

Safety in the Natural Gas Distribution Industry: A Utility Perspective



NRC Internal Safety Culture Task Force
Panel Discussion
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Tom Valenti
Baltimore Gas & Electric



Natural Gas Distribution Industry Facts

- Natural gas comprises nearly one-fourth (23%) of U.S. energy use (22.4 TCF)
- 20% growth by 2030 projected
- The natural gas industry serves 63 million households and more than 5 million commercial enterprises
- 2.2 million miles of pipeline
 - 1.9 million miles distribution
 - 300 thousand miles transmission
- Over 200 gas local distributors

Natural Gas Distribution Industry Safety Sectors

- Public/Pipeline Safety
 - Integrity of the pipeline infrastructure (keep the gas in the pipe)
 - Design/construct
 - Operate
 - Maintain
 - Damage prevention
 - Emergency response (pipeline incidents)
- Customer Safety
 - Safety “behind the meter” (customer-owned equipment and appliances)
 - Education/awareness
 - Emergency response (customer calls)
- Employee/Contractor Safety
 - Traditional “industrial safety” approach

Natural Gas Distribution Industry

Regulatory Environment

- Gas Transmission and Distribution is Highly Regulated
 - U.S. Department of Transportation > Pipeline and Hazardous Material Administration > Office of Pipeline Safety
 - State agencies
 - Active inspection/enforcement
- Pipeline Safety Regulations
 - 49CFR Parts 191, 192, 193 (for LNG operators)
 - State regulations
- Increased regulatory development in the last decade
 - Operator Qualification (OQ) 2002
 - Transmission Integrity Management (TIMP) 2004
 - Distribution Integrity Management (DIMP) 2009

Natural Gas Distribution Industry Safety Performance

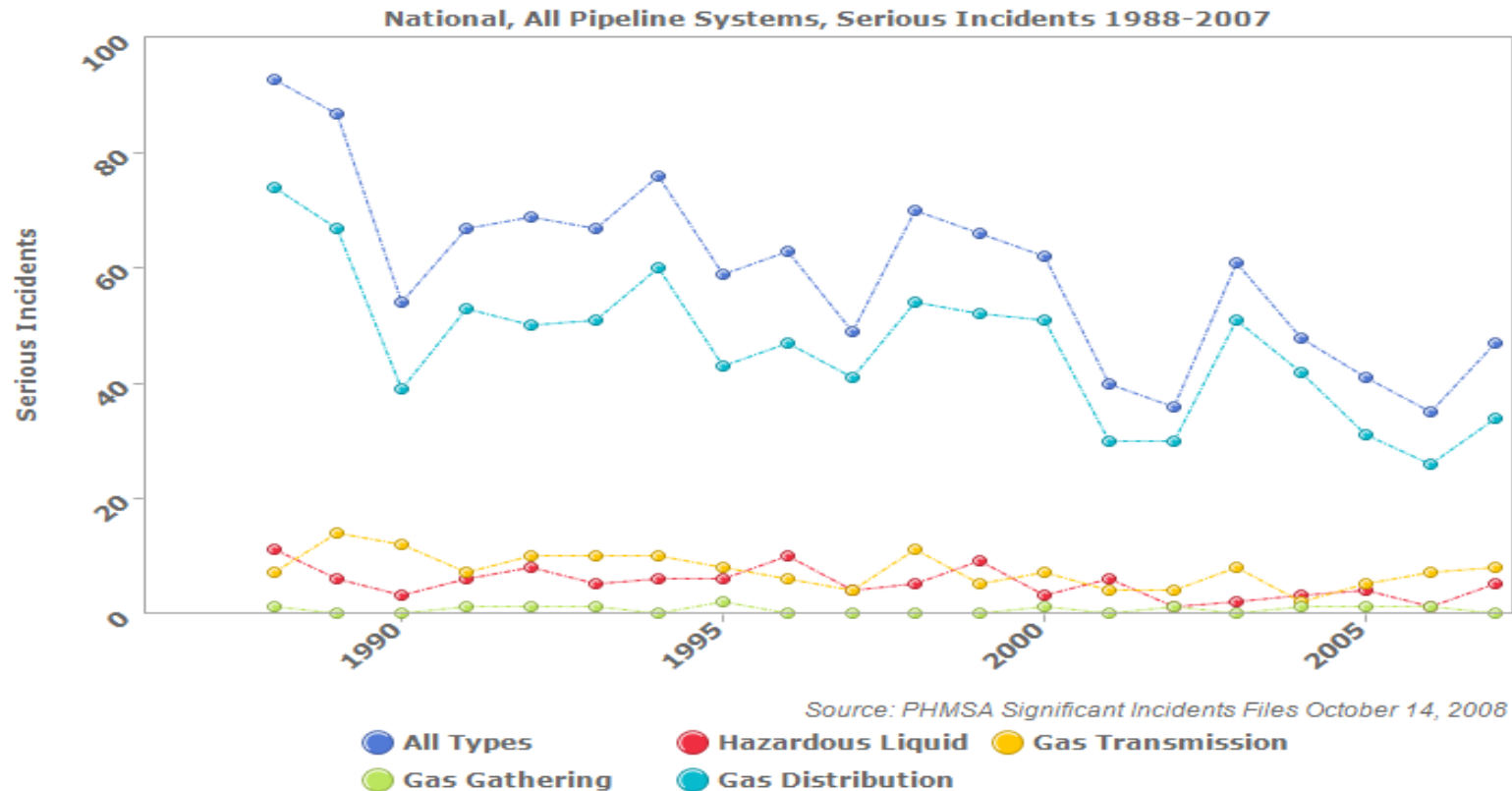
Pipelines are the safest
transportation sector

