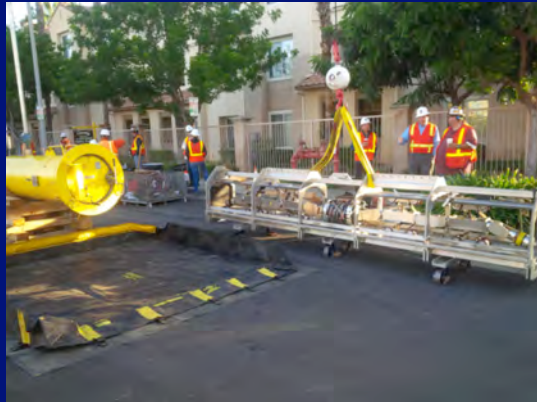
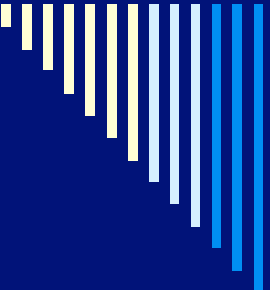


LDC Innovations through NYSEARCH's Voluntary RD & D Program

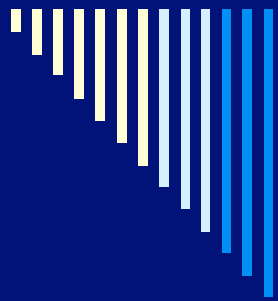


Daphne D'Zurko
Executive Director, NYSEARCH
**Pipeline Safety Trust Annual
Conference**
October 2018



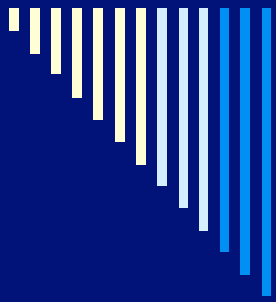
Nature of Voluntary RD & D funded by Gas Local Distribution Companies (LDCs)

- Collaboration among members about needs, applications and challenges
- High leveraging of R & D dollar
- Proactive approach – how can we make things better? How can we apply technologies that others have used to make things safer? How do I best utilize my R & D funds to gain specific company benefits?
- Control of funds; impact on project decisions



Important Areas of Tech Devt for Improving Safety

- ❑ Multi-faceted inspection platforms that do not require shutdown of operation or large/ numerous excavations
- ❑ Advanced warning for activity of threats near pipelines
- ❑ Real-time knowledge of condition of pipeline assets
- ❑ Simplified customer awareness of presence of natural gas



Important Areas of Tech Devt for Improving Safety


- Risk Assessment Techniques
- Innovations in Leak Pinpointing
- Breakthroughs in PE Pipe Locating
- Accurate assessment of Methane Emissions from Non-Hazardous Leaks
- Trenchless innovations; reduced risk with installation of new utilities

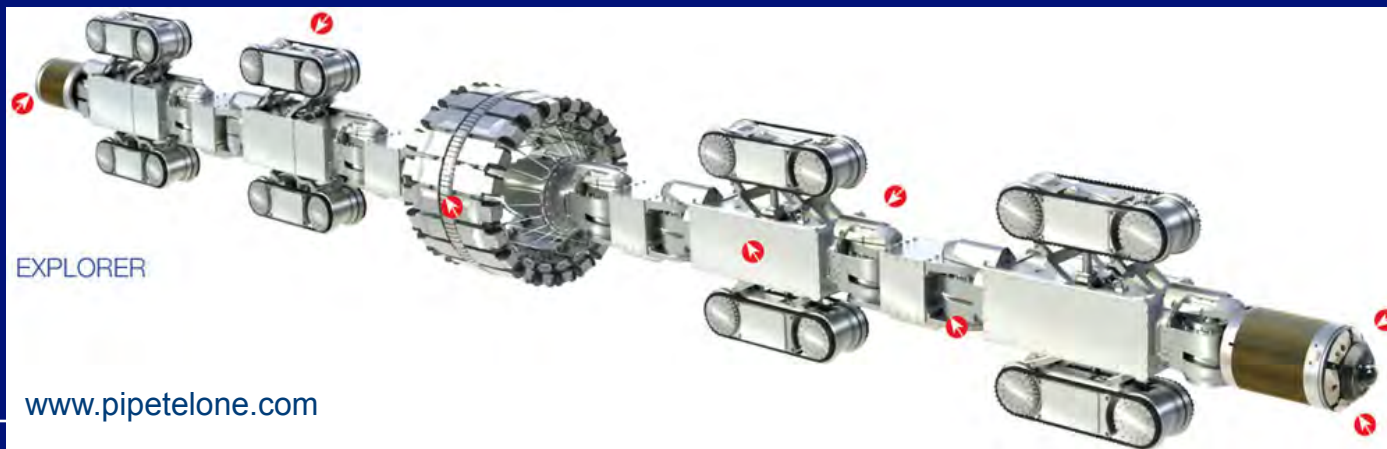


NYSEARCH Program Areas

- Improved Installation, Maintenance and Repair
- Pipeline Integrity/Direct and Remote Assessment
- Pipe Location/Damage Prevention
- Leak Detection
- Real-time Sensing & Inspection for Distribution
- Environment/Reducing GHG Emissions
- Gas Quality
- Evaluation of New Materials

