Overview of PG&E Cross Bore Inspection Program

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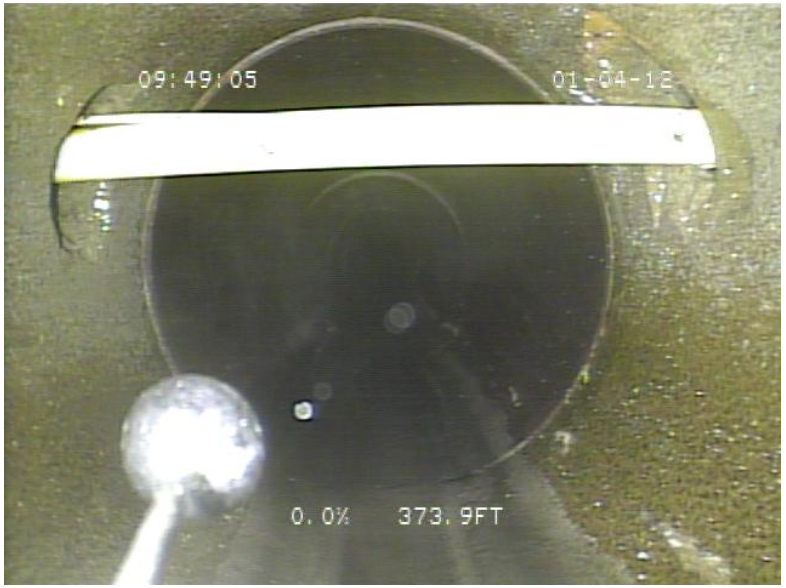
Cross Bore

- Unintended conflict between two underground utility systems
- Associated with trenchless construction methods
- PG&E inspections focusing on natural gas system conflicts with wastewater collection systems including private service laterals
- FES retained by PG&E to conduct the inspection program



1” Gas Cross bore

Why is PG&E Conducting This Program?

- Desire to operate a safe system
- Minimize risks to customers, wastewater operators and drain cleaners
- Occurrences in PG&E's system
- Increased awareness of this issue nationally
- Acknowledgement of potential risks due to construction methods (trenchless)
- Regulatory compliance (DIMP)

Gas Cross Bore

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Trenchless Construction Methods

- Pneumatic Percussive Boring/Piercing (gophers)

  Mainly used for service installations

- Horizontal Directional Drilling

  Main and Service installation method – reduced construction cost, minimal surface impact/restoration, increased production

Piercing Equipment
Photo courtesy of Ditch Witch

Horizontal Directional Drilling Equipment
Photo courtesy of Ditch Witch

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FES Program Strategy

- Research available records for construction method(s)
- Focus on construction methods and system wide replacement programs

  Trenchless construction

  Copper Service Line Replacement Program (CSRP)

- Accelerate identified priority location inspections (schools, hospitals, churches, high population density areas)

