

Challenges Facing Natural Gas LDCs

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Many of Our Challenges are Well Known

- ◆ **Volatile Gas Prices**
- ◆ **Difficulties in Adding Infrastructure**
- ◆ **Aging Workforce and Infrastructure**
- ◆ **Safety of Personnel and the Public**

But New Challenges Abound

◆Environment/Climate Change

◆Economic Downturn and Credit Crunch

- ◆ Access to capital
- ◆ Increasing Arrears
- ◆ **“Hold the Line” on capital and operating expenses**

◆New Regulations/Regulation

- ◆ DIMP
- ◆ Proposed Mandatory GHG Reporting
- ◆ State Concerns and Agenda



Research can address many of these challenges!

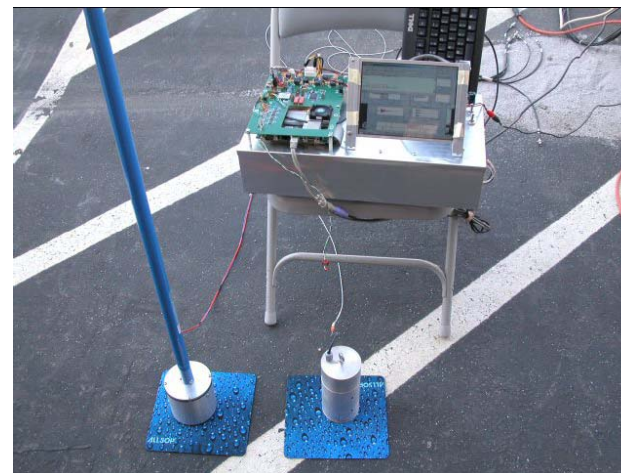


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Our Research Priorities, What's Current, and What should be next!

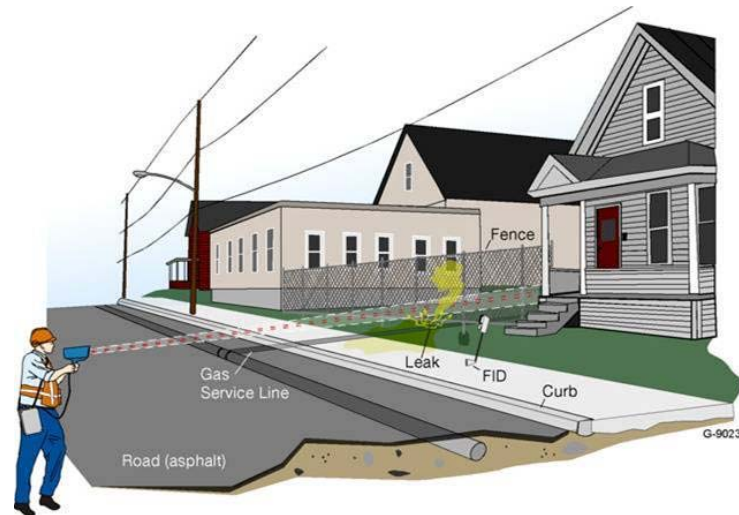
◆ Damage Prevention

- ◆ Advanced locating (Acoustics, GPR, Magnetic)
- ◆ Intelligent Directional Drilling
- ◆ Advanced Threat Detection (geosensors, video recognition)
- ◆ Advanced One Call Coordination
- ◆ What does the future hold???



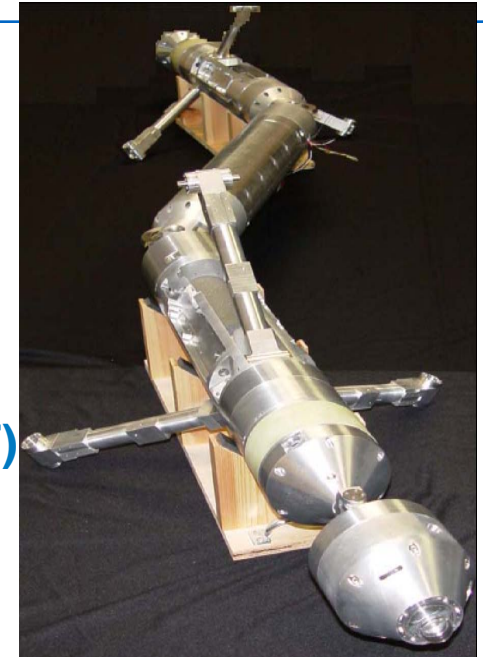
Leak Locating and Repair

- ◆ Lasers to detect leaks
- ◆ Pinpointing using GPS
- ◆ Aerial Surveys
- ◆ Robotic Repair
- ◆ Will the LDC of the future have...
 - ◆ Survey via satellite, self healing pipe, ???????



Maintaining the Integrity of our Transmission Assets

- ◆ **Robotic Anomaly Sensing**
- ◆ **Risk Based Assessment Tools**
- ◆ **Remote sensing (ultrasonics, magnetic fields, EMF)**
- ◆ **What's the next generation?**
 - ◆ New Materials, Composite Pipe, Smart pipe, Nanotechnology



...and Our Distribution System

- ◆ Live Cameras

- ◆ Breaking new ground in Butt and Saddle Fusion Procedures and Testing

- ◆ Polyethylene Pipe Standards, PE repair



- ◆ Cured in Place Liners



- ◆ Inspection of PE pipe

- ◆ How do we address the next challenge?

- ◆ DIMP!!!
- ◆ Control Room Management



LNG Operations

- ◆ Innovative ways to liquefy boil off
- ◆ Innovative ways to “use the cold” available at an LNG plant
- ◆ Salt water ambient heating to assist in vaporization



New Challenges

◆How do We Adapt to Changing Supplies of Natural Gas?

◆How do We Adapt to a changing climate?

◆What might be in our pipes 50-100 years from now?

◆How can we be more efficient?

◆How can we better quantify and then reduce our carbon equivalent emissions?



..Over the Next Two Days.....

.....Think about these issues

.....Think about these technologies

.....Brainstorm in your breakout session

.....Set the course for a new round of research funding!!

Thank You!!!