

Cross Bores Best Practices

To enhance gas-system safety, a Cross Bore Best Practices Guide was developed to assist operators in addressing cross bores and/or improving the efficiency of existing practices.



Project Description

Cross bores have become an industry concern because of incidents involving natural gas mains and services that were installed using trenchless technology that inadvertently transected a sewer line or private septic system. Typical sewer-cleaning operations use a device that can pierce the gas line, resulting in the rapid release of gas.

Whereas some gas utilities have begun thorough programs to inspect past trenchless pipe installations to ensure cross bores have not occurred, other operators have not started such a program or are in the early stages of development.

To assist utilities in addressing cross-bore safety issues, a Cross Bore Best Practices Guide was developed through this project to serve as a single source of information that could be used by natural gas distribution system operators to investigate and remediate existing cross bores as well as prevent future cross bores.

Deliverables

A detailed report was developed that provides a set of best practices for preventing and detecting cross bores.



A cross bore is defined as an intersection of an existing underground utility or underground structure by a second utility installed using trenchless technology resulting in direct contact between the transactions of the utilities compromising the integrity of either utility or underground structure.

The report includes an investigation of available technologies and various industry issues.

The report includes information on:

- Practices for clearing potential cross bores
- Practices and technologies for preventing cross bores, and
- Practices and technologies for detecting legacy cross bores.

Benefits

The results of this research can be used by gas-system operators to reduce their risk and exposure to the threat of cross bores. The Best Practices Guide provides methodologies, technology recommendations, and procedures for preventing and detecting cross bores.

Technical Concept & Approach

The development of this Cross Bore Best Practices Guide included the review of information from a wide variety of sources across North American, including numerous natural gas distribution companies, installation contractors, remediation contractors, equipment providers, industry associations, and industry literature. The combined customer base of the 23 gas companies interviewed represent 80% of the 75 million natural gas customers in the United States and Canada.

Information regarding state or city-specific rules and regulations were also collected.

Researchers and an advisory group developed a methodology for creating the best practices.

Results

The core of the Best Practices Guide stems from recommendations of the National Transportation Safety Board (NTSB) following a 1976 incident, that advise:

- Complete inspection of those locations along the construction route where gas mains and sewer lat-

erals may be in proximity to one another and correct any deficiencies.

- Examining records to determine other locations where gas lines were installed near existing sewer facilities (including a review of sewer blockage complaints), then inspect these locations and take corrective action where necessary
- Revising construction standards to require that the underground facilities be located accurately before construction and to provide protection for these facilities near boring operations
- Informing inspectors and supervisory personnel of the circumstances of this accident, train them to be alert for similar conditions, and advise them of preventive actions.

Researchers found that the majority of the differences in the approach used to assess the potential for a cross bore were obvious (e.g., as the likelihood of a full basement or the need to construct a sewer at a depth below the level of frost penetration in the north). Soil conditions, the influence of existing or proposed legislation, the use of the “one-call” systems, the use of bi-lingual outreach materials, and other factors varied between companies and are identified in the Guide.

The first section of the Guide provides best practices and general guidelines for local distribution companies on the cross bore topic. A quick guide is provided that captures the primary items that should be used to focus the development of each company’s best practices:

Quick Guide

- Comply with all regulations
- Dedicate resources
- Do not assume a lack of a natural gas service precludes a location from having a cross bore
- Use a record-keeping system that is fully auditable
- Use a GIS to collect and organize data
- Use a risk-based approach
- Include cross bores within a Distribution Integrity Management Program plan
- Develop operating procedures and training programs specific to cross bores
- Coordinate information exchange with one-call systems.

The second section of the Guide provides best practices for addressing cross bore events that currently exist due to previous installations, referred to in the Guide as *legacy installations* or *legacy cross bores*.

Of the companies interviewed, 39% have a legacy program in place, 17% are developing a legacy program, 13% do not have a legacy program but are exploring the option, and 30% do not have a legacy program. Several companies indicated that a “found” cross bore was the best indicator that there may be others in the immediate area.

The most cost-effective approach to the investigative efforts for legacy cross bores uses a risk-based approach that progresses from an office review of records to a focused field investigation and remediation.

The development and deployment of a communications and educational outreach program was among the first steps taken when addressing legacy installation. Sewer tags are commonly used to alert plumbers or do-it-yourselfers of the potential issue, along with websites, bill inserts, advertising, etc., to raise awareness within the general public.

The third section of the Guide focuses on preventing cross bores during new installations. The most common method used to reduce risk of a cross bore during new installations was to expose the sewer at the potential point of intersection and observe the bore as it passes each intersection as well as when the reamer is pulled back. The next most common approach was the use of a camera inspection prior to and following the installation which may be done in combination with exposing the sewer at the potential point of intersection.

The Guide also provides contact information for organizations with additional information and a series of appendices that provide the full text of the NTSB summary of the first incident investigation in 1976, examples of a wide variety of communications and education materials, a summary of cross bore related legislation and regulations, and a summary of technologies under evaluation for further development to detect if a transaction of a sewer line has taken place as part of a new installation.

Status

This project is complete. The Cross Bore Best Practices Guide was made available in January 2012.

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