flow Rate Deviation</b> <ul style="list-style-type: none"> <li>Unplanned Increase in Flow</li> <li>Unplanned Decrease in Flow &amp; or No Flow</li> </ul>                  | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Unplanned Status Change</b> <ul style="list-style-type: none"> <li>Inoperable/Failure of a Pipeline Component</li> <li>Stray Current on a Pipeline – Elec. Shock (Static)</li> </ul> | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Notify appropriate personnel</li> <li>➤ Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |
| <b>Inadequate Odorization or Reports of Gas Odor</b> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization &amp; or Odor complaint</li> </ul>                | <ul style="list-style-type: none"> <li>➤ Protect life &amp; property</li> <li>➤ Prevent accidental ignition</li> <li>➤ Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Locate source/cause of AOC</li> <li>➤ Make repairs/eliminate AOC</li> </ul>   |

# OQ Procedure 0301-B - Manually Opening and Closing Meter Valves

Thomasville Utilities Operations & Maintenance Manual - Version 2022.3 - September 15, 2022

## [SCOPE AND PURPOSE](#)

## [RESPONSIBILITY](#)

## [PERSONNEL SAFETY](#)

## [EQUIPMENT AND MATERIALS](#)

## [OPERATOR QUALIFICATION](#)

## [INSTRUCTIONS](#)

## [REPORTING/NOTIFICATION](#)

## [RELATED PROCEDURES](#)

## [ABNORMAL OPERATING CONDITIONS](#)

### **SCOPE AND PURPOSE**

This procedure is to ensure proper manual operation of valves (opening and closing), particularly ensuring that the initiation/re-initiation (commonly called a turn-on) of a customer's meter is performed in such a manner as to ensure that an unsafe condition does not exist.

### **RESPONSIBILITY**

Thomasville Utilities's designee is responsible to ensure that this procedure is performed as described below.

### **PERSONNEL SAFETY**

As necessary according to city policy

### **EQUIPMENT AND MATERIALS**

Proper fitting wrench (e.g. adjustable wrench, pipe wrench, etc.). Other equipment and materials as needed.

### **OPERATOR QUALIFICATION**

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform manual operation of valves. Refer to the OQ Plan for specific qualification requirements. This Operator Qualification requirement does not extend past the outlet side of the customer's meter.

### **INSTRUCTIONS**

**Note:** Any other Procedure referenced in or required for the completion of this Procedure may be performed by any individual Qualified in the performance of the other Procedure and authorized by the Thomasville Utilities to do so.

#### **Prior to Opening or Closing a Valve**

**Note:** The steps in this paragraph may be performed in any order.

1. Identify the valve(s) to be operated – for a meter turn-on, this may be accomplished by verifying that the meter number and address

2. Confirm that the valve(s) chosen is the correct valve to control the flow of gas to the customer
3. Attempt to contact the customer and advise them of the reason for your visit

**Turn On – Customer Not Home:**

(Ordered as a result of a shut-off for non-payment or customer-initiated turn-off).

1. If City/Company Policy is the customer must be home, leave service valve off and locked, and leave a card instructing the customer to call the gas department to schedule restoration of service.
2. When ready to proceed, remove the lock from the meter, if equipped.
3. Proof and spot the meter as follows:

**Note:** Proofing the meter demonstrates that the dials on the meter that register usage are working. "Spotting" the meter is a means for personnel to verify that there are no leaks past the outlet of the meter.

- a. Locate the dial on the meter that shows the smallest usage, commonly called the "test dial". Loosen the outlet meter spud and slowly turn the service valve on and verify that the hand on the test dial is moving. When the test dial is on the upswing, tighten the outlet meter spud so that the hand on the test dial stops on the upswing to insure there is no subsequent unintentional movement.
- b. Mark the location of this hand and watch this hand for a period of at least:
  - 5 minutes for a ¼" or ½" foot dial
  - 7.5 minutes for a 1 foot dial
  - 10 minutes for a 2 foot dial
  - 20 minutes for a 5 foot dial
  - Additional time may be required at the discretion of field personnel. Soap test the meter set for possible leaks. If the test dial hand has moved within this timeframe, this may be an indication of a leak downstream of the meter, in which case the service valve should be shut off until it is determined that there are no leaks past the outlet of the meter.
- c. If ever in doubt about how to proceed, or if personnel encounter a situation that they are not prepared to address, contact the supervisor immediately.
- d. If the test dial hand has not moved within the timeframe mentioned in (b) above, leave notice at the customer's premise stating that the gas is now turned on and ready for them to re-light their appliances, if part of City/Company Policy.

**Turn-On – Customer Home:**

1. Speak with the customer and verify the number/type of appliances and ensure that each appliance is turned off.
2. Remove the lock from the meter, if equipped.
3. Proof and Spot the meter as follows:

**Note:** Proofing the meter demonstrates that the dials on the meter that register usage are working. Spotting the meter is a means for personnel to verify that there are no leaks past the outlet of the meter.

- a. Locate the dial on the meter that shows the smallest usage, commonly called the "test dial". Loosen the outlet meter spud and slowly turn the service valve on and verify that the hand on the test dial is moving. When the test dial is on the upswing, tighten the outlet meter spud so that the hand on the test dial stops on the upswing to insure there is no subsequent unintentional movement.
- b. Mark the location of this hand and watch this hand for a period of at least
  - 5 minutes for a ¼" or ½" foot dial
  - 7.5 minutes for a 1 foot dial

- 20 minutes for a 5 foot dial
  - Additional time may be required at the discretion of field personnel. Soap test the meter set for possible leaks. If the test dial hand has moved within this timeframe, this may be an indication of a leak downstream of the meter, in which case the service valve should be shut off until it is determined that there are no leaks past the outlet of the meter.
- c. If ever in doubt about how to proceed, or if personnel encounter a situation that they are not prepared to address, contact your supervisor immediately.
- d. If the test dial hand has not moved within the timeframe mentioned in (b) above, begin re-lighting appliances, if a part of City/Company Policy.

### Closing of Valve(s) – Shutting Off Gas to a Customer

1. Attempt to notify customer (if part of City/Company Policy) to advise them of the reason for your visit (i.e. shut-off for non-payment, maintenance, etc.)
2. Identify the valve(s) to be operated – for a meter turn-on or turn-off this may be accomplished by verifying that the meter number and address
3. Confirm that the valve(s) chosen is the correct valve to control the flow of gas to the customer
4. Small valves at service risers may or may not be equipped with “valve-stops”, but the position of the valve can be determined by observing the position of the wrench-tab in relation to the service riser.

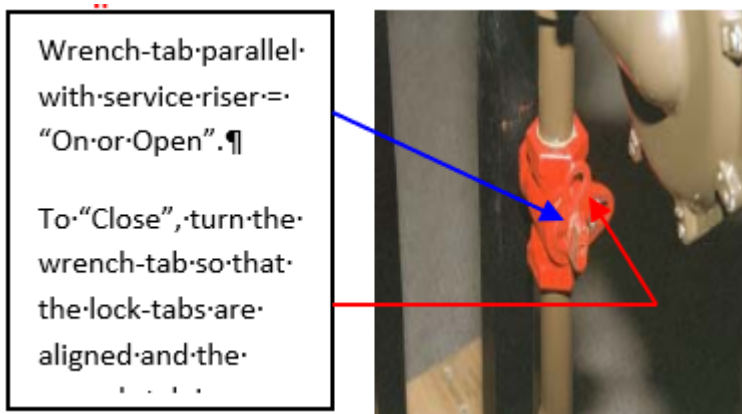


Image URL: [http://ops.dot.gov/regs/small\\_lp/images/Chapter3\\_img\\_5.png](http://ops.dot.gov/regs/small_lp/images/Chapter3_img_5.png)

5. Ensure that the valve(s) is free of visible debris, corrosion, or damage that may hamper the operation of the valve(s).
6. Using the appropriate tool, close the valve(s).
7. Install a locking device in the service valve, as required by the Operation and Maintenance Manual.

