

NationalGrid US Keyhole Program Overview



November 13, 2012

National Grid keyhole history

■ Legacy Companies started independently

- ✓ 1994 - BUG started the effort in 18"x18" openings
- ✓ 2005 - Started first replaceable cores
- ✓ 2006 - NGrid UK initiation
- ✓ 2006 – New England – Boston Gas Initiation
- ✓ 2008 – Began a comprehensive data gathering program
- ✓ 2010 – Long Island – Lilco Initiation
- ✓ 2012 – Continue to measure against predetermined goals

Keyhole program is currently monitored by the **nationalgrid** Deployment of New Technology Team (DNT) Organization

DNT Organization Overview:

- The organization works closely with R&D, Resource Planning, Gas Distribution Project Management, Information Technology and Operations to identify and establish opportunities to utilize new technology utilization in planned projects during the design phase.
- The DNT team works with field teams/crews/individuals while determining the “fitness for use” of the new technologies under review.
- The testing deployments usually span from 1 to 3 years and during this timeframe the DNT team will gather, track and report on all relevant data, including cost benefits.
- The measuring mechanism will be thought out to facilitate “easy” data gathering and will also enable an seamless handoff to Operations when the technology has proven feasible and the timeframe for testing has been completed.

Current keyhole statistics

- **Number of All National Grid U.S. Crews = 10**
 - New York City = 3
 - New England = 5
 - Upstate New York = 2
- **Calendar year 2012 US keyhole coring goal is 3,967 cores**
- **As of September 2012 US keyhole crews completed 2,518 cores**

Number of jobs performed by type

- Based on *historical data* the has been gather for over 3 years the average percent distribution related to job type are as follows:
 - Test Holes ~ 24%
 - Cathodic Protection ~ 23%
 - Abandon Service ~ 18%
 - Valve Maintenance ~ 14%
 - Cast Iron Joints ~ 10%
 - Other ~ 11%

Has the data proven keyhole technology feasible?

- The data collecting and reporting over the last 3 years has proven that there are significant financial savings tied to paving and man-hours
 - ~ \$ 465/job (paving, spoils removal and improved productivity)
- This is now an integrated technology and will continued to be used going forward.

How we measured...

- From 2008 until 2012 we utilized the following data collection form:

NATIONAL GRID KEYHOLE RECORD CARD									
Region	Downstate - LI	Yard Location			Road Location	State	County		
	Downstate - NYC	Site Address			Protected Road	Yes	No		
	Upstate - Capital Region								
	Upstate - Eastern Region								
	New England								
Paving Territory					Road Type	Asphalt	Asphalt/Concrete		
Field Supervisor					No. Of Men				
Date					Diameter of Gas Facility (inches)				
Gas Facility	Main	Service			Quantity of bonding compound Used				
Crew Leader				Start Time					
Job Number				Number Of Core (s)					
Core Diameter	18"	24"			Core Thickness (Inches)				
Type Of Job on Site	Abandon Services	Cathodic Protection	Valve maintenance	CI Joint Repair	Pressure	High Pressure	Intermediate Pressure		
	Test Hole	Other			Finish Time				
					Vacuum Only	Yes	No		
					Facility Depth (Inches)				
					Description Of Sub Base Removed	Clay	Gravel		
						Soil	Hardcore		

Enabled us to get good information about our use of this technology

At the beginning of 2012 it was determined that this technology was viable and is now an accepted technique within National Grid operations.

How we measure... now

- As of January 2012 we shifted to implementing just a “Control Measure,” which is just the number of cores each yard completes each month
- Done to assure that all our yards are working to meet their yearly keyhole coring goals
- Measure CYTD against yearly goals
- A monthly report containing the information on the right of this slide goes to all Operating Executives, Directors & Managers from all Regions

Yard	Sept	CYTD Total	CYGoal
Braintree	1	54	308
Waltham	26	171	308
West Roxbury	0	50	308
Malden	51	460	308
New Hampshire	NA	59	308
Rhode Island	35	124	616
Canarsie	56	565	528
Greenpoint	35	439	704
Staten Island	27	169	287
Albany	23	161	300
Syracuse	17	266	300

Questions?

Thank you for allowing National Grid to share our experiences!