

Lessons Learned from an Accelerated Main Replacement Program

OGA Technical Seminar

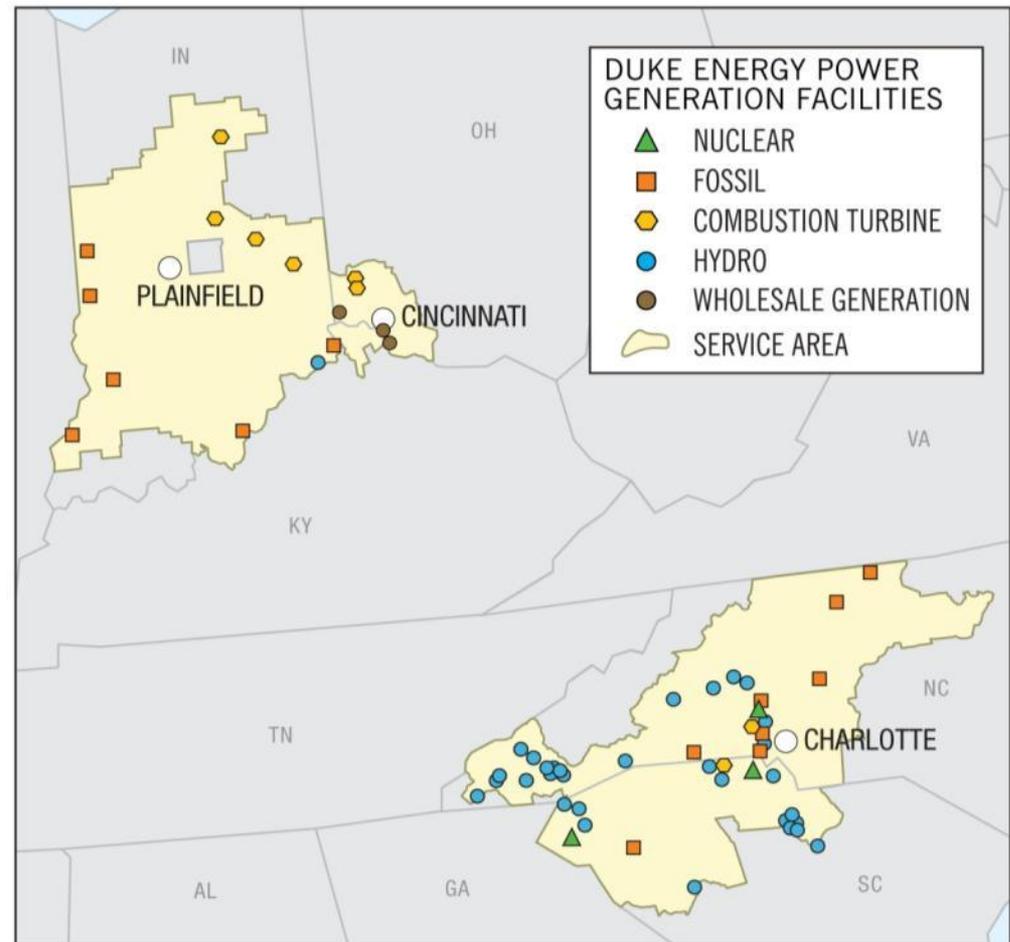
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Topics

- Duke Energy's Background
- Accelerated Main Replacement Program (AMRP) Background
- Rate Recovery Practices
- Engineering Practices
- Construction Practices

U.S. FRANCHISED ELECTRIC AND GAS

- 5 states: North Carolina, South Carolina, Indiana, Ohio and Kentucky
 - Gas Service Territory is in OH and KY
- 47,000 square miles of service area
 - Gas Service Area is 2148 Square Miles
- 500,000 retail gas customers
- 4.0 million retail electric customers



2010 Operating Environment

- 7,176 Miles of Main
 - 6,881 Miles of Distribution
 - 350 Miles of Transmission
- 489,110 Services
 - 6,021 Miles of Service Pipe
- 89.6 Billion Cubic Feet of Gas Throughput
 - Total gas metered & measured at Duke's city gate stations
- System Pressure Range
 - Inches of Water Column to 720 psi
- 513,143 Customers (includes transportation customers)

Accelerated Main Replacement Program (AMRP)

- Began in 2001 with Commission approval
- Replacing 1,421 miles of cast iron & bare steel
 - Replacing 23% of total system main miles
 - Replaces all cast iron & bare steel curb-to-meter services at no cost to the customer