**Note:** If a locking device cannot be installed (e.g. service valve tabs broken), disconnect a mechanical device or fitting in the meter set or the customer’s piping from the gas supply to prevent the unauthorized flow of gas through the meter. Notify the Supervisor that the service valve could not be locked and generate a repair order.

### REPORTING/NOTIFICATION

Complete documentation in accordance with Operations and Maintenance Manual and Distribution Integrity Management Plan.

### RELATED PROCEDURES

[0331](#) - Valve - Visual Inspection and Partial Operation

[0341](#) - Valve - Preventive Maintenance

**ABNORMAL OPERATING CONDITIONS**

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| Unplanned escape of product from a pipeline <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>• Protect life &amp; Property</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> <li>• Notify Fire/Emergency Responders</li> <li>• Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Use appropriate PPE</li> <li>• Stop gas flow</li> <li>• Make repairs/eliminate AOC</li> </ul> |
| Fire or Explosion <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>• Protect life &amp; Property</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> <li>• Notify Fire/Emergency Responders</li> <li>• Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Use appropriate PPE</li> <li>• Stop gas flow</li> <li>• Make repairs/eliminate AOC</li> </ul> |
| Unplanned Flow Rate Deviation <ul style="list-style-type: none"> <li>• No Flow</li> <li>• Unplanned Decrease in Flow</li> <li>• Unplanned Increase in Flow</li> </ul>                       | <ul style="list-style-type: none"> <li>• Protect life &amp; property</li> <li>• Notify appropriate personnel</li> <li>• Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate AOC</li> </ul>   |
| Unplanned Status Change <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>• Protect life &amp; property</li> <li>• Notify appropriate personnel</li> <li>• Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate AOC</li> </ul>   |
| Inadequate Odorization or Reports of Gas Odor <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>• Protect life &amp; property</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate AOC</li> </ul>   |
| Improper Installation/Misalignment of Components <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>• Protect life &amp; property</li> <li>• Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>• Notify appropriate personnel</li> <li>• Make repairs/eliminate AOC</li> </ul>   |

[Procedure 0301-B Version 2.0 Revision Date 5/10/21]

# OQ Procedure 1061-B - Installation of Leak Repair Tape

Thomasville Utilities Operations & Maintenance Manual - Version 2022.3 - September 15, 2022

[SCOPE AND PURPOSE](#)

[RESPONSIBILITY](#)

[PERSONNEL SAFETY](#)

[EQUIPMENT AND MATERIALS](#)

[OPERATOR QUALIFICATION](#)

[INSTRUCTIONS](#)

[REPORTING/NOTIFICATION](#)

[RELATED PROCEDURES](#)

[ABNORMAL OPERATING CONDITIONS](#)

## **SCOPE AND PURPOSE**

This procedure is a non-B31Q Task used to provide personnel with safe and effective activities to ensure the integrity of its pipeline system when repairing leak(s) utilizing leak repair tape on steel pipelines.

## **RESPONSIBILITY**

The Thomasville Utilities's designee is responsible to ensure that the repair is performed as described in this procedure.

## **PERSONNEL SAFETY (Where Applicable)**

Every reasonable precaution shall be taken to protect employees and the general public.

Wear all required safety equipment as specified by the company.

## **EQUIPMENT AND MATERIALS**

Necessary equipment and materials to perform the task, such as, but not limited to:

- Leak repair tape AND installation instructions
- Combustible gas indicator, as needed
- Personal protective equipment as needed such as:
  - Flame retardant clothing
  - Fire extinguisher
  - Other tools and equipment necessary for completion of the work

## **OPERATOR QUALIFICATION**

This activity is a covered task under the Operator Qualification (OQ) Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.



**Note:** Any other covered task(s) required by this procedure may be performed by any individual qualified in the performance of the other task(s) and authorized by Thomasville Utilities to do so.

1. Verify that the leak repair tape selected is:

- Rated for the product being transported (i.e. natural gas)
- Rated for the Maximum Allowable Operating Pressure (MAOP) of the pipeline being repaired
- Rated for the size pipe being repaired

2. Install leak repair tape shall be installed in accordance with the manufacturer’s installation instructions

**REPORTING/NOTIFICATION**

Complete documentation in accordance with the Operation and Maintenance Manual.

**RELATED PROCEDURES**

Operations & Maintenance Manual Section [13-Z\(e\)](#) – Prevention of Accidental Ignition (§[192.751](#))

*Non-OQ Procedures:*

[05](#) - Precautions in Excavated Trenches

[06](#) - Continuing Surveillance

*OQ Procedures:*

[0001](#) - Measure Structure-to-Electrolyte Potential

[0141](#) - Visual Inspection for Atmospheric Corrosion

[0151](#) - Visual Inspection of Buried Pipe and Components When Exposed

[0201](#) - Visual Inspection of Installed Pipe and Components for Mechanical Damage

[0591](#) - Leak Test at Operating Pressure

[0641](#) - Visually Inspect Pipe and Components Prior to Installation

[0981](#) - Backfilling

[0991](#) - Coating Application and Repair - Brushed or Rolled

[1001](#) - Coating Application and Repair - Sprayed

[1011](#) - External Coating Application and Repair - Wrapped

[1291](#) - Locate Underground Facilities

[1321-1341](#) - Damage Prevention & Provide or Assure Adequate Support during Excavation Activities By or On Behalf of the Operator

**ABNORMAL OPERATING CONDITIONS**

| AOC Main Category & Examples of Specific AOCs   | Reactions to AOC, as appropriate   |  |
|---|--|--|
| Unplanned escape of product from a pipeline <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul> | <ul style="list-style-type: none"> <li>• Protect life &amp; Property</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> </ul> | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Use appropriate PPE</li> <li>• Stop gas flow</li> </ul> |

|  |   |  |
|--|---|--|
|  | <ul style="list-style-type: none"> <li>• Notify Fire/Emergency Responders</li> <li>• Initiate Emergency Plan</li> </ul>   | <ul style="list-style-type: none"> <li>• Make repairs/eliminate AOC</li> </ul>   |
| <p>Fire or Explosion</p> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>• Protect life &amp; Property</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> <li>• Notify Fire/Emergency Responders</li> <li>• Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Use appropriate PPE</li> <li>• Stop gas flow</li> <li>• Make repairs/eliminate AOC</li> </ul> |
| <p>Unplanned Flow Rate Deviation</p> <ul style="list-style-type: none"> <li>• No Flow</li> <li>• Unplanned Decrease in Flow</li> <li>• Unplanned Increase in Flow</li> </ul>                       | <ul style="list-style-type: none"> <li>• Protect life &amp; property</li> <li>• Notify appropriate personnel</li> <li>• Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate AOC</li> </ul>   |
| <p>Unplanned Status Change</p> <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>• Protect life &amp; property</li> <li>• Notify appropriate personnel</li> <li>• Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate AOC</li> </ul>   |
| <p>Inadequate Odorization or Reports of Gas Odor</p> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>• Protect life &amp; property</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate AOC</li> </ul>   |
| <p>Improper Installation/Misalignment of Components</p> <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>• Protect life &amp; property</li> <li>• Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>• Notify appropriate personnel</li> <li>• Make repairs/eliminate AOC</li> </ul>   |

[Procedure 1061-B Version 2.0 Revision Date 4/19/21]

# OQ Procedure 1711 - Insertion of Steel Service

Thomasville Utilities Operations & Maintenance Manual - Version 2022.3 - September 15, 2022

## [SCOPE AND PURPOSE](#)

## [RESPONSIBILITY](#)

## [PERSONNEL SAFETY](#)

## [EQUIPMENT AND MATERIALS](#)

## [OPERATOR QUALIFICATION](#)

## [INSTRUCTIONS](#)

## [REPORTING/NOTIFICATION](#)

## [RELATED PROCEDURES](#)

## [ABNORMAL OPERATING CONDITIONS](#)

### **SCOPE AND PURPOSE**

This procedure is to provide personnel with safe and effective activities to ensure the integrity of its pipeline system while performing insertion of plastic pipe through retired piping (i.e. retired steel, PVC services, etc.). It describes practices required to comply with §[192.321](#).

