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Practical Aspects of Managing Gas Distribution System Methane Emissions

PHMSA R&D Forum August 2014
Robert D. Wilson, Director, Pipeline Safety Strategy

Agenda

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- EDF, PHMSA & National Grid *Parallel Goals*
- *A "Good Science & Common Sense" Perspective*
- Our System & Emission Improvements – MA Focus
- Management Strategies & Challenges
- Advancing Research & Technology

Massachusetts Asset Inventory

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- **876,157 natural gas customers** in 116 communities
- **11,021 miles** of gas distribution gas main
- **13 miles** of gas transmission main
- **759 locations** where gas main exists on bridges
- **548 natural gas regulating stations**
- **41 natural gas gate stations**
- **8 LNG facilities**
- **720,001 natural gas services**

National Grid is the largest CI asset holder in the country with over 16% of the nations Inventory

As of 31st December 2013

Mandated Programs

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- **Proactive Gas Main Replacement** - 125 miles
- **Reactive Gas Main Replacement** – 1.4 miles (230 CI Joints)
- **Gas Service Replacement Program** - 2,586 HP gas services
- **Large Diameter CI Lining / Rehabilitation / Replacement Programs** - 9 miles (4,000 CI Joints)
- **City / State Construction (Public Works)** – 40+ miles

Common Goals……..

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- National Grid supports fundamental principles highlighted by EDF and more specifically for MA, CLF Reports ….. *reducing methane emissions from natural gas pipeline infrastructure*
- However, we need to work more closely to ensure all stakeholder concerns *are in balance* as we pursue common goals of emission reductions……

Recent EDF Study Updates Emissions Estimates

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" *While distribution systems are not covered in this study, improved science and systematic data collection like this are essential to inform the public debate about methane emissions and to support recognition of the benefits of using natural gas to reduce greenhouse gas emissions and other pollutants.*"

National Grid supports a "Good Science & Common Sense" Approach to Reducing methane emissions

Natural Gas System Methane Emissions *Declining*: Technology and Industry Practices

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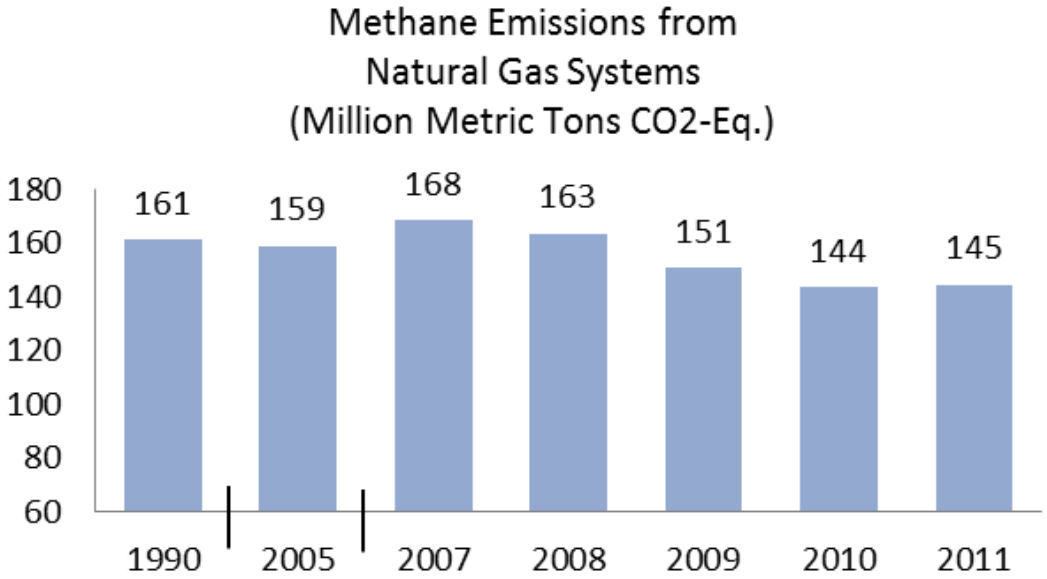

"As an industry, for distribution systems, methane emissions are down 16% since 1990 – while we have added 30% more pipeline main (almost 300,000 miles) and 30% more customers (17 million). This is due to, in part, ongoing efforts by utilities to invest in infrastructure upgrades and employ technological advances. "

