the Energy to Lead

gti

KEYHOLE COLLABORATION PROGRAM - Continuation

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PROGRAM

The Gas Technology Institute (GTI) is the industry's center for keyhole technology innovation; developing, testing, and facilitating innovative "keyhole" technologies for utility system installations, repairs, and renovations. With keyhole techniques, maintenance activities are conducted through small pavement openings, resulting in significant cost savings, reduced public inconvenience, and more efficient repairs.

Program Vision

The program goals are to continue to provide value and share ideas with the stakeholders and to contribute to the acceptance and advancement of keyhole technology through:

- Focus on customer needs
- Promote the use of the technology
- Provide technical solutions
- Marketing and Implementation
- Provide a central resource of information

Recent program accomplishments include the continued implementation of keyhole methods by utilities in North America and overseas, jurisdictional acceptances of the keyhole coring process, a CGA Best Practice of vacuum excavation, resource sharing through a keyhole SharePoint site, the development of an interactive database of guidelines of keyhole methods, and the creation of keyhole videos to assist with training and implementation.

BUSINESS VALUE

The Keyhole Technology Program provides an arena for information sharing between utilities themselves and manufacturers, and also gives the utilities a unified voice in the marketplace. Manufacturers can receive feedback and understand the needs of the utilities with respect to keyhole technology through this unified voice. Utilities can efficiently share information among themselves through the Keyhole Technology Program.

This information sharing, along with testing and development work, creates the driving force that propels keyhole technology forward and expands its capabilities and effectiveness.

Specific value provided through participation in the Keyhole Technology Program includes:

- Development and access to a centralized information resource center containing technical reports, guidelines, and best practices to assist in the implementation and acceptance (internal and external) of the keyhole process.
- A community of industry experts which promotes open communication and sharing of information and experiences.
- Provide technical expertise and resources needed to support the implementation and acceptance of this innovative technology.
- A concerted group effort to gain jurisdictional acceptance of the keyhole coring process.

INDUSTRY NEED

Keyhole technology is being embraced by utilities and manufacturers and there is a move toward performing more varied maintenance and operations activities through a keyhole. As companies expand the use of keyhole, there is an increased need for new tools, process

development, and training on the processes. There is also a need for communication among utilities in the form of learning from one another and working and coordinating efforts with manufacturers. Finally, the collaboration of utilities creates a unified voice, further advancing keyhole tooling and equipment from various manufacturers. This has been evident with a greater number of contractors working in our industry offering and performing keyhole type activities including coring. Also, additional jurisdictions have accepted the coring and core replacement process, however, the jurisdictional acceptance remains a high priority need for keyhole technologies to advance.

BACKGROUND

Keyhole technology provides a cost-saving alternative to common repair methods, which often require large "open" excavations, followed by the removal and disposal of unwanted pavement and soils. These conventional practices – usually performed using several large pieces of equipment (backhoes, dump trucks, pavement breakers, etc.) – can account for 80% of the total cost of a repair job.

SCOPE

The program has successfully provided and helped many utilities in establishing keyhole technology and procedures in their routine operations and maintenance programs. Several tools, case studies, evaluation reports, and other documents have been developed through these efforts.

The program layout addresses the emerging needs for establishing core acceptance by the various jurisdictions, new applications for the technology, and the need for implementation and training, and establishing procedures for existing applications.

The proposed future work targets areas of need that have been identified from current research and through surveying the industry and participating utilities. These focus areas include, but not limited to:

1. Establish keyhole best practices and guidelines
2. Support jurisdiction acceptance to coring reinstatement
3. Provide training and education to the technical and field crews and trainers.
4. Continue the development of tools and equipment to support new applications.
5. Overall promotion of the technology to the utility industry and to the various industry associations and jurisdictional agencies.

Focus Area 1 – Establish Keyhole Best-Practices and Guidelines

Need: Utilities nationwide have been implementing various keyhole processes in their day-to-day operations. A collection of keyhole processes is needed to help utilities reference specific processes that they might want to implement for use by their construction crew and contractors.

Approach: Develop a keyhole guidelines to provide step-by-step details (e.g., instructions, tools needed, tool manufacture information, etc.) on how to perform the specific process through keyhole.

The keyhole guidelines will be in an interactive format to provide utilities with a comprehensive manual to reference various keyhole operations. This guide will provide easy step-by-step instructions, along with visual aids (photos and videos), and list the equipment needed to carry out these tasks.

This guide will allow utilities to maintain crew proficiency on commonly used keyhole processes as well as the resources needed to implement new processes into their keyhole program.