Transportation Fatalities (2006)	
Highway	42,642
Rail	911
Waterborne	797
Air	766
Transit	213
Pipeline	19

*Source: U.S. DOT Bureau of
Transportation Statistics*

Natural Gas Distribution Industry Safety Performance

Gas distribution pipeline safety performance on an improving trend



Natural Gas Distribution Industry Safety Performance

Natural gas distribution industry employee safety record is similar to other utility industry sectors (except nuclear!), a little better than construction and manufacturing

Source: U.S. Bureau of Labor Statistics

OSHA Recordable Rates (2007)	
All Industries	4.2
Manufacturing	5.6
Construction	5.4
Nuclear Power Generation	0.9
Other Power Generation	4.7
Electric Transmission & Distribution	4.9
Water Distribution	6.0
Gas Distribution	4.7

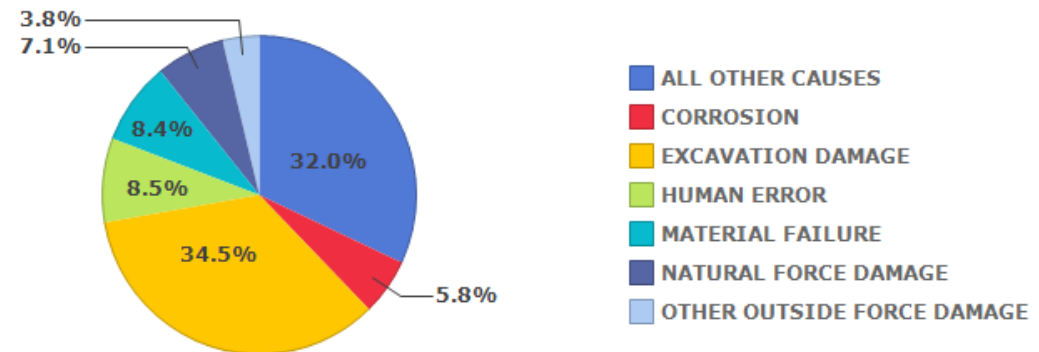
Natural Gas Distribution Industry

Safety Environment, Culture, Challenges

- Public/Pipeline Safety

- Assets/facilities dispersed in uncontrolled environment
- Long-lived assets (legacy materials/construction)
- Prescriptive regulation (TIMP) vs. risk based approach (DIMP)
- Most gas pipeline incidents are caused by third-party damage and outside forces