### **RESPONSIBILITY**

The Thomasville Utilities's designee is responsible to ensure that the renewal of a service through insertion is performed as described in this procedure.

### **PERSONNEL SAFETY** (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

Wear all required safety equipment as specified by the Company.

### **EQUIPMENT AND MATERIALS**

Necessary equipment and materials to perform the task, such as, but not limited to:

- Shovels
- Hand tools
- Maps and/or records, as needed

### **OPERATOR QUALIFICATION**

This activity is a covered task under the Operator Qualification (OQ) Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

### **INSTRUCTIONS**

**Note:** Any other covered task(s) required by this procedure may be performed by any individual qualified in the performance of the other task(s) and authorized by Thomasville Utilities to do so.

[General](#)[Procedure](#)**General**

- a. Existing services suitable for insertion may be renewed by inserting the retired pipe with plastic pipe.
- b. The use of plastic pipe is limited to the lower of the system's maximum allowable operating pressure or the materials pressure rating.
- c. Whenever a service is inserted, it is preferred that it be renewed completely with plastic pipe from the main to the meter. If the service cannot be replaced in its entirety, a detailed drawing/description shall accompany the work order or other documentation with sufficient clarity as to describe the portion(s) of existing pipe remaining in service.
- d. If mechanical joints (i.e. mechanical fittings) are used, they shall meet the requirements of §[192.281](#)(e).
- e. The practice of pipe reaming/de-burring is used to ensure that the cut ends of metallic pipe are smooth and free of any sharp protrusions that may scrape, gouge, or otherwise damage the plastic pipe being inserted. Plastic Insert Protectors (PIPs) are installed into the ends of the cut metallic pipe to prevent damage to the plastic pipe from rubbing on the edge(s) of the metallic pipe.
- f. Generally, there are three choices for "Service Risers" when performing an insert:
  - (1) Utilization of a service-head adapter on the existing metallic riser

This involves removing a portion of the service line. The length is equal to the makeup dimensions of the service-head adapter at the riser below the threads. The riser is then re-threaded to accept the service-head adapter.
  - (2) Utilization of a anodeless riser
  - (3) Fabrication and utilization of a field-fabricated riser

This involves building a service riser from appropriate size steel pipe. This is done by making a field bend in the steel pipe, reaming both ends of the pipe, threading one end of the pipe to accept the service-head adapter, installing a PIP and wrapping the pipe so that the wrap terminates above ground level.
- g. In some cases, the existing metallic riser may not be suitable (i.e. the existing riser is corroded to the point that it will not withstand the weight of the meter set or the rigors of installing a service-head adapter) for the installation of a service-head adapter. In those cases, an anodeless riser or field-fabricated riser shall be used.
- h. In those instances where services are inserted AND there is no tracer wire/tape or other means to locate the service (i.e. PVC, etc), maps and/or records shall be updated and complete showing the location(s) of these services.

**Procedure**

1. While not required, attempt to contact the customer to explain your purpose for being there.
2. Excavate the main at the service tap
3. Remove any wrap or other protective coating
4. Inspect the condition of the main and service tee connection and verify that the area is in satisfactory condition (i.e. no corrosion, etc. around the tap or service line that would prevent the use of the existing tap)
  - If the service tee or main at the service tee is in unsatisfactory condition, the service tee shall be removed or encapsulated with a weld-over and a new service tee shall be installed in a suitable location.
5. At the meter set, perform an inspection of the existing riser, paying particular attention to the riser at the soil-to-air interface (ground level) – see [General](#) above.

**Note:** This step may be omitted if the decision has been made to utilize a new anodeless riser or a field-fabricated anodeless riser. Ensure that the pipe wrap material extends to above-ground.

6. Isolate gas service from the customer's fuel line (break down the meter set).

7. Stop the flow of gas using one of the following methods:

- Using the appropriate tool shut off the flow of gas if the service tee is equipped with a mechanism to shut off the flow of gas (i.e. No-Blo tees, self-tapping tees, etc.)
- Main line valves
- Utilizing proper tapping/stopping equipment, shut-off the flow of gas at the service tee
- Tapping and stopple of the main
- Other safe and reliable methods of flow control deemed safe by Thomasville Utilities

8. At the service riser, purge gas from service line (Ref. Task [1651](#), *Purge – Flammable or Inert Gas*); remove the service valve once you have verified that all gas is purged from the service.

9. Separate service line from main at service tee as follows:

- If it is a metallic service, install bonding cables (Ref. O&M Section [13-Z\(e\)](#)) on each side of the service line so that electrical continuity is maintained when the service line is separated from the main.
- Using pipe cutters (typically 4-wheel cutters), or other safe means of cutting the pipe, cut out approximately 12 inches or more of the service line at the service tap, leaving approximately 6 inches of service line connected to the service tee.
- Once the steel service has been separated from the steel main, inspect the inside of the steel service for signs of internal corrosion.

10. Ream/de-burr the pipe and installing Plastic Insert Protectors (PIPs) as follows:

- Using pipe reamers or other means of removing any burrs, sharp edges, etc. on the inside of each cut of the existing pipe, ream/de-burr the pipe (note: during the insert, any welds in a metallic service with burn-through, etc. may prevent the insertion of the plastic. through the metallic pipe. If this happens, those welds will need to be located, cut out and pipe ends reamed/de-burred).
- Install Plastic Insert Protectors (PIPs) in the ends of all sections of metallic pipe that has been cut.

11. At the Service Riser, determine which service riser will be utilized and do the applicable installation procedure for that service riser:

*Option A:* Installing a service-head adapter on an existing riser:

- Measure the makeup of the service-head adapter (i.e. 3½ inches).
- Using a tape measure, measure down from the top of the existing service riser and mark the service riser for cutting.
- Cut the service riser and ream/de-burr the pipe.
- Re-thread riser using pipe threaders.

*Option B:* Installing an anodeless riser:

- Dig back on the existing riser far enough to accept the anodeless riser and fitting.
- Cut the existing riser and ream/de-burr the pipe (installation of the PIP can be done once the plastic pipe has been pushed through the metallic pipe).
- Consideration should be given to connecting tracer wire to the end of the metallic service (by exothermic weld or by mechanical connection) and ran aboveground for locating purposes.

*Option C:* Installing a field-fabricated anodeless riser:

- Dig back on the existing riser far enough to accept the field-fabricated riser and fitting

- Consideration should be given to connecting tracer wire to the end of the metallic service (by exothermic weld or by mechanical connection) and running it aboveground for locating purposes.

## 12. Insert the service, as follows:

The direction that the service is inserted does not have a bearing on this procedure. In most cases, PIPs shall be installed once the plastic has passed through ends of metallic pipe.

- Assist the plastic pipe slide through the pipe by doing the following, as applicable:
  - Install what is commonly called a "bullet". This is a conical-shaped device that is installed in the leading end of the plastic pipe being inserted. It is held in place by inserting the bottom end of the "bullet" and tightening the device so that the rubber end expands and locks into place inside the plastic pipe.
  - Cut a "bird's beak" into the leading edge of the plastic pipe by cutting a "V-notch" into the end of the pipe
  - Cut a diagonal piece from the leading edge of the plastic pipe so that the end of the pipe is smaller than the plastic pipe as a whole
- Uncoil the plastic pipe from its roll so that there are no kinks, twists, or bends in the pipe – note: care shall be taken with the pipe so that it is not damaged, scraped, or nicked.
- From the chosen direction, begin inserting the plastic pipe into the prepared end of the retired pipe. Continue pushing the pipe into the pipe using controlled movements so that the plastic pipe does not become kinked while pushing.
  - Should the line become kinked while pushing, remove the pipe from the retired pipe, cut out the kink, prepare the end of the plastic pipe for insertion and begin again.
  - Should the plastic pipe stop entirely, this may indicate an obstruction in the retired pipe such as weld burn-through, a mechanical fitting in the line, or a sharp bend that prevents the insertion of the plastic pipe. Do the following:
    - Before pulling the plastic pipe out of the retired pipe, mark the plastic pipe with a piece of tape, marker, or other suitable method to mark the plastic pipe.
    - Once the plastic pipe is marked, pull the plastic pipe out of the retired pipe. If the steel service has not been located, use the pipe locator to locate the retired pipe.
    - Lay the plastic pipe aboveground along the locate marks in the same direction as the insert with the marked side of the plastic pipe stopping at the approximate end of the retired pipe.
    - Dig up the spot where the beginning of the plastic pipe is in relation to the located service; cut out or remove the obstruction. Ream/de-burr the pipe ends, if metallic, install tracer wire between the removed section(s) (by exothermic weld, or by mechanical connection), allow metallic pipe to cool, if applicable, and then restart the insertion
- Once the plastic pipe has exited the retired pipe in the expected location, push enough plastic pipe past the end of the retired pipe so that a visual inspection of the plastic pipe can be performed. Check for excessive scrapes or gouges that would render the plastic pipe unserviceable.

