EPA
United States
Environmental Protection
Agency

Natural Gas STAR Methane Challenge Program

Mitigating Methane from Excavation Damages

May 17, 2017

Outline

- Background
- Greenhouse Gas Inventory Data
- Methane Challenge Excavation Damages Commitment
- Excavation Damages Reporting
- Mitigation Options for Damages
- Considerations/Future Program Options
- Q&A

Natural Gas STAR Program Overview

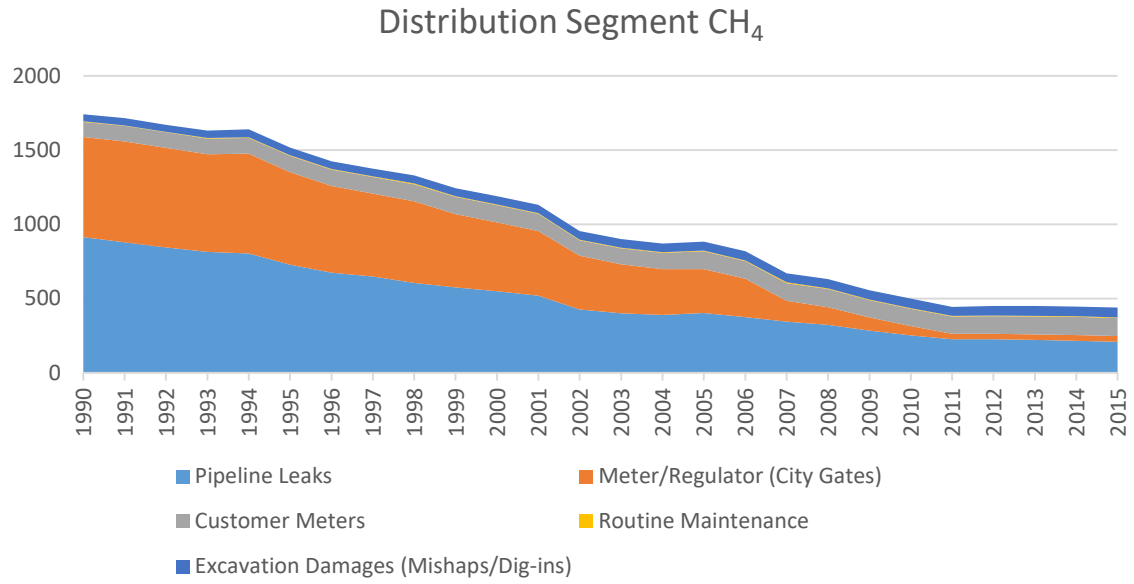
- Started in 1993 to increase awareness of oil and gas methane emission sources and share innovative means of reducing them
- Significant innovation and capacity building achieved over 20+ years
  - Started with six best management practices
  - Now promotes over 50 mitigation best practices
- Partners have collectively achieved over 1.2 trillion cubic feet of methane emission reductions, equivalent to over 606 million metric tons of CO_2 equivalent emissions
- Over 100 partners across the natural gas value chain
- Key goals of technology transfer, training, and capacity building through technical documents and workshops

Methane Challenge Program Overview

- Methane Challenge (MC) expands the Natural Gas STAR Program
  - Specific, ambitious commitments
  - Transparent reporting process, through e-GGRT
  - Company-level recognition of commitments and progress
- To enhance flexibility, EPA offers two commitment options:
  - Best Management Practice (BMP) Commitment
  - ONE Future Emissions Intensity Commitment
- The program covers onshore oil production and the entire natural gas value chain from onshore production through distribution
- Program launched with 41 founding partners March 30, 2016
  - Currently has 52 BMP partners and four ONE Future partners

U.S. Methane Emissions from Distribution Segment

- Distribution Segment CH_4 Emissions
  - Emissions from the distribution segment in the U.S. have decreased over time (~75% from 1990-2015)
  - Large decreases in emissions from pipeline leaks (due to replacement with plastic pipelines) and M&R stations (due to increased LDAR, etc.)



Inventory of U.S. Greenhouse Gas Emissions and Sinks (1990-2015), released April 2017.

U.S. Methane Emissions from Excavation Damages

- Excavation Damages – CH_4 Emissions
  - Method to calculate emissions based on emission factor times pipeline miles, minus reductions reported to Gas STAR
  - Natural Gas STAR partners have achieved over 606,000 Mcf of methane emission reductions from third-party excavation damage prevention since Program inception
- Excavation Damages – U.S. CH_4 Calculation for 2015

	Pipeline Miles	Emission Factor (kg/mile)	Calculated Potential (tons)	Gas STAR Reductions (tons)	Net Emissions (tons)
Excavation Damages	2,190,825	X 30.6	= 67,100	- 846	= 66,245

  - Emissions from excavation damages have increased over the 1990-2015 time series by 40%, while pipeline miles have grown by 42%

Inventory of U.S. Greenhouse Gas Emissions and Sinks (1990-2015), released April 2017.