Focus Area 2 – Support Jurisdiction Acceptance to Coring Reinstatement

Need: Core reinstatement acceptance has a high priority for the Keyhole Program participants. There is a need for case studies and reports on the acceptability of reinstating the keyhole core. This effort should be focused on preparing technical packages that members of the group can use and share with local municipalities to assist in the broader acceptance and use of coring and core reinstatement practices.

Approach: A number of engineering data and test results exist from research projects performed by several grout manufacturers and research organizations. In addition, various case studies can be developed to show how others have successfully implemented the keyhole process and how jurisdiction are accepting and embracing the coring process.

The previous work and successful implementations will be identified and evaluated. These documents will be compiled to produce:

1. Technical reports and case studies on core acceptance criteria (includes available engineering data).
2. Articles and documents reviewing the core reinstatement acceptance that the members can use for various municipalities.

Other items to be considered in this effort include:

- Existing coring experience (acceptance and use)
- Coring/restoration standards
- Draft standard to assist with more efficient adaption by jurisdictions

Focus Area 3 – Training and Education

Need: Effective training is a key driver impacting successful implementation of emerging technologies. Keyhole technology offers an immense cost savings potential for utility operations and the gas industry has recognized the need for effective training on keyhole applications and processes to broaden knowledge and exposure as well as to ensure consistent standards are met, and savings potentials are realized.

Training and education needs for keyhole technology span broader initiatives such as awareness building and best practice dissemination to specific field training on critical field practices and procedures. Standardized regional and company specific workshops for typical keyhole equipment and procedures have been identified as a specific need.

Approach: The development of keyhole technology education and training materials will be defined and driven by utility stakeholders in coordination with GTI technology and training staff. A utility advisory team will be formed to provide input and prioritization of specific needs and training approaches. Initial input has been to identify specific training gaps and recommend potential modes and approaches. Training options to consider include development of improved classroom course material, as well as "hands-on" training for typical keyhole applications at regional locations and independent utility sites. Additional aspects under consideration include "train-the-trainer" approaches and integration of classroom and hands on approaches with self-guided multimedia training.

Task deliverables will include:

(1) Keyhole technology training framework
(2) Updated training materials for new and existing courses and workshops.

Upon consideration and recommendation by the advisory committee, the updated materials may include classroom materials, procedures and materials for regional "hands-on" workshops, and multi-media simulation tools.

Focus Area 4 – Development of Tools and New Applications

Need: The development of keyhole tools is a key task (umbrella task) in the implementation of the technology in gas operations. The current tools in the market cover some of the operations that can benefit from keyholes such as tracer wire connector tool, PE scrapper, and universal cap tool for the removal and installation of service tee caps.

There is a need to provide tooling to a wider range of applications including service line installation and renewal.

Approach: The continued support of new keyhole applications by developing tooling and equipment to meet the needs of the industry. This effort will be driven by stakeholders needs and coordinated by the strategy team.

Focus Area 5 – Active Promotion of Keyhole Technology

Need: Keyhole technology is being embraced by utilities, their contractors, and manufacturers and there is a move toward performing more varied maintenance and operations activities through a keyhole. However, keyhole technology is still considered to be a "unique" or "special" way of performing utility excavations and construction and maintenance activities. In order for keyhole to be considered a more standard practice, greater acceptance must be obtained. This acceptance must take place not only by the natural gas utility industry but it must also be accepted and embraced by the contractors performing the work, other utilities with underground infrastructure (and their workforce), and the cities and other jurisdictions overseeing the public right-of-way.

If limitations (internal and external) are placed on the use of keyhole technology practices, this will have a dramatic impact on the expansion and acceptance of its use and implementation.

Approach: GTI will continue to actively promote keyhole methods with all utilities, owners of the right-of-way, and the various agencies and associations to gain better awareness to the benefits and ultimately leading to a greater acceptance and use.

The keyhole benefits to promote will include:

- Reduction in excavation and restoration costs,
- Damage preventative technology through the use of vacuum excavation,
- Improved community and customer relations,
- A greener technology – due to recycling of pavement and spoil,
- Improved worker safety, and
- Minimizes damage to the roadway.

PROGRAM MEMBERSHIP

Utility Two Year Membership – $20,000 ($10,000 per year)
This provides essential baseline support for the coordination, development and growth of the program and provides utility members with access to all available communications, materials, and databases.

Manufacturer Two Year Membership – $5,000 ($2,500 per year)
This provides essential baseline support for the coordination, development and growth of the program and provides this group of members with access to all available communications, materials and databases.

PROJECT TEAM

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and

All of the Utility and Manufacturer Keyhole Program members that participate and assist in developing processes, tooling, ideas, and promoting the keyhole way.