## 13. Tie into the service riser, as follows:

Once the plastic pipe has been inserted through the retired pipe, the plastic service is now ready to be tied into the service riser and at the service tap.

- Tie into the existing metallic riser using a service-head adapter:
  - The riser has already been prepared as outlined in step 11 above. Install the service head adapter in accordance with the manufacturer's instructions
    - This will require having someone at the opposite end of the plastic pipe to hold pressure on the plastic pipe during the installation of the service-head adapter.
  - Once the service head adapter has been installed, install the service valve; leave the service valve in the "closed" or "off" position.
- Install anodeless riser as follows:
  - If the retired pipe is metallic, ensure that a PIP is installed in the end of the pipe.

- Install the anodeless riser by connecting the riser to the plastic pipe by using a mechanical connection, heat fusion, or electrofusion.
- Install the service valve on the anodeless riser; leave service valve in the "closed" or "off" position.
- Install field fabricated riser as follows:
  - Insert the plastic pipe into the field-fabricated riser and install the service-head adapter in accordance with the manufacturer's instructions.
    - This will require having someone at the opposite end of the plastic pipe to hold pressure on the plastic pipe during the installation of the service-head adapter.
  - Ensure the PIPs are installed in the end of the retired metallic service AND the end of the field-fabricated riser.
  - Install the service valve; leave service valve in the "closed" or "off" position.

#### 14. Pressure test and tie into service tap, as follows:

Once the work has been completed at the service riser, the service is ready to be pressure tested and tied into the main. The service can be pressure tested first or the excess flow valve (EFV) or manual service line shut-off valve may be installed and then pressure tested (if EFV is installed, the service should be pressure tested from the service riser toward the main).

The following describes pressure testing the service first, and then installing the EFV or manual service line shut-off valve:

- Ensure that the service valve at the service riser is in the "closed" or "off" position.
- Install pressure testing equipment on the plastic service at the tap connection.
- Pressure-test the inserted service at the correct pressure and duration – see [Appendix P-1, Pressure Test Durations](#).
- Once the pressure test is verified and no leaks identified (pressure test held at the pressure and for the duration required), bleed the compressed air from the plastic service and remove the pressure testing equipment.
- Install the excess flow valve (EFV) or manual service line shut-off valve on the plastic service as close as practical to the main utilizing a mechanical connection, heat fusion, or electrofusion.
- Tie the plastic service into the main utilizing the existing service tap by the use of a mechanical connection or by welding of a steel to plastic transition fitting,
- Introduce gas into the plastic service (dependent upon the method used to stop the flow of gas originally – See step 7 on stopping the flow of gas, above).
- Purge the air from the service line.
- Soap-test ALL fittings that were not tested during the pressure test for leaks.
- It is recommended that a pipe-to-soil reading be taken and recorded on the work order.
- Clean and wrap the metallic piping at the service tap (service tee, short section of steel service, if any, and main).
- Backfill the excavation.

### REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

### RELATED PROCEDURES

[Section 13-Z\(e\)](#) – Prevention of Accidental Ignition (§[192.751](#))

*Non-OQ Procedures:*

[05](#) - Precautions in Excavated Trenches

[06](#) - Continuing Surveillance

*OQ Procedures:*

- [0001](#) - Measure Structure-to-Electrolyte Potential
- [0041](#) - Installation and Maintenance of Mechanical Electrical Connection
- [0051](#) - Installation of Exothermic Electrical Connections
- [0141](#) - Visual Inspection for Atmospheric Corrosion
- [0151](#) - Visual Inspection of Buried Pipe and Components When Exposed
- [0161](#) - Visual Inspection for Internal Corrosion
- [0171](#) - Measure External Corrosion
- [0181](#) - Measure Internal Corrosion
- [0201](#) - Visual Inspection of Installed Pipe and Components for Mechanical Damage
- [0211](#) - Measure and Characterize Mechanical Damage on Installed Pipe and Components
- [0301](#) - Manually Opening and Closing Valves
- [0331](#) - Valve - Visual Inspection and Partial Operation
- [0341](#) - Valve - Preventive Maintenance
- [0561](#) - Pressure Test - Non-liquid Medium - Test Pressure Less than 100 psig
- [0591](#) - Leak Test at Operating Pressure
- [0641](#) - Visually Inspect Pipe and Components Prior to Installation
- [0681](#) - Joining of Plastic Pipe - Stab Fittings
- [0691](#) - Joining of Pipe - Non-Bottom Out Compression Couplings
- [0701](#) - Joining of Pipe - Bottom Out Compression Couplings
- [0711](#) - Joining of Pipe - Compression Couplings
- [0721](#) - Joining of Pipe - Threaded Joints
- [0731](#) - Joining of Pipe - Flange Assembly
- [0781](#) - Joining of Plastic Pipe - Electrofusion
- [0791](#) - Joining of Plastic Pipe - Socket Heat Fusion
- [0891](#) - Field Bending of Steel Pipe
- [0941](#) - Install Tracer Wire
- [0981](#) - Backfilling
- [0991](#) - Coating Application and Repair - Brushed or Rolled
- [1001](#) - Coating Application and Repair - Sprayed
- [1011](#) - External Coating Application and Repair - Wrapped
- [1131](#) - Stopper (Stopples) Pipe



[1291](#) - Locate Underground Facilities

[1321](#) - Damage Prevention during Excavation Activities By or On Behalf of the Operator

[1341](#) - Provide or Assure Adequate Support during Operator Initiated Excavation Activities

[1651](#) - Purge - Flammable or Inert Gas

**ABNORMAL OPERATING CONDITIONS**

| <b>AOC Main Category &amp; Examples of Specific AOCs</b>  | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| Unplanned escape of product from a pipeline <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>   | <ul style="list-style-type: none"> <li>• Protect life &amp; Property</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> <li>• Notify Fire/Emergency Responders</li> <li>• Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Use appropriate PPE</li> <li>• Stop gas flow</li> <li>• Make repairs/eliminate AOC</li> </ul> |
| Fire or Explosion <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>• Protect life &amp; Property</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> <li>• Notify Fire/Emergency Responders</li> <li>• Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Use appropriate PPE</li> <li>• Stop gas flow</li> <li>• Make repairs/eliminate AOC</li> </ul> |
| Unplanned Flow Rate Deviation <ul style="list-style-type: none"> <li>• No Flow</li> <li>• Unplanned Decrease in Flow</li> <li>• Unplanned Increase in Flow</li> </ul>                       | <ul style="list-style-type: none"> <li>• Protect life &amp; property</li> <li>• Notify appropriate personnel</li> <li>• Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate AOC</li> </ul>   |
| Unplanned Status Change <ul style="list-style-type: none"> <li>• Inoperable/Failure of a Pipeline Component</li> <li>• Stray Current on a Pipeline – Electric Shock</li> </ul>              | <ul style="list-style-type: none"> <li>• Protect life &amp; property</li> <li>• Notify appropriate personnel</li> <li>• Initiate Emergency Plan as Needed</li> </ul>  | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate AOC</li> </ul>   |
| Inadequate Odorization or Reports of Gas Odor <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul>                     | <ul style="list-style-type: none"> <li>• Protect life &amp; property</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate AOC</li> </ul>   |
| Improper Installation/Misalignment of Components <ul style="list-style-type: none"> <li>• Improper fitting/component installation</li> <li>• Misalignment of fittings/components</li> </ul> | <ul style="list-style-type: none"> <li>• Protect life &amp; property</li> <li>• Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>• Notify appropriate personnel</li> <li>• Make repairs/eliminate AOC</li> </ul>   |



# Procedure 0151 - Visual Inspection of Buried Pipe and Components When Exposed

Thomasville Utilities Operations & Maintenance Manual - Version 2022.3 - September 15, 2022

## [SCOPE AND PURPOSE](#)

## [RESPONSIBILITY](#)

## [PERSONNEL SAFETY \(Where Applicable\)](#)

## [EQUIPMENT AND MATERIALS](#)

## [OPERATOR QUALIFICATION](#)

## [INSTRUCTIONS](#)

## [REPORTING/NOTIFICATION](#)

## [RELATED PROCEDURES](#)

## [ABNORMAL OPERATING CONDITIONS](#)

### **SCOPE AND PURPOSE**

This procedure is to ensure adequate examination of existing *pipe* and components for external corrosion when exposed. It describes inspection practices required to comply with §[192.459](#).