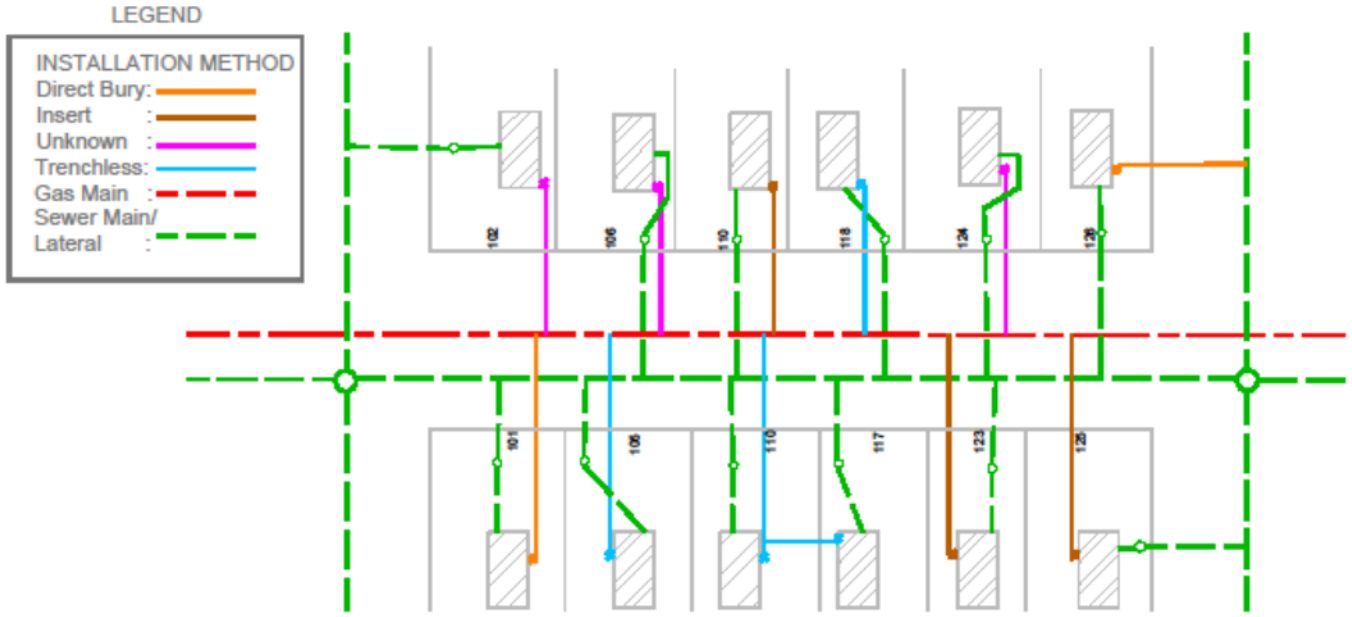
CSRP

- Program started in 2009 focusing on replacement of copper service lines
- Approximately 34,000 service lines have been replaced to date
- High level of CSRP activity in San Francisco (16% of system total)
- Replacements have occurred throughout service territory
- Replacements range from individual isolated lines to all services on a given block

Tom Blum shows the flakey evidence of corrosion in the copper pipe.
Photo courtesy of IBEW website

New Construction

- New construction or gas main replacements
- Some service lines replaced others transferred
- Scanning gas records, currently in San Francisco, will move to other Divisions in future (developing & documenting process)
- San Francisco focus due to high customer density
- Researching main/service installation methods to focus inspections on trenchless construction



Goals of Cross Bore Inspection Program

- Minimize risk to customers
- Create documented system/method for cross bore investigations
- Discover and fix cross bores
- Create traceable records for future reference
- Complete inspections of all potential cross bore locations

Excavated cross bore

FES Inspection Methodology

- Conduct lateral launching inspections (from main) to the structure
- Utilize push cameras when unsuccessful with lateral launching equipment
- Collect GPS data points (manholes, main tap locations, clean outs, entry to structure or point beyond gas meter)
- Conduct LACP coding of inspected laterals

Lateral launching camera

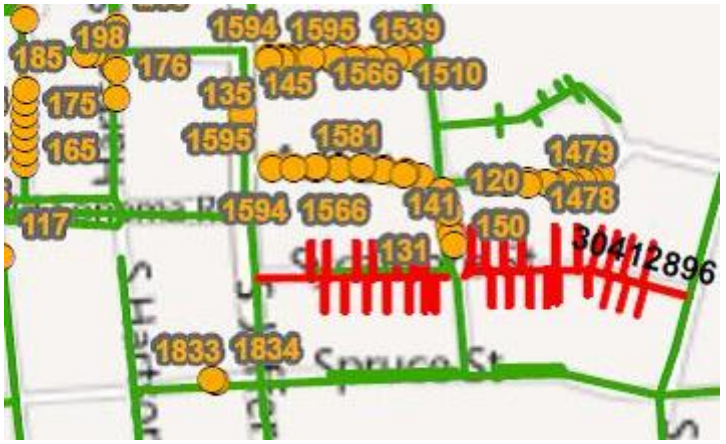
Anticipated Problems

- Main diameters 6”≥ difficult to lateral launch
- Flushing and cleaning required for acceptable inspection (FOG, tree roots, debris)
- Limited access to laterals (6”≥ mains, no clean out, yard traps, backflow devices)
- Structure access required (customer coordination, removal of toilets, roof vents access, etc.)
- Installation of clean out required
- Existing wastewater system structural defects
- Standing water limiting inspection video quality