State	Program Duration	Miles to be replaced	Services to be renewed	Estimated Miles Replaced (through 2011)	Estimated Percent Complete (through 2011)	Total Project Cost
OH	15 yrs (2015)	1,212	152,000	949*/997**	78%/82%	\$815M
KY	10 yrs (2010)	209	26,000	209*	100%	\$140M

•*26 miles replaced in 2000 prior to the beginning of AMRP are included in the statistics

•** 48 mile difference between maps and asset records

AMRP Categories

- Cast Iron Maintenance Optimization System (CIMOS®)
- Street Improvements
- Cast Iron – Bare Steel (CIBS)

Cast Iron Main Breaks

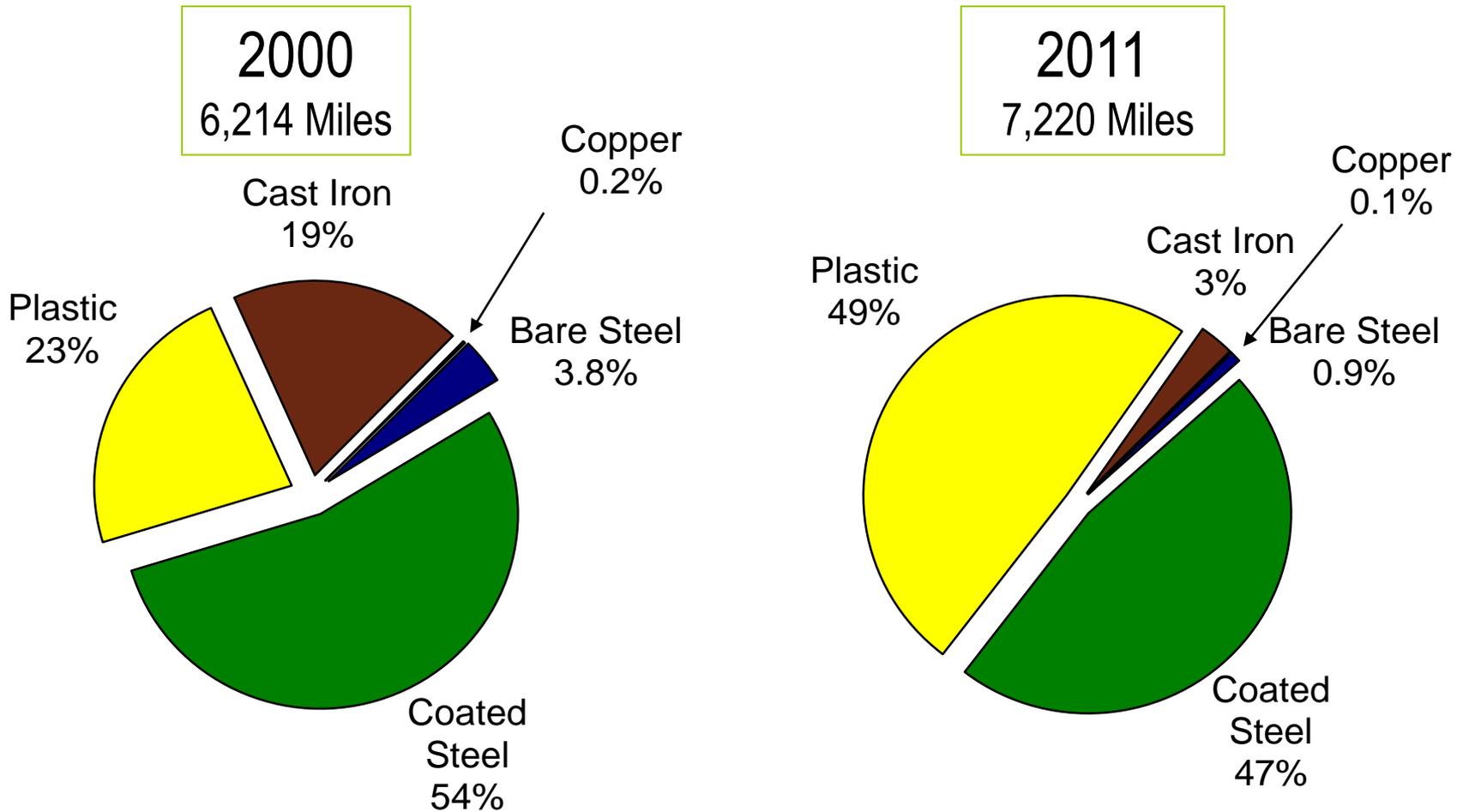
- 100% of all main breaks
- 86% of breaks are on pipe installed after 1947
- 90% of breaks are on mechanical joint pipe