### **RESPONSIBILITY**

Thomasville Utilities's designee is responsible to ensure that visual inspections of pipe and components are performed as described in this procedure. Activities wherein buried pipelines are exposed include, but are not limited to, tapping a pipeline, repairing a *leak*, and third party excavation near *gas* facilities.

### **PERSONNEL SAFETY (Where Applicable)**

When arriving on site, be aware of any environment or hazards that can pose a threat to personnel safety. When deemed necessary, consider Personal Protective Equipment applicable to the environment, such as gloves, eye protection, a hard hat, and/or a high visibility safety vest.

### **EQUIPMENT AND MATERIALS**

Necessary equipment and materials to perform the task include but are not limited to the following:

- System maps and records
- Routine hand tools
- Other equipment and materials as needed

### **OPERATOR QUALIFICATION**

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform visual inspection of buried pipe and components when exposed. Refer to the OQ Plan for specific qualification requirements.

### **NOTE**

**Any other covered task(s) required by this procedure may be performed by any individual qualified in the performance of the other covered task(s) and authorized by Thomasville Utilities to do so.**

**INSTRUCTIONS**

- a. Clean exposed portion of buried pipeline and components by removing soil, if applicable.
- b. Visually and physically examine pipeline and components for evidence of external corrosion.
  - i. The National Association of Corrosion Engineers International (NACE) defines corrosion as “the deterioration of a material, usually a metal, which results from a reaction with its environment”. When corrosion occurs on a pipeline, there is visual metal loss (pitting) along the pipeline (see sample pictures below).



- c. If the pipe is coated, visually inspect the condition of the coating, checking for areas where the coating has become disbonded from the pipe or is missing.
- d. If no corrosion is found, further investigation is not required.
- e. If external corrosion requiring remedial action is found, an investigation shall be performed both circumferentially around the pipe and longitudinally along the pipe beyond the exposed portion to determine whether additional corrosion requiring remedial action exists. (See O&M [Procedure 0171 - Measure External Corrosion](#)). External corrosion is categorized as either:
  - i. General Corrosion - Corrosion that is found along the entire segment of pipeline exposed (e.g., a service tap is exposed with the protective coating missing and the entire area exposed shows evidence of corrosion)
  - ii. Localized Corrosion - Corrosion that is found in a small area of the exposed pipeline (e.g., a *main* is exposed and corrosion is found on a small segment where the protective coating may be missing).
- f. Remedial action shall be taken in accordance with the Operation and Maintenance Manual.

**REPORTING/NOTIFICATION**

Complete documentation in accordance with the Operation and Maintenance Manual including collection of any additional information identified as needed for the Distribution Integrity Management Plan.

**RELATED PROCEDURES**

|                           |   |
|---------------------------|---|
| <a href="#">0171-0191</a> | Measure External and Atmospheric Corrosion  |
| <a href="#">05</a>        | Precautions in Excavated Trenches           |
| <a href="#">13-Z</a>      | Prevention of Accidental Ignition - 192.751 |

**ABNORMAL OPERATING CONDITIONS**

| AOC Main Category & Examples of Specific AOCs  | Reactions to AOC, as appropriate   |  |
|--|--|--|
| <p><b><i>Unplanned escape of product from a pipeline</i></b></p> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul> | <ul style="list-style-type: none"> <li>• Protect life, property, and the environment</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> </ul> | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Use appropriate PPE</li> <li>• Stop gas flow</li> </ul> |

|   |   |  |
|---|---|--|
|   | <ul style="list-style-type: none"> <li>Notify Fire/Emergency Responders</li> <li>Initiate Emergency Plan</li> </ul>   | <ul style="list-style-type: none"> <li>Make repairs/eliminate AOC</li> </ul>   |
| <p><b>Fire or Explosion</b></p> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>   | <ul style="list-style-type: none"> <li>Protect life, property, and the environment</li> <li>Prevent accidental ignition</li> <li>Notify appropriate personnel</li> <li>Notify Fire/Emergency Responders</li> <li>Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Use appropriate PPE</li> <li>Stop gas flow</li> <li>Make repairs/eliminate AOC</li> </ul> |
| <p><b>Unplanned Status Change</b></p> <ul style="list-style-type: none"> <li>Stray Current on a pipeline – Electric Shock</li> </ul>  | <ul style="list-style-type: none"> <li>Protect life, property, and the environment</li> <li>Prevent accidental ignition</li> <li>Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Make repairs/eliminate AOC</li> </ul>   |
| <p><b>Pipeline Damage</b></p> <ul style="list-style-type: none"> <li>Coating Damage</li> <li>Corrosion Damage</li> <li>Dents, Gouges, Defects, Scrapes, etc.</li> </ul>         | <ul style="list-style-type: none"> <li>Protect life, property, and the environment</li> <li>Prevent accidental ignition</li> <li>Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Make repairs/eliminate AOC</li> </ul>   |
| <p><b>Inadequate Odorization or Reports of Gas Odor</b></p> <ul style="list-style-type: none"> <li>Low odorization</li> <li>Over odorization</li> <li>Odor complaint</li> </ul> | <ul style="list-style-type: none"> <li>Protect life, property, and the environment</li> <li>Prevent accidental ignition</li> <li>Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Make repairs/eliminate AOC</li> </ul>   |

[Procedure 0151 Version 2.4 Revision Date 07/12/2022]

# Procedure 0201 - Visual Inspection of Pipe and Components for Mechanical Damage

Thomasville Utilities Operations & Maintenance Manual - Version 2022.3 - September 15, 2022

## [SCOPE AND PURPOSE](#)

## [RESPONSIBILITY](#)

## [PERSONNEL SAFETY \(Where Applicable\)](#)

## [EQUIPMENT AND MATERIALS](#)

## [OPERATOR QUALIFICATION](#)

## [INSTRUCTIONS](#)

## [REPORTING/NOTIFICATION](#)

## [RELATED PROCEDURES](#)

## [ABNORMAL OPERATING CONDITIONS](#)

### **SCOPE AND PURPOSE**

This procedure is to ensure visual inspection is performed on installed *pipe* and components for the purpose of detecting mechanical damage.

### **RESPONSIBILITY**

Thomasville Utilities's designee is responsible to ensure that visual inspections of pipe and components are performed as described in this procedure.

### **PERSONNEL SAFETY (Where Applicable)**

Appropriate PPE shall be worn when applicable. When arriving at the location, be aware of any environment that can pose a threat to personnel safety.

### **EQUIPMENT AND MATERIALS**

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Routine hand tools
- Other equipment and materials as needed

### **OPERATOR QUALIFICATION**

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform visual inspection of buried pipe and components when exposed. Refer to the OQ Plan for specific qualification requirements.

### **NOTE**

Any other covered task(s) required by this procedure may be performed by any individual qualified in the performance of the other covered task(s) and authorized by Thomasville Utilities to do so.