Push camera operation

Steps Prior to Inspection Scheduling

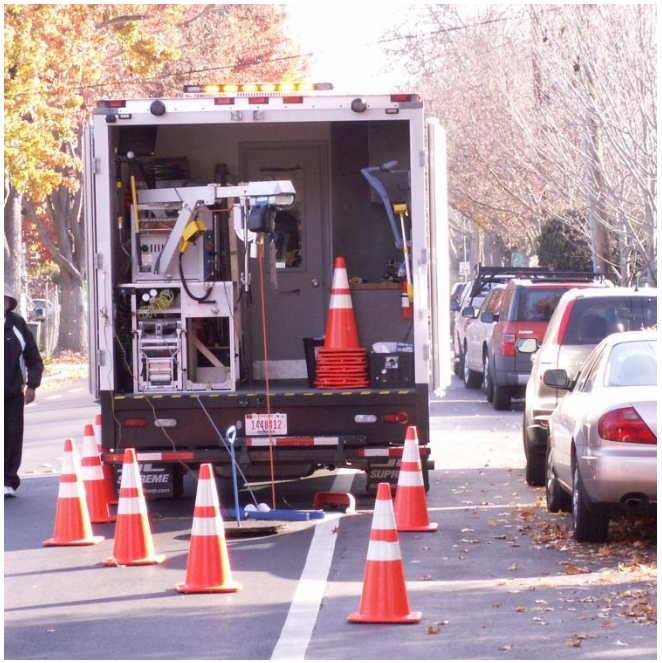
- Research PG&E records for trenchless construction locations
- Identify areas to inspect
- Create shape files for gas facilities (geo-referenced)
- Obtain associated wastewater system maps
- Overlay wastewater facilities onto shape files
- Gather required permits
- Assign contractors to identified areas



Shape file indicating construction, CSRP and Wastewater Information

Performing Work - Slide 1

- Insert lateral launching camera into sewer main and access /locate all tap locations (GPS) between manholes for each reach investigated
- Clean mains as required to gain acceptable video (flush, dewater, root clearing, etc.)
- Launch camera into each lateral capturing GPS coordinates (tap, clean out, entry to structure)



Typical camera truck

Performing Work - Slide 2

- Utilize push cameras when lateral launching unsuccessful (clean laterals as required)
- Investigate all branch laterals
- If video attempt unsuccessful, GPS locate extent of attempt and create proximity waiver based on gas service location if possible
- If unable to issue proximity waiver due to uncertainty of underground locations install clean out to complete inspection

Manhole camera launch

When Cross Bores Are Found

- If cross bore is not gas, notify owner of sewer
- If cross bore is gas, stand by until repair crews arrive
- Contact responsible wastewater operator
- FES to document surface condition prior to excavation
- Conduct repairs to sewer (Wastewater Operator standards, UPC) and relocate gas line
- Document occurrence of cross bore
- Re-inspect sewer facility post repair (provide sewer owner with video upon request)
- Repair all associated surface improvements (street, sidewalk, landscaping, etc.)

Relocated gas line

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Post Video Collection

- Contractor will provide three levels of quality control.
  - Camera Operator observation
  - Front office review
  - Back office LACP (lateral assessment certification program)coding
- FES will conduct further statistical sampling of videos based on a frequency to be determined
- Videos will be linked to shape files for future reference/traceability

Tree root intrusion

Required Cooperation for Success

- Access to wastewater facilities adjacent to PG&E trenchless construction
- Wastewater maps (hopefully electronic)
- Ability to dispose of debris flushed/cleaned from system to allow video inspection
- Wastewater system construction standards
- Inspection support when repairs are required on your system
- Agency notification when defects found
- Prompt notification if contractors are not performing work correctly

Avoided Sanitary Sewer Overflow (SSO)

