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O&M Section # 12.6	SCUD Task # 180
Section: Construction/Operations	Revision Date: 09/06/16

Purging with Gas, Air, or Inert Gas

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

The Construction Manager, Service Line Supervisor, Underground Maintenance Manager, or other 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 and the scene is secure from the public.
- 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 or the fire department must be present at the purging site at a suitable location.
- A CGI must be used to monitor the discharge and purging area. If the gas level reaches 2% gas in air in the purging area, purging must stop until the gas level drops well below 2%.
- 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 the pipe.
- The discharge opening must be smaller than the pipe or stack being purged. (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.
- 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

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- Hearing Protection
- Hand Protection
- Other as Needed

EQUIPMENT AND MATERIALS

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

Purging out Gas with Air or Inert Gas (Blow-down)

- a. Determine the location for the purging operation.
- b. Ensure that all potential ignition sources are removed and secure the area where the purging operation will take place.
- c. Determine if notification(s) to public officials and/or the public is needed.
- d. Ensure that fire extinguisher(s) and other appropriate personal protective equipment is available and in use, as needed.

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- e. 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.
- f. Isolate the pipeline section to be purged (Ex: Squeeze-Offs, Valves, Control Fittings, etc.). **Note:** *If squeezing plastic pipe, ensure that the squeeze-off tool is grounded.*
- g. Install purge stack, if needed and ground it. (see “e”).
- h. 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.
 - i. To help reduce the risk of a static electricity discharge if purging plastic pipelines, consideration should also be given to applying aerosol static suppressor to the area of the end of the plastic pipeline.
- i. Verify that the purge stack is of sufficient height to expel the vented gas/air away from personnel and potential ignition sources.
- j. Open the valve or other mechanism that will release the gas through the purge stack in a moderately rapid continuous flow, until the pressure stops.
- k. Once the gas pressure has finished relieving, test the opening of the purge stack with a CGI to confirm that the atmosphere is consistently well below the lower explosive limit L.E.L. (4%) of the gas being purged – *squeeze-off tools may not provide a 100% squeeze-off – care should be exercised in this situation.*
- l. Disconnect the pipeline section that has been recently purged from the source of gas.
 - i. **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.*
- m. Prepare the disconnected end of the pipeline segment to accept air from a compressor or other suitable means.
 - i. **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.*
- n. 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.***
- o. Obtain readings with a CGI to verify that the atmosphere above the purge stack is consistently well below the L.E.L (4%) of the gas being purged(preferably 0%) – continue purging until this is achieved.
- p. At the conclusion of the purging operation, remove the purge stack and related equipment, if any (see “e”).

Purging out Air with Gas or Inert Gas (Start-Up or Re-Commissioning)

- a. Determine the location for the purging operation.
- b. Ensure that all potential ignition sources are removed and secure the area where the purging operation will take place.
- c. Determine if notification(s) to public officials and/or the public is needed.
- d. Ensure that fire extinguisher(s) and other appropriate personal protective equipment is available and in use, as needed.
- e. 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.
- f. Install purge stack, if needed and ground it. (see “e”).

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- g. 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.
 - i. To help reduce the risk of a static electricity discharge if purging plastic pipelines, consideration should also be given to applying aerosol static suppressor to the area of the end of the plastic pipeline.
- h. Verify that the purge stack is of sufficient height to expel the vented gas/air away from personnel and potential ignition sources.
- i. Open the valve 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.**
- j. Periodically obtain CGI readings at the end of the purge stack – continue purging until consistently reading near 100% gas on the CGI.
 - **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.
- k. Once a sustained reading close to 100% gas is obtained above the purge stack, close the valve or other mechanism at the purge stack.
- l. At the conclusion of the purging operation, remove the purge stack and related equipment, if any (see “e”).

REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

RELATED PROCEDURES

None