MA Total Leak Receipts

Includes All Type 1,2A,2, & 3 Leaks Discovered – Excludes Damages

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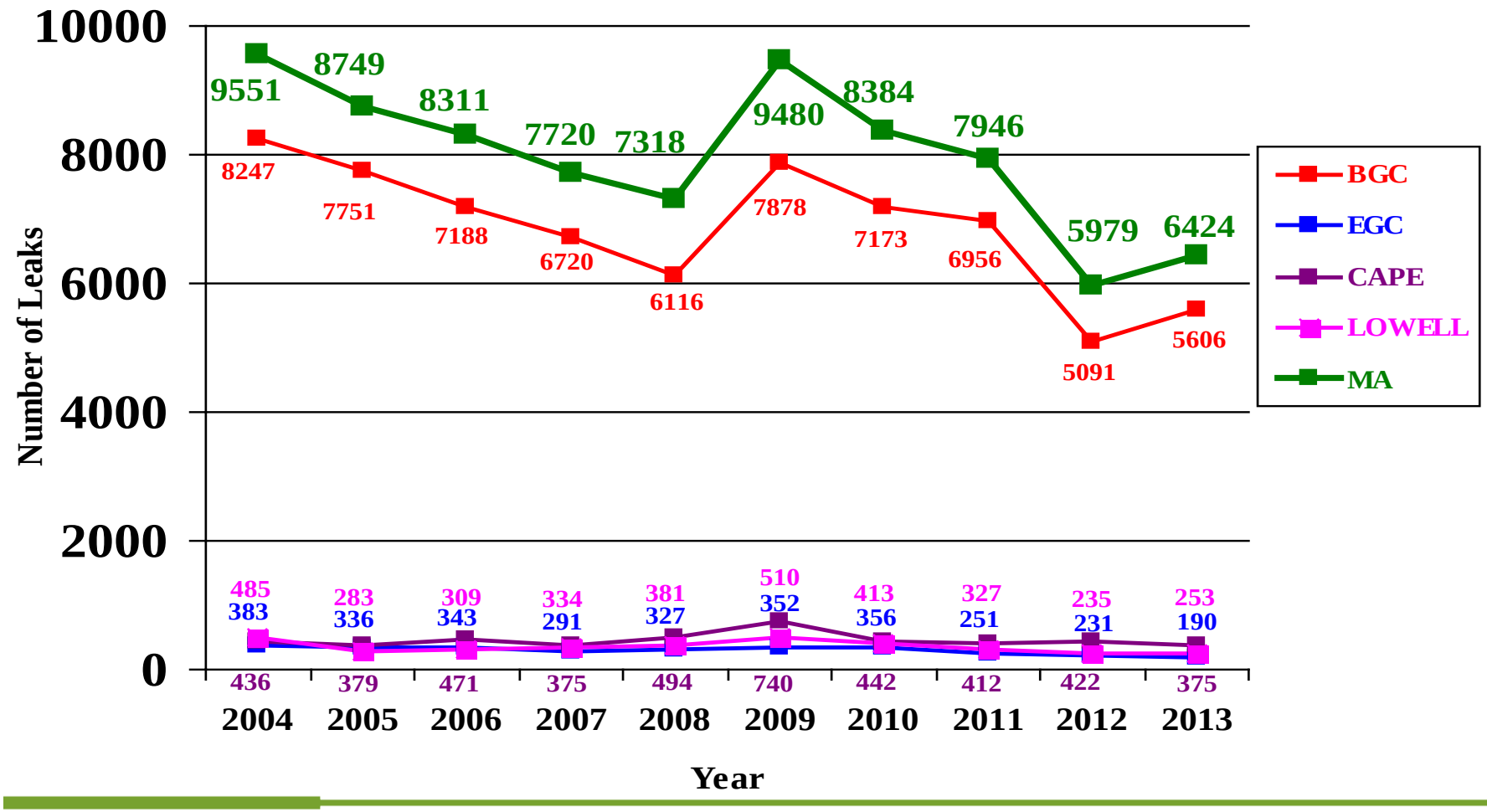

MA LEAK RECEIPTS AS A FUNCTION OF TOTAL SYSTEM PIPE MILEAGE

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BGC	EGC	CAPE	LOWELL	MA
5,606 Leak Receipts	190 Leak Receipts	375 Leak Receipts	253 Leak Receipts	6,424 Leak Receipts
6,324 miles of Main 490,951 Services (4,285 miles)	863 miles of Main 42,887 Services (636 miles)	2,445 miles of Main 111,491 Services (1,585 miles)	1,389 miles of Main 74,672 Services (1,017 miles)	11,021 miles of Main 720,001 Services (7,522 miles)
10,609 total miles of pipe	1,499 total miles of pipe	4,030 total miles of pipe	2,406 total miles of pipe	18,544 total miles of pipe
0.53 Leak Receipts per Mile of Pipe	***0.13 Leak Receipts per Mile of Pipe***	***0.09 Leak Receipts per Mile of Pipe***	***0.11 Leak Receipts per Mile of Pipe***	***0.35 Leak Receipts per Mile of Pipe***

As of 31st December 2013

Where Do We Go From Here ?

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- Continue to focus on ***risk based*** pipe replacement of aging infrastructure as a primary vehicle to minimize emissions
- Risk assessment needs to strike appropriate ***balance*** of safety, customer, regulatory & ***emissions focus***
- Work with all stakeholders including AGA, NGA, EDF & CLF to refine data and science around emission measurement models (emission factors, LAUF estimates etc..).
- Deploy state-of-the-art technology that is fit for purpose to help measure & improve of replacement strategies

Leak Detection / emissions Measurement R&D Opportunities……..

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- Develop “emissions risk factor” using state-of-the-art emissions indication technology based on pipe segments. Quantify effectiveness of pipe replacement focus by direct measurement & continuous improvement (work underway via NYSEARCH collaborative)
- Develop direct measurement technology to assess residue methane from historical emissions from active emission sources

Long Term LDC Emissions Mitigation Strategic Framework R&D

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- Promote & fully deploy existing technology solutions for *rehabilitation* of larger diameter CI systems
- Continue to promote accelerated pipe replacement strategies for unprotected steel, small diameter CI and vintage plastic as the primary vehicle for emission reduction
- Develop an emissions risk factor to help focus replacement strategy when all safety related risks are equal.
- Develop state-of-the-art technology solution to monitor system safety performance during extreme environmental conditions (enhanced winter patrols of CI systems, currently working with Picarro & GTI)

Gut Check……..

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This is one of those defining moments in our industry, and its very rare we have the opportunity we now have before us……..

Working together, Regulators, Policy Makers & Operators are in the best position to make sustainable change a reality by adopting a collaborative, balanced approach to minimizing methane emissions. We need to have the courage to accept a paradigm shift in thinking & actions by deploying a "good science & common sense" philosophy to achieve our parallel goals.