Structural failure

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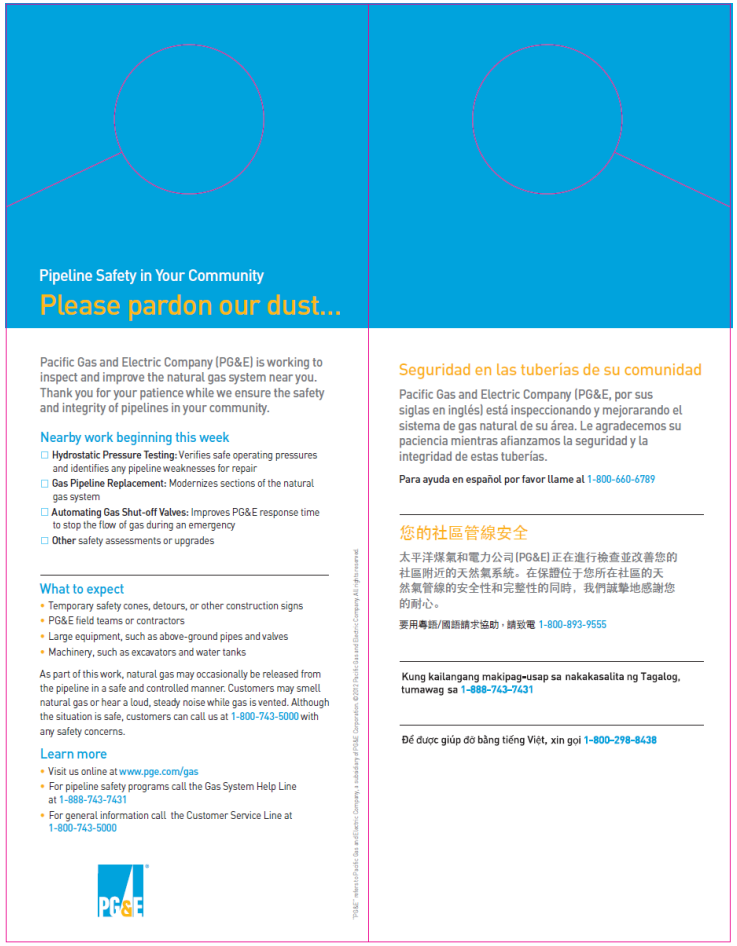
Notification

- PG&E customer communications will be included in this effort
- Door hangers will be placed on all CSRP customer locations relaying the message to “Call PG&E before you clear”
- Calls to PG&E related to the CSRP hangers will be routed to FES for follow up
- Notify cities/agencies prior to initiation of inspections within their jurisdiction
- Video inspection contractors will place door hangers at all locations to be inspected at least one week prior to video capture activity
- Door hangers will be placed after inspections to report the results



Pipeline Safety in Your Community

Please pardon our dust...

Pacific Gas and Electric Company (PG&E) is working to inspect and improve the natural gas system near you. Thank you for your patience while we ensure the safety and integrity of pipelines in your community.

Nearby work beginning this week

- **Hydrostatic Pressure Testing:** Verifies safe operating pressures and identifies any pipeline weaknesses for repair
- **Gas Pipeline Replacement:** Modernizes sections of the natural gas system
- **Automating Gas Shut-off Valves:** Improves PG&E response time to stop the flow of gas during an emergency
- **Other** safety assessments or upgrades

What to expect

- Temporary safety cones, detours, or other construction signs
- PG&E field teams or contractors
- Large equipment, such as above-ground pipes and valves
- Machinery, such as excavators and water tanks

As part of this work, natural gas may occasionally be released from the pipeline in a safe and controlled manner. Customers may smell natural gas or hear a loud, steady noise while gas is vented. Although the situation is safe, customers can call us at 1-800-743-5000 with any safety concerns.

Learn more

- Visit us online at www.pge.com/gas
- For pipeline safety programs call the Gas System Help Line at 1-888-743-7431
- For general information call the Customer Service Line at 1-800-743-5000

Seguridad en las tuberías de su comunidad

Pacific Gas and Electric Company (PG&E, por sus siglas en inglés) está inspeccionando y mejorando el sistema de gas natural de su área. Le agradecemos su paciencia mientras afianzamos la seguridad y la integridad de estas tuberías.

Para ayuda en español por favor llame al 1-800-660-6789

您的社區管線安全

太平洋煤氣和電力公司(PG&E)正在進行檢查並改善您的社區附近的天然氣系統。在保證位于您所在社區的天然氣管線的安全性和完整性的同時，我們誠摯地感謝您的耐心。

要用粵語/國語請求協助，請致電 1-800-893-9555

Kung kailangang makipag-usap sa nakakasalita ng Tagalog, tumawag sa 1-888-743-7431

Để được giúp đỡ bằng tiếng Việt, xin gọi 1-800-298-8438

Draft PG&E Door Hanger

Future Cross Bore Program

- Develop schedules for all anticipated work
- Expand program to all PG&E Divisions that utilized trenchless construction
- Determine overall program costs based on current effort
- Evaluate expansion of the program to new construction
- Continually improve the program based on varying field conditions

New main installation

Thank You For Your Attendance

Please contact me directly if you have any questions, concerns or require clarification.

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