Procedure 0201 - Visual Inspection of Pipe and Components for Mechanical Damage

## INSTRUCTIONS

- a. Clean exposed portion of buried pipeline and components by removing soil, if applicable.
- b. Visually and physically examine pipe and pipeline components for evidence of visually determinable damage and defects that could impair its serviceability such as dents, gouges, cracks, or defects
- c. If the pipe is coated, visually inspect the condition of the coating, checking for areas where the coating has become disbonded from the pipe or is missing.
- d. If mechanical damage or defects is found during visual inspection, an investigation shall be performed both circumferentially around the pipe and longitudinally along the pipe to determine whether additional mechanical damage or defects exist (see [Related Procedures](#) section).
  - i. Mechanical defects that are not removed/repared shall be measured and characterized (see Procedure #0211). The measurements shall be analyzed by an engineer or other appropriate personnel to determine the remedial action(s) needed.
- e. Remedial action shall be taken in accordance with Thomasville Utilities's Operation and Maintenance Manual.

## REPORTING/NOTIFICATION

Complete documentation in accordance with the Operation and Maintenance Manual including collection of any additional information identified as needed for the Distribution Integrity Management Plan.

## RELATED PROCEDURES

|                           |   |
|---------------------------|---|
| <a href="#">0211</a>      | Measure and Characterize Mechanical Damage on Installed Pipe and Components   |
| <a href="#">1321-1341</a> | Damage Prevention During Excavation Activities By or On Behalf of the Operator and to Provide or Assure Adequate Pipeline Support During Operator Initiated Excavation Activities |
| <a href="#">1331</a>      | Damage Prevention During Inspection During Third-Party Excavation or Encroachment Activities as Determined Necessary by Operator  |

## ABNORMAL OPERATING CONDITIONS

| <b>AOC <i>Main</i> Category &amp; Examples of Specific AOCs</b>   | <b>Reactions to AOC, as appropriate</b>   |  |
|---|---|--|
| <p><b><i>Unplanned escape of product from a pipeline</i></b></p> <ul style="list-style-type: none"> <li>• Blowing/Escaping <i>gas</i>/Grade I <i>leak</i></li> </ul>                      | <ul style="list-style-type: none"> <li>• Protect life, property, and the environment</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> <li>• Notify Fire/Emergency Responders</li> <li>• Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Use appropriate PPE</li> <li>• Stop gas flow</li> <li>• Make repairs/eliminate AOC</li> </ul> |
| <p><b><i>Fire or Explosion</i></b></p> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>• Protect life, property, and the environment</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> <li>• Notify Fire/Emergency Responders</li> <li>• Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Use appropriate PPE</li> <li>• Stop gas flow</li> <li>• Make repairs/eliminate AOC</li> </ul> |
| <p><b><i>Unplanned Status Change</i></b></p> <ul style="list-style-type: none"> <li>• Stray Current on a pipeline - Electric Shock</li> <li>• Inoperable/Failure of a Pipeline</li> </ul> | <ul style="list-style-type: none"> <li>• Protect life, property, and the environment</li> <li>• Prevent accidental ignition</li> </ul>  | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate</li> </ul>   |

|   |  |  |
|---|--|--|
| <p><b>Pipeline Damage</b></p> <ul style="list-style-type: none"> <li>• Coating Damage</li> <li>• Corrosion Damage</li> <li>• Dents, Gouges, Defects, Scrapes, etc.</li> </ul>         | <ul style="list-style-type: none"> <li>• Protect life, property, and the environment</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> </ul> | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate AOC</li> </ul> |
| <p><b>Inadequate Odorization or Reports of Gas Odor</b></p> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization</li> <li>• Odor complaint</li> </ul> | <ul style="list-style-type: none"> <li>• Protect life, property, and the environment</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> </ul> | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate AOC</li> </ul> |

[Procedure 0201 Version 2.4 Revision Date 07/13/2022]



# Procedure 0641 - Visually Inspect Pipe and Components Prior to Installation

Thomasville Utilities Operations & Maintenance Manual - Version 2022.3 - September 15, 2022

## [SCOPE AND PURPOSE](#)

## [RESPONSIBILITY](#)

## [PERSONNEL SAFETY \(Where Applicable\)](#)

## [EQUIPMENT AND MATERIALS](#)

## [OPERATOR QUALIFICATION](#)

## [INSTRUCTIONS](#)

## [REPORTING/NOTIFICATION](#)

## [RELATED PROCEDURES](#)

## [ABNORMAL OPERATING CONDITIONS](#)

### **SCOPE AND PURPOSE**

This procedure is to ensure visual inspection of *pipe* and pipeline components prior to installation to identify visually determinable damage and defects that could impair its serviceability as required to comply with [§192.307](#).

### **RESPONSIBILITY**

Thomasville Utilities's designee is responsible to ensure that visual inspections of pipe and components are performed as described in this procedure.

### **PERSONNEL SAFETY (Where Applicable)**

Appropriate PPE shall be worn when applicable. When arriving at the location, be aware of any environment that can pose a threat to personnel safety.

### **EQUIPMENT AND MATERIALS**

Necessary equipment and materials to perform the task, such as, but not limited to:

- System maps and records
- Routine hand tools
- Other equipment and materials as needed

### **OPERATOR QUALIFICATION**

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform visual inspection of buried pipe and components when exposed. Refer to the OQ Plan for specific qualification requirements.

### **NOTE**

**Any other covered task(s) required by this procedure may be performed by any individual qualified in the performance of the other covered task(s) and authorized by Thomasville Utilities to do so.**

### **INSTRUCTIONS**

- a. Visually and physically examine pipe and pipeline components for evidence of visually determinable damage and defects that could impair serviceability such as dents, gouges, cracks, or defects.
  - i. Unless otherwise approved by an engineer, any dent, gouge, crack or other defect discovered on pipe and pipeline components prior to installation shall be removed/replaced prior to placing the segment into service.
- b. If the pipe is coated, visually inspect the condition of the coating, checking for areas where the coating has become disbonded from the pipe or is missing.
  - i. Coating that has become disbonded or is missing shall be repaired (see "Related Procedures" section).
- c. Pipe or pipeline components that do not pass visual inspection shall be repaired or removed and replaced before installation.
- d. Other remedial action shall be taken in accordance with Operation and Maintenance Manual.

## REPORTING/NOTIFICATION

Complete documentation in accordance with the Operation and Maintenance Manual including collection of any additional information identified as needed for the Distribution Integrity Management Plan.

## RELATED PROCEDURES

|                      |  |
|----------------------|--|
| <a href="#">0991</a> | Coating Application and Repair - Brushed or Rolled |
| <a href="#">1001</a> | Coating Application and Repair - Sprayed           |
| <a href="#">1011</a> | External Coating Application & Repair - Wrapped    |

## ABNORMAL OPERATING CONDITIONS

| AOC Main Category & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|--|---|--|
| <p><b>Unplanned escape of product from a pipeline</b></p> <ul style="list-style-type: none"> <li>Blowing/Escaping <i>gas</i>/Grade I <i>leak</i></li> </ul>                              | <ul style="list-style-type: none"> <li>Protect life, property, and the environment</li> <li>Prevent accidental ignition</li> <li>Notify appropriate personnel</li> <li>Notify Fire/Emergency Responders</li> <li>Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Use appropriate PPE</li> <li>Stop gas flow</li> <li>Make repairs/eliminate AOC</li> </ul> |
| <p><b>Fire or Explosion</b></p> <ul style="list-style-type: none"> <li>Fire on a pipeline</li> <li>Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>Protect life, property, and the environment</li> <li>Prevent accidental ignition</li> <li>Notify appropriate personnel</li> <li>Notify Fire/Emergency Responders</li> <li>Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Use appropriate PPE</li> <li>Stop gas flow</li> <li>Make repairs/eliminate AOC</li> </ul> |
| <p><b>Unplanned Status Change</b></p> <ul style="list-style-type: none"> <li>Stray Current on a pipeline - Electric Shock</li> <li>Inoperable/Failure of a Pipeline Component</li> </ul> | <ul style="list-style-type: none"> <li>Protect life, property, and the environment</li> <li>Prevent accidental ignition</li> <li>Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Make repairs/eliminate AOC</li> </ul>   |
| <p><b>Pipeline Damage</b></p> <ul style="list-style-type: none"> <li>Coating Damage</li> <li>Corrosion Damage</li> <li>Dents, Gouges, Defects, Scrapes, etc.</li> </ul>                  | <ul style="list-style-type: none"> <li>Protect life, property, and the environment</li> <li>Prevent accidental ignition</li> <li>Notify appropriate personnel</li> </ul>  | <ul style="list-style-type: none"> <li>Locate source/cause of AOC</li> <li>Make repairs/eliminate</li> </ul>   |