Inspection of LDC-owned Transmission Pipes

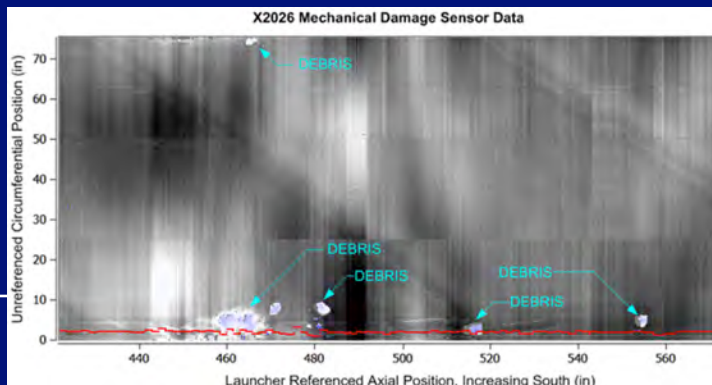
- Have completed all planned Explorer robotic inspection platform sizes for un-piggable pipe
 - 6" – 36" pipeline sizes; up to 750 psig
 - Visual and MFL data; operate thru bends and plug valves
 - Tetherless, battery powered, wireless communication, operation under live conditions 



Supporting Technologies Enhance Inspection

□ Addition of sensing functionality to Explorer platform & expanding robot range

- Mechanical damage/ovality
- Crack sensor (TMFL/EMAT and EC)
- Hardness Tester
- Higher quality data in bends
- Energy Harvesting to reduce power req'ts



Scenes from Commercial Jobs





Over 40
gas
companies
in N.
America
have used
these tools






Technologies Available or On the Horizon

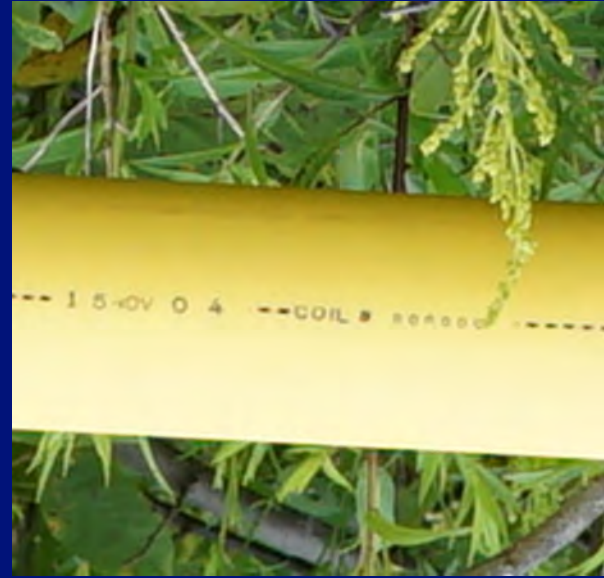
- ❑ CIPP Liners to Rehabilitate Steel & Cast Iron 
- ❑ Live Electrofusion Repair Sleeves for PE
- ❑ Proactive Monitoring/DP Systems for Distribution & Transmission 
- ❑ Real-Time Distribution Sensing Network – GasComm™



Technologies Available or On the Horizon (cont.)

- Tools for Non-Destructive Evaluation PE joints
- Tools for Tracking & Traceability
- sUAS (drones) for inspection & methane detection
- Next Generation Methane Detector for Use in Homes 



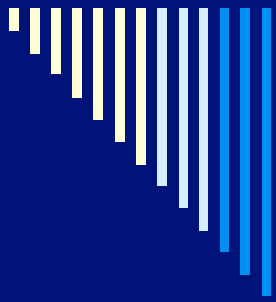


Closing Remarks



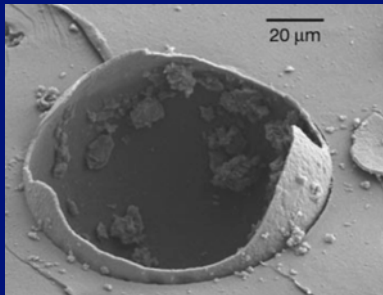
- Many gas companies have been proactive in innovations for safety and integrity
- Implementation and market development of innovations are challenging!





Technologies Under Development

- Inspection of Plastic Pipe – early stage
- Energy Harvesting from Pipelines to power robots & sensors
- Use of Augmented Reality – A/R for Gas Operations training
- Reduction of Emissions by use of catalysts during combustion (replace flaring)
- Application of various forms of RNG



Future

- Exo-Skeletons for Injury Prevention
- Self-Healing Pipe