Serious Incident Cause Breakdown
National, All Pipeline Systems, 1988-2008 YTD



Source: PHMSA Significant Incidents Files October 14, 2008

Natural Gas Distribution Industry

Safety Environment, Culture, Challenges

- Customer Safety
 - A unique responsibility: promoting safety/responding to problems on assets owned by and controlled by others!
 - Gas operator responsibilities:
 - Public awareness/education
 - “Respond and make safe” 24/7/365
 - Employees make public/customer safety decisions on the spot
 - Assessing and grading leaks
 - Stay vs. evacuate



Natural Gas Distribution Industry

Safety Environment, Culture, Challenges

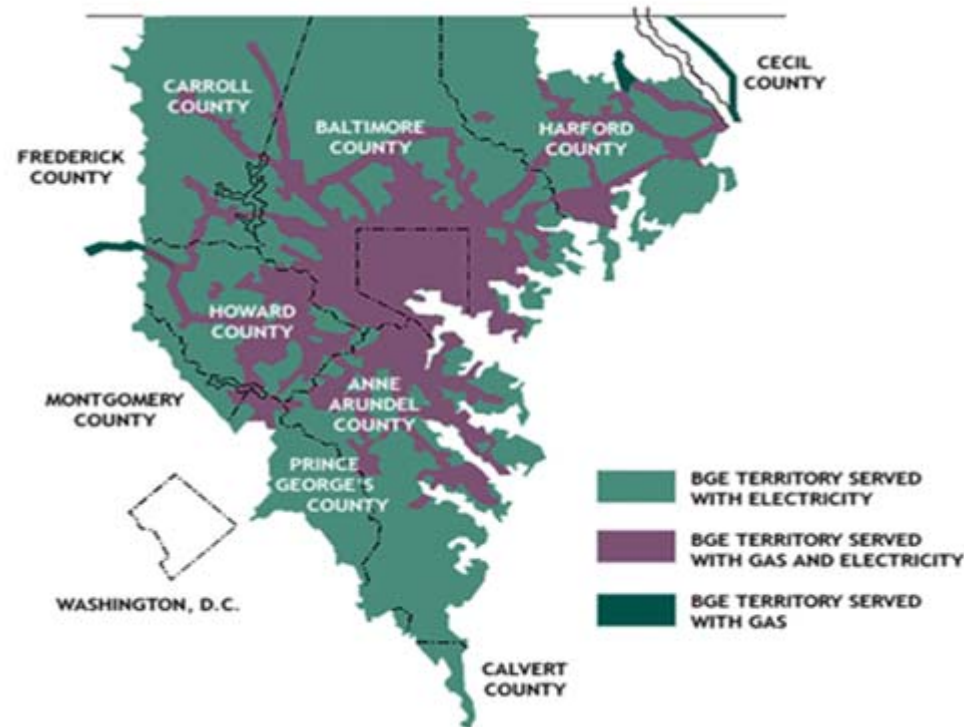
- Employee/Contractor Safety
 - Uncontrolled environment
 - Outdoor exposure: weather/environmental
 - Customer premises: unsafe stairs, bad dogs
 - Driving
 - Job hazard exposures
 - Excavation
 - Work zone safety (working on or near roadways)
 - Live gas operations
 - Emergency response mindset



BGE

Company Overview

- An Affiliate of Constellation Energy
- Electric and Gas Distribution
- Serves Central Maryland
 - 1.2 million electric customers
 - 630 thousand gas customers
- 3300 Employees
- Gas Infrastructure:
 - > 6,600 miles of main
 - >475,000 service lines
 - 9 gate stations connected to 3 interstate pipeline systems
 - 3 peak shaving plants (2 LNG, 1 propane/air)



