



Keyhole Technology for the Gas Utility Contractor

Background:

Keyhole technology is quickly becoming a preferred method for the performance of day to day maintenance and system improvements on gas distribution systems. The principle reason for this paradigm shift at the LDC's is a direct result of the implementation of core cutting and restoration methods as well as the cost reductions that the utility companies have realized from the use of the latest keyhole procedures.

The introduction of core cutting the excavation openings for keyhole procedures has effectively eliminated the distribution utilities' pavement restoration costs while improving their relationships with their customers and local municipalities. Experience has shown that utility companies that have fully implemented coring operations have realized operating savings that often will exceed a million dollars in their paving budgets. In the recent past some utilities have been reluctant to adopt this technology. Some felt that the time investment that would be necessary to get buy-in from all of the owners of their local streets and highways plus the up-front costs of the coring equipment would be prohibitive. To the contrary they found that when they invested their management resources into a detailed risk/reward analysis the resulting cost of implementation was negligible when compared to the saving they would realize for many years to come.

In addition to the advantages resulting from the use of coring operations at the LDC's the utilities also found that there had been a dramatic improvement in the tooling and quantity of procedures that had been developed for keyhole operations. In the early years the tools available to perform keyhole procedures addressed simple operations such as leak repairs and service retirements on low pressure cast iron systems. With the help of the Gas Technology Institute (GTI) and a number of gas utility equipment manufacturers there has been a dramatic expansion in the number of operating procedures and tools that have been developed to perform maintenance and system improvement operations. Tooling and methods to retire and renew services on medium and high pressure systems have proven to have the ability to perform these processes safely and at a dramatically reduced cost. New services can be installed with little or no need for excavation on the customers' property while corrosion control test stations and anodes can now be installed thru openings as small as 12" diameter.

Vacuum Excavation Systems and Tooling for Keyhole Technology

There is little doubt that the LDC's would like to see "keyhole technology" implemented into their daily operations. Many of them have purchased their own coring rigs and vacuum trucks to support numerous crews performing these operations. Contracting bids are now being written that demand or offer preferential treatment to bidders that employ keyhole methods. Gas utility contractors that have invested in these methods have found that they have developed a competitive advantage over other contractors because they are now perceived by the utility companies as an innovative company that has an interest in partnering with their customers to capture the benefits that keyhole technology has to offer.

Business opportunity:

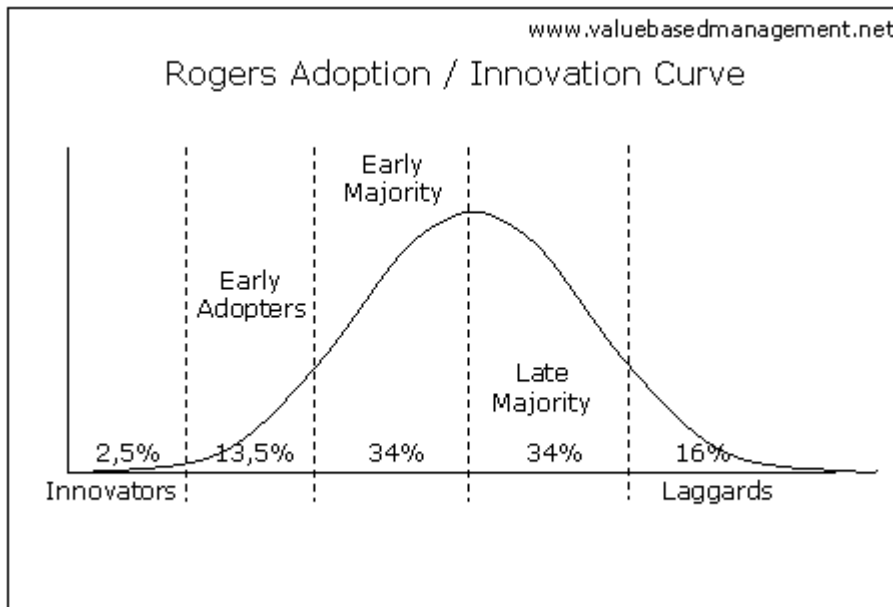
Historically it has been the nature of the utility industry to be slow to adopt new technology into their business model. In the past, when utility companies were perceived as "regulated monopolies", the management decision process was heavily influenced by federal and state regulatory agencies. This resulted in a decreased incentive to improve their operating methods. In recent years there has been a mandate to move toward deregulation of the utility industries in an effort to introduce competition into the marketplace. This has resulted in a desire to become more innovative in everything they do. Today's utility management must demonstrate that they are moving their business forward, providing value to their shareholders and customers. The value of utility company can be substantially diminished if it is perceived to support a culture that has little interest in proven ways of improving the operation of their business.

