



Keyhole Technology

Uses – Construction and
Maintenance – Internal and
Contractor Crews

November 13, 2012

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Why the move to keyhole technology construction?

- **Primary**

- Spend dollars remediating couplings/replacing pipe vs. paving (M&O) roadway.
- Move to mass service replacement with rehabilitation project and then accelerated pipe replacement programs.
- Improved customer experience because permanent restoration performed at time of service replacement.

- **Secondary**

- Increased project productivity.
- Eliminated 2nd trip for restoration efforts.



How did WG move from the use of keyhole primarily by internal forces to contractor forces?

- **Leveraged existing Alliance relationship.**
 - Experienced with technology.
 - Ability to invest in equipment and talent.
- **Competitively bid blankets with others.**



Keyhole Technology Timeline at Washington Gas

2003:

- WG O&M crews .
- CP and spotting/day lighting.
- Tracked at hourly rate.

2006 - 2008:

- WG Contractor Crews.
- Main encapsulation work.
- T&M rates; establishing unit rates.

2010:

- WG Contractor Crews.
- Main encapsulation work and service replacements.
- Moved to unit rates; updated WMIS.



Companion Technologies

Camera launch capability for coupling encapsulation.

- Pre 2008 typically required cutting out a 5' section of main using a combination of stoppers and gate valves to launch camera.
- Post 2008 creation/use of a camera launch fitting to allow direct live camera insertions.





Companion Technologies Cont.

Shortened EFVs.

- November 2010 development and use of a Perfection Tee.





Evolution/change in Design Considerations

- Initial planned replacement design of coupled main for encapsulation of the couplings – planned camera launches.
- Eventual planned replacement design of coupled main for encapsulation of the couplings and service replacements – planned camera launches & keyhole service replacements.
- Now mass service replacement in accelerated pipe replacement programs
 - Construction prejobs projects to access existing roadway condition.
 - Core Farm constructed.
- Permitting jurisdictions require identification of construction methodology.



Challenges in Permitting of Work

- Turnover in personnel.
- No specifications in jurisdictions' standards.
- Need to pave roadways.



Keyhole Permitting NOT New

The keyhole method had previously been approved by numerous jurisdictions in our operating area:

Jurisdiction	State	Approved
Rockville	MD	7/8/2003
Chevy Chase	MD	8/12/2003
VDOT	VA	12/29/2003
Prince George's Co	MD	3/16/2004
Charles Co	MD	4/27/2004
Arlington Co	VA	5/25/2004
City of Fairfax	VA	7/29/2004
City of Vienna	VA	9/22/2004
Maryland State Hwy	MD	11/10/2004
Montgomery Co	MD	8/11/2009
District of Columbia	DC	8/21/2009