



Description This procedure was designed to develop safety practices to protect personnel from the hazards of unsafe accumulations of vapors or gas when working in excavated trenches.

Regulatory Applicability

- Regulated Transmission Pipelines
- Regulated Gathering Pipelines (Type A)
- Regulated Gathering Pipelines (Type B)
- Regulated Distribution Pipelines

Frequency As required for excavation

Reference 49 CFR 192.605(b)(9)*Procedural Manual for Operations, Maintenance and Emergencies*
OSHA regulation 29 CFR 1926.650 Subpart P

Forms / Record Retention None

Related Specifications None

OQ Covered Task None



Procedure Steps

1. Ensure that communications between personnel in the trench and on the ground are possible.
2. Ensure excavated or other materials are at least 2 feet from the edge of the trench. Surface encumbrances (trees, boulders, etc.) that may create a hazard to employees involved in excavation work need to be removed or secured.
3. Determine if a confined space entry permit is required. If so, ensure all applicable work is covered by the permit.
4. Prior to beginning work in the trench and on a periodic basis while work is being performed, test for an oxygen deficient atmosphere containing less than 19.5% oxygen and unsafe accumulations of vapor (concentration of flammable gas in excess of 20% of the lower flammable limit (LEL) of the gas) or gas. Use SCBA as appropriate.
5. Minimize water accumulation in trenches as necessary. This may be done with diversion ditches, dikes, or other suitable means.
6. Use devices such as stop logs or chocks to prevent mobile equipment from accidentally entering the excavation. When possible, the grade in such areas will slope away from the excavation.
7. Provide an exit such as a sloped cut-out, ladder or steps in trenches that are 4 feet deep or more. These should be located so that no more than 25 feet of lateral travel is required [See OSHA 1926.651(c)(2)]. Provide rescue harnesses and lines as appropriate.
8. When performing rock excavation, use either a jackhammer or a hydro-hammer to remove rock from under the pipe. Explosives may be used if the ditch is new or if the line in the ditch is not loaded. Explosives will only be used under the approval of the Manager of Engineering. For further information and guidelines on using explosives, refer to OSHA 1926.650, Subpart U.
9. Shore, lay back to a stable slope, or provide some other equivalent means of protection where personnel may be exposed to moving ground or cave-ins when the trench is more than 5 feet deep. This protection will also be provided in trenches less than 5 feet deep if soil conditions so dictate. Refer to the diagram on the next page as a guide in sloping banks. Trenches will be shored as follows:
 - a) Unstable or Soft Soil - (5 feet or more in depth)

Sides of the trench will be shored, sheeted, braced, sloped, or otherwise supported by means of sufficient strength to protect the personnel working with them.
 - b) Hard or Compact Shell - (5 feet or more in depth and 8 or more feet in length)

Sides of trenches will be shored or otherwise supported. In lieu of shoring, the sides of the trench above the 4-foot level may be sloped to preclude collapse, but will not be any steeper than a 1-foot rise per each ½ foot horizontal.
 - c) Shoring Materials - Materials used for sheeting and sheet piling, bracing, shoring, and underpinning should be in good serviceable condition. Timbers used will be sound and free from large or loose knots and will be designed and installed to be effective to the bottom of the excavation.

10. Clear the surface of the slope of boulders, stumps, or other hard masses of earth that could roll or slide into the open excavation and endanger personnel below.
11. Keep the slope well packed at all times and at the angles described in the figure on the last page of this procedure.
12. Where hazardous atmospheric conditions exist or may reasonably be expected to develop, emergency rescue equipment, (i.e. breathing apparatus, safety harness and lifeline, basket stretcher, etc.), must be readily available and attended when in use.
13. Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, must wear a harness with a lifeline securely attached to it. The lifeline must be separate from any other line used to handle material and must be individually attended at all times.
14. If leaving the trench unattended, be sure to properly secure the area. This may be done with barbed wire fences, wooden stockade barriers or steel sheet piles.

Approximate Angle of Repose for Sloping of Sides of Excavations

NOTE: Clays, silts, loams, or non-homogenous soils require shoring and bracing. The presence of ground water requires special treatment.