BGE

Gas Distribution Public/Customer Safety

- Challenges
 - Older materials/legacy infrastructure
- Example Initiatives
 - “Early adopter” approach for new regulations (OQ, TIMP, DIMP)
 - Active in shaping new regulations
 - Start early and take the time to do it right
 - Risk based asset management approach (Optimain)
 - Metrics and performance goals (examples: emergency response, leak management)
 - Emergency response
 - Incident command procedures/training
 - Outage management procedures and system
 - Drills

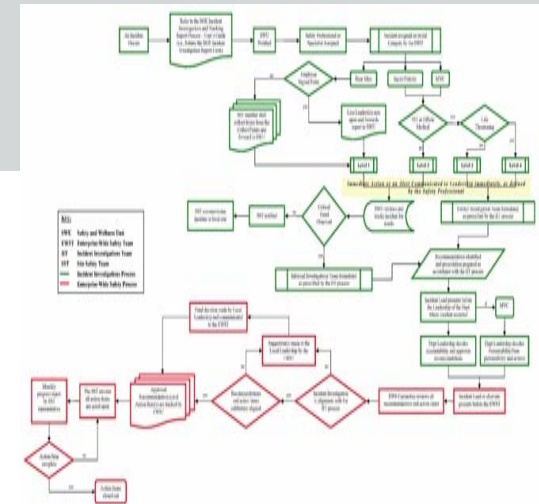
BGE Employee/Contractor Safety

• Challenges

- Same things as everyone else (see slide 10)!
- Aging workforce
- Very difficult driving environment
- Institutionalizing initiatives

• Example Initiatives

- Job Briefing (SAFE.)/Risk Assessment Matrix (RAM)
- Safety Observation (leadership and peer-to-peer based)
- Incident Investigations
- “Level 1” (Near Miss) Program
- Driver Assessment/Retraining
- Training/Evaluation/Qualification (OQ and beyond)
- Coming Attraction: Human Performance



BGE S.A.F.E Form

JOB INFORMATION

DATE: _____ LOCATION: _____

WMS/M Check: _____ CROSS STREET: _____

of TEAMMEMBERS: _____ COUNTRY/CITY: _____

CALL BACK #: _____ JOB DESCRIPTION: _____

ATTENDING #: _____ NEAREST REPORT: _____

STOP - REVIEW JOB HAZARDS AND CONTINGENCY PLANNING

JOB SITE SUPERVISOR & TEAM MEMBERS

L	M	H	Maximum Consequence					
			Minor	Minor to Major	Major	Critical	Catastrophic	
L	M	H	M	M	M	M	M	M
L	M	H	M	M	M	M	M	M
L	M	H	M	M	M	M	M	M
L	M	H	M	M	M	M	M	M
L	M	H	M	M	M	M	M	M
L	M	H	M	M	M	M	M	M
L	M	H	M	M	M	M	M	M
L	M	H	M	M	M	M	M	M

RISK ASSESSMENT MATRIX DEFINITIONS

Low (Green): Start or continue task. Monitor task for changes in risk. If risk increases, STOP and implement control measures.

Medium (Yellow): Implement and monitor risk control measures PRIOR to starting task and proceed cautiously. If control measures prove ineffective or risks increase, suspend or stop task and implement control measures.

High (Red): STOP! (strong) task level. Stop task if risk cannot be reduced to ACCEPTABLE or lower level. STOP and implement risk control measures. If the changing condition STOP task and implement control measures. STOP task if risk cannot be reduced to the level of authority.

Risk Mitigation Strategy: _____

ASSESS - REVIEW WORK PLAN & PROCEDURES

JOB SITE SUPERVISOR & TEAM MEMBERS

DETAILED JOB SCORE / TASK

PPE / Tools & Equipment: _____

Technician / Supervisor / Comment: _____

- Enclosure/Device

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Thomas W. Valenti
Sr. VP – Logistics Management Services
Baltimore Gas & Electric
thomas.w.valenti@bge.com