As LDC's develop an understanding and familiarity with keyhole technology the gas utility contractor is presented with sizeable long-term business opportunity. The existing utilities that have experience with keyhole technology have either developed their own in-house keyhole programs or they have worked with one of the few contractors that have experience with this technology. These organizations are known as "innovators" or "early adopters". As more gas companies become aware of the successes experienced by the innovators and early adopters they have been inclined to perform their own risk/reward appraisal. They have found that this technology has not only achieved a level of maturity in which the barriers to implementation have been resolved but the rewards of application are extensive. These utilities are looking at ways to implement this technology into their operations and the contractor who can present his company as the purveyor of keyhole technology holds a very strong position with these gas utilities considering that their only alternative is to develop an in-house program.

If the contractor would like to assess the extent of the long term business opportunities available it becomes necessary to determine how many LDC's are not presently using keyhole technology. In addition to this there must be an assessment of how many additional crews could be added at the utilities that presently have keyhole programs in place. A simplistic way to make this determination may be performed by reviewing the Rogers adoption/innovation curve. If we assume that the "innovators" and "early adopters" make-up most of today's users

Vacuum Excavation Systems and Tooling for Keyhole Technology

of keyhole technology it is easy to see that more than 80% of the business opportunities (early majority, late majority & laggards) still remain to produce additional future keyhole contracts.



Contractor application of keyhole technology:

All keyhole procedures require (1) formulating an accurate location of the gas lines to be addressed, (2) core cutting the location designated to be the excavation site, and (3) excavating to expose the main and related structures. After excavating to expose the designated fittings (4) the repair or maintenance procedure is performed followed by (5) backfilling of the excavation and (6) restoration of the pavement by grouting the core back into the cored opening.

The least complicated approach for addressing standard keyhole jobs is to utilize a specialized vacuum excavation truck specifically equipped to support keyhole procedures. These trucks have the ability to tow a trailer mounted coring rig to the work site. This allows a two man crew the ability to safely and effectively complete any standard keyhole procedure from start to finish. Experience has shown that a well-trained and properly equipped two man crew can complete three to four jobs per day based upon the extent of work for each job and the amount of travel time between jobs.

A second approach that is commonly used to achieve better productivity or support projects that are positioned in more than one location is the deployment of two keyhole type vacuum trucks supported by one coring rig that is mounted on a pick-up or utility truck. The operator of the coring rig performs the locating step and then cuts the cores for both vacuum trucks. The core truck operator must be skilled at planning the work as well as the performance of accurate locations. When using this type of approach the contractor has the flexibility to support jobs at multiple locations provided that they are in relatively close proximity to each other.

Vacuum Excavation Systems and Tooling for Keyhole Technology

The third and most capital intensive approach is to have every task performed by a different individual or crew. First the core truck operator locates and performs the core cuts. This is followed by a vacuum truck crew that excavates to the main. After excavation is completed a gas mechanic performs the maintenance or repair procedure followed by a fourth operator or crew that back-fills the excavation and restores the street surface by grouting the core in place. This can be a very successful approach for achieving good productivity provided that there are no equipment break-downs or problems that prevent a step from being successfully completed. This type of operation usually demands that all of the jobs are lined up on the same street and that the total contract is large enough to support the use of a “hydro-vac” truck, which will cost about \$350,000, as well as all of the additional vehicles that are required to support this operating method.

Understanding the Deliverables:

Keyhole methods and procedures have matured to a point where most of the gas utility companies fully understand that they can expect extremely high levels of excellence for the work performed using these methods. Standard keyhole procedures are supported by highly detailed step by step instructions and flow charts to insure that the operator does not weaken the integrity of the procedure with discretionary activities that may result in leaks or misassembled connections. When cores are reinstated properly they never fail. This is critical to receive acceptance from state and local public works entities.

In the past, when keyhole technology was in the development stages, utility system owners would allow crews to perform jobs by making conventional (3 ft. x 5 ft.) pavement cuts in place of cored openings. Problems in the procedures were attributed to poor locates or ineffective tooling to complete the job properly. Today the utility companies are developing a comprehensive knowledge of tooling and equipment that is presently available for keyhole procedures and they are questioning the competence of contractors or in-house crews that do not utilize the specialized equipment specifically designed to perform these jobs correctly.

Conclusion:

Just like the utility companies that can be categorized as early adopters, early majority, late majority, etc. the contracting companies will eventually position themselves in one of these categories when compared to the rest of contracting industry. The companies that are the early adopters and early majority will usually be perceived as the industry leaders and as such will be afforded more new business opportunities than the contracting firms that adopt keyhole technology after the leaders have developed their positions in the marketplace. Keyhole technology is no longer the technology of the future. Utility contractors that want to continue to grow with their utility customers may be well advised to take a look at how the use or lack of interest in this technology will affect their relationship with their customers in the future.