|   |  |   |
|---|--|---|
| <p><b>Inadequate Odorization or Reports of Gas Odor</b></p> <ul style="list-style-type: none"><li>• Low odorization</li><li>• Over odorization</li><li>• Odor complaint</li></ul> | <ul style="list-style-type: none"><li>• Protect life, property, and the environment</li><li>• Prevent accidental ignition</li><li>• Notify appropriate personnel</li></ul> | <ul style="list-style-type: none"><li>• Locate source/cause of AOC</li><li>• Make repairs/eliminate AOC</li></ul> |
|---|--|---|

*[Procedure 0641 Version 2.4 Revision Date 07/12/2022]*

# OQ Procedure 1651 - Purge – Flammable or Inert Gas

Thomasville Utilities Operations & Maintenance Manual - Version 2022.3 - September 15, 2022

## [SCOPE AND PURPOSE](#)

## [RESPONSIBILITY](#)

## [PERSONNEL SAFETY \(Where Applicable\)](#)

## [EQUIPMENT AND MATERIALS](#)

## [OPERATOR QUALIFICATION](#)

## [GENERAL](#)

## [INSTRUCTIONS](#)

## [REPORTING/NOTIFICATION](#)

## [RELATED PROCEDURES](#)

## [ABNORMAL OPERATING CONDITIONS](#)

### **SCOPE AND PURPOSE**

This procedure is to provide personnel with the necessary procedures for performing purging with gas, air, or inert gas as required by [§192.629](#).

### **RESPONSIBILITY**

Thomasville Utilities's designee is responsible to ensure that purging with gas, air, or inert gas is performed as described in this procedure.

### **PERSONNEL SAFETY (Where Applicable)**

- Personnel shall not perform purging operations until ignition and potential ignition sources are eliminated.
- Prior to the beginning of a purging operation, appropriate notifications shall be given to local public officials and the public in the vicinity of the purging operation if:
  - It is anticipated the release of gas/air may disturb normal traffic flow; and/or
  - It is anticipated that there may be calls from the public regarding the purging operation; and/or
  - It is anticipated that the public may be affected by the purging process by things such as:
    - High Noise Level
    - Strong Odor
    - Possibility of Accidental Ignition
- Whenever purging operations are in progress, a fire extinguisher must be present at the purging site at a suitable location.
- The discharge mechanism (purge stack) that is used to purge the gas/air must be metal (steel, copper, stainless steel, etc.) and an electrical ground applied so that the potential for static electricity is minimized – static electricity can be created by the friction of the gas/air molecules on the *pipe* walls. Plastic pipe is susceptible to static electricity buildup, especially at the ends of pipe.
- When purging larger diameter pipe, such as 2-inch diameter and larger where a large volume of gas/air is to be purged, the discharge mechanism should be smaller in diameter than the pipeline being purged.

Procedure 1651 - Purge – Flammable or Inert Gas

- As a general rule, the discharge mechanism should not be larger than one-half the diameter of the pipeline being purged. This smaller diameter should help increase velocity of the gas passing through the discharge apparatus and may prevent flashback should the venting gas ignite.
- The discharge mechanism should extend high enough to expel the vented gas/air away from personnel and potential ignition sources.
- Prior to beginning a purging operation, a suitable location shall be chosen to reduce the risk to life, property, and the environment.
  - Particular consideration should be taken to avoid purging directly under or into power lines.
- If isolation is attainable, each segment of steel pipe that is being purged will be completely isolated from any induced *cathodic protection* systems (rectifiers).
- Precautions shall be taken during purge venting to contain any solid debris, dust, or residue that may accumulate in piping during construction and that may be a hazard or create a public nuisance. These precautions may include the point of vent discharge being located away from structures or personal property, isolation of the purge site, workers being sheltered, or other means found necessary by the *Operator*. Also, precautions shall be taken for flammable liquids that may be present in piping such as oils, liquid condensates, etc. If only a small volume of liquid is suspected, that *will not* interfere with achieving purge, purging may proceed. If larger amounts of liquid are suspected, actions must be taken to remove the liquids. These actions may include pigging, air or inert gas blows, or other actions approved by the Operator.

**Note: Although flammable liquids may be removed from a pipeline and the purge achieved, caution should be exercised prior to conducting any hot work as the pipe's interior surface may ignite from oily residue. The Operator should consider options such as interior surface cleaning using a suitable solvent prior to conducting hot work. The interior surfaces should be "wipe tested" to ensure surface residue will not support ignition.**

- Ensure that a means of adequate communication is available and established for purging operations where the purge stack location and the means for controlling the release of the air, gas, or inert gas is not in the same vicinity so that the flow may be halted in the event of an emergency.
- Suitable personal protective equipment shall be used by personnel commensurate with the purging operation. Example(s):
  - Flame Retardant Clothing
  - Eye Protection
  - Hearing Protection
  - Hand Protection
  - Other as Needed

## EQUIPMENT AND MATERIALS

Necessary equipment and materials to perform the task, such as, but not limited to:

- Combustible Gas Indicator (CGI)
- Bonding Cable
- Discharge Mechanism (Riser)
- Adapter Fitting(s)
- Inert Gas (As Needed)
- Air Compressor (As Needed)
- Other Equipment and Materials as Needed

## OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform purging of a pipeline of air, gas, or inert gas. Refer to the OQ Plan for specific qualification requirements.

## GENERAL

- Purging is the process of displacing gas/air within a pipeline or pipeline section with natural gas, air, or an inert gas.
- Purging a pipeline of air with gas is required:
  - Whenever a pipeline or pipeline section is newly installed
  - Whenever a pipeline or pipeline section has been removed from service and is being re-activated
- Purging a pipeline of gas with air is required:
  - Whenever a pipeline or pipeline section is to be *abandoned* or the pressure is removed for maintenance, etc.
  - However, the pipeline need not be purged when the volume of gas is so small that there is no potential hazard.
- Purging a pipeline with an inert gas is required:
  - If gas cannot be supplied in a sufficient quantity to prevent the formation of a hazardous mixture of gas in air, a slug of inert gas should be released into the line before the gas.
  - If air cannot be supplied in sufficient quantity to prevent the formation of a hazardous mixture of gas and air, a slug of inert gas should be released into the line before the air.
- A combustible gas indicator (CGI) is the preferred method of verifying that the pipeline or pipeline section has been completely purged.

## INSTRUCTIONS

**Note: Any other covered task required by this procedure may be performed by any individual Qualified in the performance of the other task and authorized by Thomasville Utilities to do so.**

[Purging of Gas with Air or Inert Gas \(Blow-down\)](#)

[Purging of Air with Gas or Inert Gas \(Start-Up or Re-Commissioning\)](#)

### **Purging of Gas with Air or Inert Gas (Blow-down)**

1. Determine the location for the purging operation.
2. Ensure that all potential ignition sources are removed and secure the area where the purging operation will take place.
3. Determine if notification(s) to public officials and/or the public is needed.
4. Ensure that fire extinguisher(s) and other appropriate personal protective equipment is available and in use, as needed.
5. Determine if a purge stack will need to be installed or if service risers or other already installed piping may be used as a purge stack for the purging operation.
6. Isolate the pipeline section to be purged (e.g. Squeeze-Offs - for plastic pipe: see Procedure # [1141](#) - for steel pipe see Procedure # [1151](#)), Valves (Procedure # [0301](#)), Control Fittings, etc.).