The MC Excavation Damages Commitment

- Commitment covers distribution mains and services
- Consistent data elements with Common Ground Alliance and PHMSA reporting, however, for Methane Challenge reporting, partners will collect data for *all* incidents (i.e., not just those over a certain threshold) and transparently report on them cumulatively each year
- At this time, the Program does not request quantifications of emissions/reductions from Excavation Damages
- Partner will ultimately use collected data to set goal for reducing excavation damages and/or methane emissions from excavation damages
  - If a Partner has already defined a goal, progress toward this goal can be reported as well
- 22 Methane Challenge partners have made the commitment thus far

Excavation Damages Reporting under MC

Data elements requested for Methane Challenge

- Total number of excavation damages
  - per thousand locate calls
  - per class location (optional)
  - by pipe material (steel, cast iron, copper, plastic etc.) and part of system involved (main, service, inside meter/regulator set, etc.)
  - which resulted in a release of natural gas
  - which resulted in the pipeline being shut down
  - on pipelines or facilities with supervisory control and data acquisition-based systems in place
  - where the operator was given prior notification of excavation activity
  - by type that caused excavation damage incidents
  - by apparent root cause

Voluntary action to reduce methane emissions during the reporting year

- Actions taken to minimize excavation damages/reduce methane emissions from excavation damages
- Company-specific goal for reducing excavation damages and/or methane emissions from excavation damages (when available)
- Progress in meeting company-specific goal (when available)

Excavation Damages Reporting under MC

Example reporting form for the Excavation Damages source (next three slides)

Distribution Excavation Damages

Excavation damages during reporting year	Total number of excavation damages	
	Total number of excavation damages per thousand locate calls	
	Total number of excavation damages which resulted in a release of natural gas	
	Total number of excavation damages which resulted in the pipeline being shut down	
	Total number of excavation damages where the operator was given prior notification of excavation activity	

	Class 1	Class 2	Class 3	Class 4
Total number of excavation damages per class location (optional, if data is available)				

		Main	Service	Inside Meter/Regulator Set	Other
Total number of excavation damages by pipe material and part of system involved	Steel				
	Cast Iron				
	Copper				
	Plastic				
	Other				

Excavation Damages Reporting under MC

Distribution Excavation Damages

Total number of excavation damages by type that caused excavation damage incidents	Contractor	
	Railroad	
	County	
	State	
	Developer	
	Farmer	
	Utility	
	Municipality	
	Occupant	
	Unknown/Other	

Total number of excavation damages by apparent root cause	One-Call Notification Practices Not Sufficient	
	Locating Practices Not Sufficient	
	Excavation Practices Not Sufficient	
	One-Call Notification Center Error	
	Abandoned Facility	
	Deteriorated Facility	
	Previous Damage	
	Other/Miscellaneous	

Excavation Damages Reporting under MC

Distribution Excavation Damages

Voluntary Actions Taken to Reduce Methane Emissions in 2016

Actions taken to minimize excavation damages/reduce methane emissions from excavation damages	
Company-specific goal for reducing excavation damages and/or methane emissions from excavation damages (when available)	
Progress in meeting company-specific goal (when available)	

Additional Information

This space provides an opportunity for reporting optional, qualitative information that was not covered in the above data elements which communicates progress on the applicable commitment.

MC Mitigation Options for Excavation Damages

- Conduct incident analyses (e.g., by identifying whether excavation, locating, or One-Call practices were not sufficient) to inform process improvements and reduce excavation damages, or

- Undertake targeted programs to reduce excavation damages and/or shorten time to shut-in when damages do occur, including
  - Patrolling systems when construction activity is higher, excavator education programs (811, Call Before You Dig),
  - Identifying and implementing steps to minimize repeat offenders, and
  - Stand-by efforts

MC – Considerations/Future Program Options

- Reduce response time to stop flow of gas to affected area after excavation damage
- Increased/increasing penalties for those who cause the damages
- Improved detection and communication of damages
- Increased participation of damage prevention programs

Thank you!

Justin Pryor
U.S. Environmental Protection Agency
Phone: 202-343-9258
E-mail: pryor.justin@epa.gov