**Note:** If squeezing plastic pipe (Procedure # [1141](#)), ensure that the squeeze-off tool is grounded.

7. Install purge stack, if needed (see step 5 above).
8. Ensure that all purge stacks are grounded by attaching a grounding cable to the stack on one end and attaching the other end to a ground rod driven into the ground.

**Note:** If purging plastic pipelines, to help reduce the risk of a static electricity discharge, consideration should also be given to applying soapy-water soaked burlap strips/rags or other suitable conductive material around the area of the end of the plastic pipeline and grounded by the use of a ground cable and ground rods.

9. Verify that the purge stack is of sufficient height to expel the vented gas/air away from personnel and potential ignition sources.

10. Open the valve (Procedure #0301) or other mechanism that will release the gas through the purge stack in a moderately rapid continuous flow.
11. Once the gas has finished relieving, test the opening of the purge stack with a CGI to confirm that the atmosphere is well below the lower explosive limit *L.E.L.* of the gas being purged – *squeeze-off tools may not provide a 100% squeeze-off – care should be exercised in this situation.*
12. Disconnect the pipeline section that has been recently purged from the source of gas.

**Note:** *When disconnecting steel pipelines, consideration shall be given to the use of bonding cables to bond across the area of separation to help prevent arcing.*

13. Prepare the disconnected end of the pipeline segment to accept air from a compressor or other suitable means.

**Note:** *For small purging operations such as, but not limited to, blow-down of small sections of **service line** or **main**, further purging with air may not be necessary if the volume of gas is so small that it poses not potential hazard to life or property – if in doubt, purge with additional air.*

14. Using an air compressor or other suitable means, introduce air into the previously purged pipeline segment in a moderately rapid continuous flow – **if air cannot be introduced in a moderately rapid continuous flow, a slug of inert gas shall be introduced into the pipeline before the air.**
15. Obtain readings with a CGI to verify that the atmosphere is well below the L.E.L of the gas being purged – continue purging until this is achieved.
16. At the conclusion of the purging operation, remove the purge stack and related equipment, if any (see step 5 above).

#### **Purging of Air with Gas or Inert Gas (Start-Up or Re-Commissioning)**

1. Determine the location for the purging operation.
2. Ensure that all potential ignition sources are removed and secure the area where the purging operation will take place.
3. Determine if notification(s) to public officials and/or the public is needed.
4. Ensure that fire extinguisher(s) and other appropriate personal protective equipment is available and in use, as needed.
5. Determine if a purge stack will need to be installed or if service risers or other already installed piping may be used as a purge stack for the purging operation.
6. Install purge stack, if needed (see step 5 above).
7. Ensure that all purge stacks are grounded by attaching a grounding cable to the stack on one end and attaching the other end to a ground rod driven into the ground.

If purging plastic pipelines, to help reduce the risk of a static electricity discharge, consideration should also be given to applying soapy-water soaked burlap strips/rags or other suitable conductive material around the area of the end of the plastic pipeline and grounded by the use of a ground cable and ground rods.

8. Verify that the purge stack is of sufficient height to expel the vented gas/air away from personnel and potential ignition sources.
9. Open the valve (Procedure #0301) or other mechanism that will release the gas into the pipeline and force the air in the pipeline out through the purge stack in a moderately rapid continuous flow – **if the gas cannot be introduced in a moderately rapid continuous flow, a slug of inert gas shall be introduced into the pipeline before the gas.**
10. Periodically obtain CGI readings at the end of the purge stack – continue purging until 95% gas reading or higher is obtained on the CGI.

- **Note:** *Purging of air with gas will end as soon as practicable.*

- **Note:** when purging large sections of newly installed pipelines, the odorant in the gas may be absorbed in the pipe walls – this may result in the gas being purged to exhibit an un-odorized or a lack of odorant condition – DO NOT RELY ON YOUR SENSE OF SMELL TO DETERMINE IF ALL OF THE AIR IS PURGED FROM THE PIPELINE.
- **Note:** for small sections of service line or main that would not introduce a significant amount of air into the gas stream and therefore would not pose a hazard, purging may not be necessary – if in doubt, purge the air out of the pipeline.

11. Once a 95% gas reading or higher is obtained, close the valve or other mechanism at the purge stack.

12. At the conclusion of the purging operation, remove the purge stack and related equipment, if any (see step 5 above).

**REPORTING/NOTIFICATION**

Complete documentation in accordance with Operation and Maintenance Manual.

**RELATED PROCEDURES**

Operations & Maintenance Manual Section [13-Z](#) - Prevention of Accidental Ignition (§[192.751](#))

- [0301](#) Manually Opening and Closing Valves
- [1141](#) Squeeze Off Plastic Pipe
- [1151](#) Squeeze Off Steel Pipe
- [05](#) Precautions in Excavated Trenches
- [06](#) Continuing Surveillance

**ABNORMAL OPERATING CONDITIONS**

| AOC Main Category & Examples of Specific AOCs  | Reactions to AOC, as appropriate  |  |
|--|---|--|
| <p><b>Unplanned escape of product from a pipeline</b></p> <ul style="list-style-type: none"> <li>• Blowing/Escaping gas/Grade I leak</li> </ul>  | <ul style="list-style-type: none"> <li>• Protect life &amp; Property</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> <li>• Notify Fire/Emergency Responders</li> <li>• Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Use appropriate PPE</li> <li>• Stop gas flow</li> <li>• Make repairs/eliminate AOC</li> </ul> |
| <p><b>Fire or Explosion</b></p> <ul style="list-style-type: none"> <li>• Fire on a pipeline</li> <li>• Explosion</li> </ul>  | <ul style="list-style-type: none"> <li>• Protect life &amp; Property</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> <li>• Notify Fire/Emergency Responders</li> <li>• Initiate Emergency Plan</li> </ul> | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Use appropriate PPE</li> <li>• Stop gas flow</li> <li>• Make repairs/eliminate AOC</li> </ul> |
| <p><b>Unplanned Pressure Deviation</b></p> <ul style="list-style-type: none"> <li>• Unplanned Decrease in Pressure &amp; or No Press.</li> <li>• Unplanned Increase in Pressure</li> </ul> | <ul style="list-style-type: none"> <li>• Protect life &amp; Property</li> <li>• Notify appropriate personnel</li> <li>• Initiate Emergency Plan as needed</li> </ul>  | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate AOC</li> </ul>   |
| <p><b>Unplanned Flow Rate Deviation</b></p> <ul style="list-style-type: none"> <li>• Unplanned Increase in Flow</li> </ul>   | <ul style="list-style-type: none"> <li>• Protect life &amp; Property</li> <li>• Notify appropriate</li> </ul>   | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> </ul>   |



|  |  |  |
|--|--|--|
| <ul style="list-style-type: none"> <li>• Unplanned Decrease in Flow &amp; or No Flow</li> </ul>  | <ul style="list-style-type: none"> <li>• Initiate Emergency Plan as needed</li> </ul>  | <ul style="list-style-type: none"> <li>• Make repairs/eliminate AOC</li> </ul>                                       |
| <p><b>Unplanned Status Change</b></p> <ul style="list-style-type: none"> <li>• Inoperable/failure of a pipeline component</li> <li>• Stray current on a pipeline - Electric Shock</li> </ul> | <ul style="list-style-type: none"> <li>• Protect life &amp; property</li> <li>• Notify appropriate personnel</li> <li>• Initiate Emergency Plan as needed</li> </ul> | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate AOC</li> </ul> |
| <p><b>Inadequate Odorization or Reports of Gas Odor</b></p> <ul style="list-style-type: none"> <li>• Low odorization</li> <li>• Over odorization &amp; or Odor complaint</li> </ul>          | <ul style="list-style-type: none"> <li>• Protect life &amp; property</li> <li>• Prevent accidental ignition</li> <li>• Notify appropriate personnel</li> </ul>       | <ul style="list-style-type: none"> <li>• Locate source/cause of AOC</li> <li>• Make repairs/eliminate AOC</li> </ul> |

[Procedure 1651 Version 2.5 Revision Date 9/1/22]