Priorities for Replacement

1. Cast Iron, Mechanical Joint, 5-35 psi main, installed after '47
2. Bare Steel, Inches of Water Column Pressure main
3. Cast Iron, Mechanical Joint, 5-35 psi main, installed '38 –'47
4. Cast Iron, 1-5 psi main
5. Bare Steel, 1-5 psi, 5-35 psi, 60 psi & >60# psi
6. Cast Iron, Bell & Spigot, 5-35 psi main installed after '47
7. Cast Iron, Bell & Spigot, 5-35 psi main installed before '47
8. Cast Iron, Mechanical Joint, Inches of Water Column main
9. Cast Iron, Bell & Spigot, Inches of Water Column main

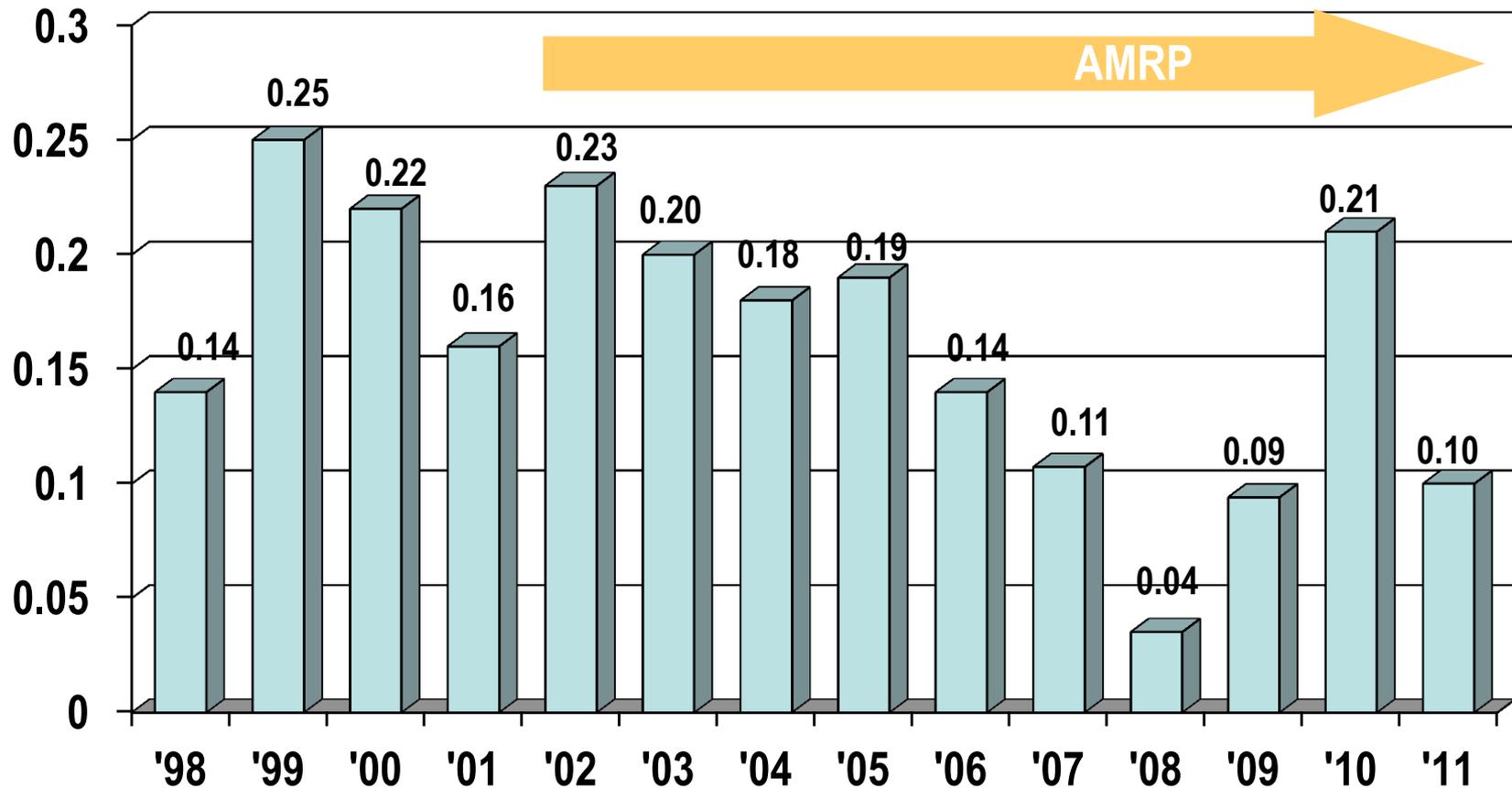
Main Percentage by Material Type

From the start of AMRP through 2011



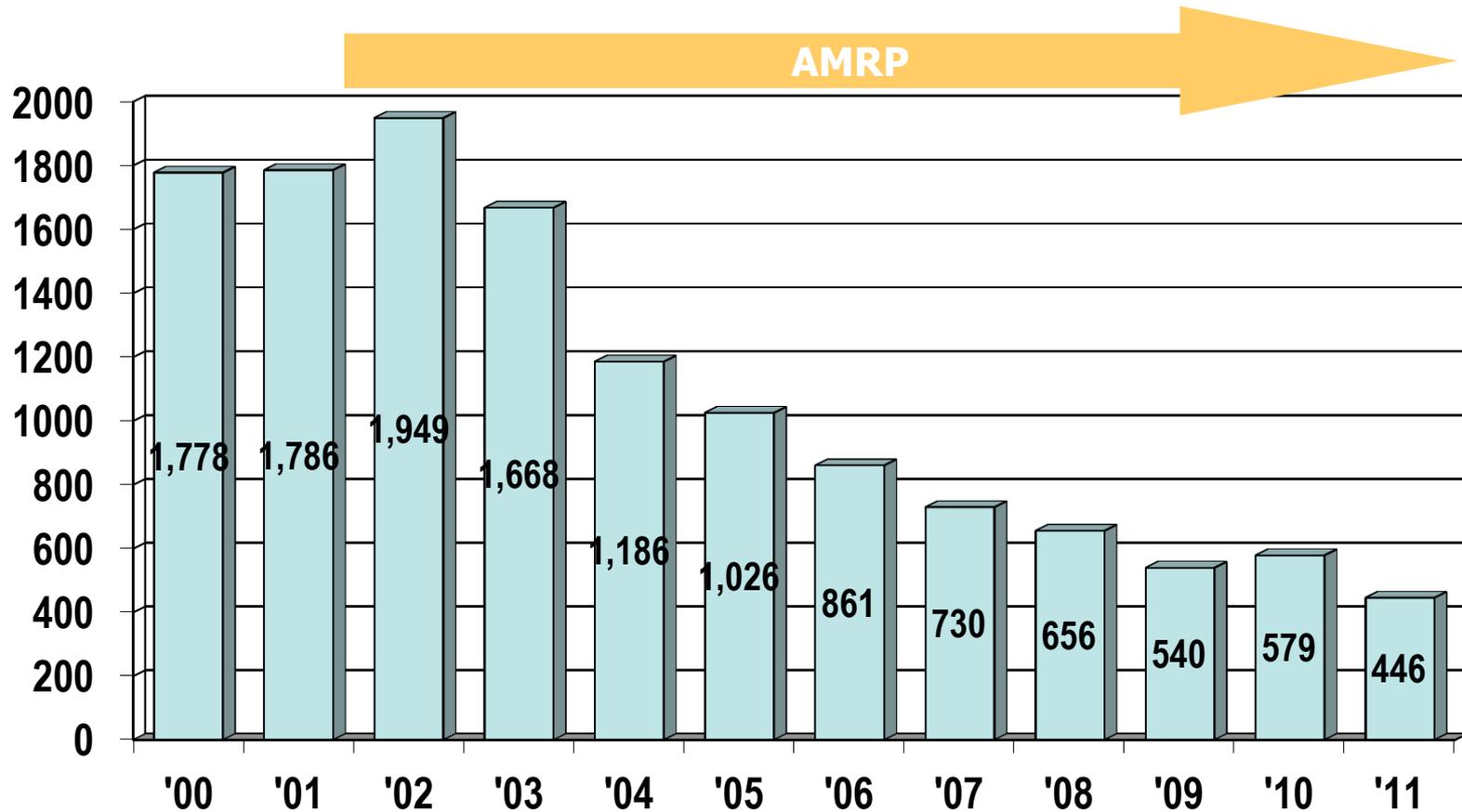
Cast Iron Break Rate

breaks per mile of cast iron main



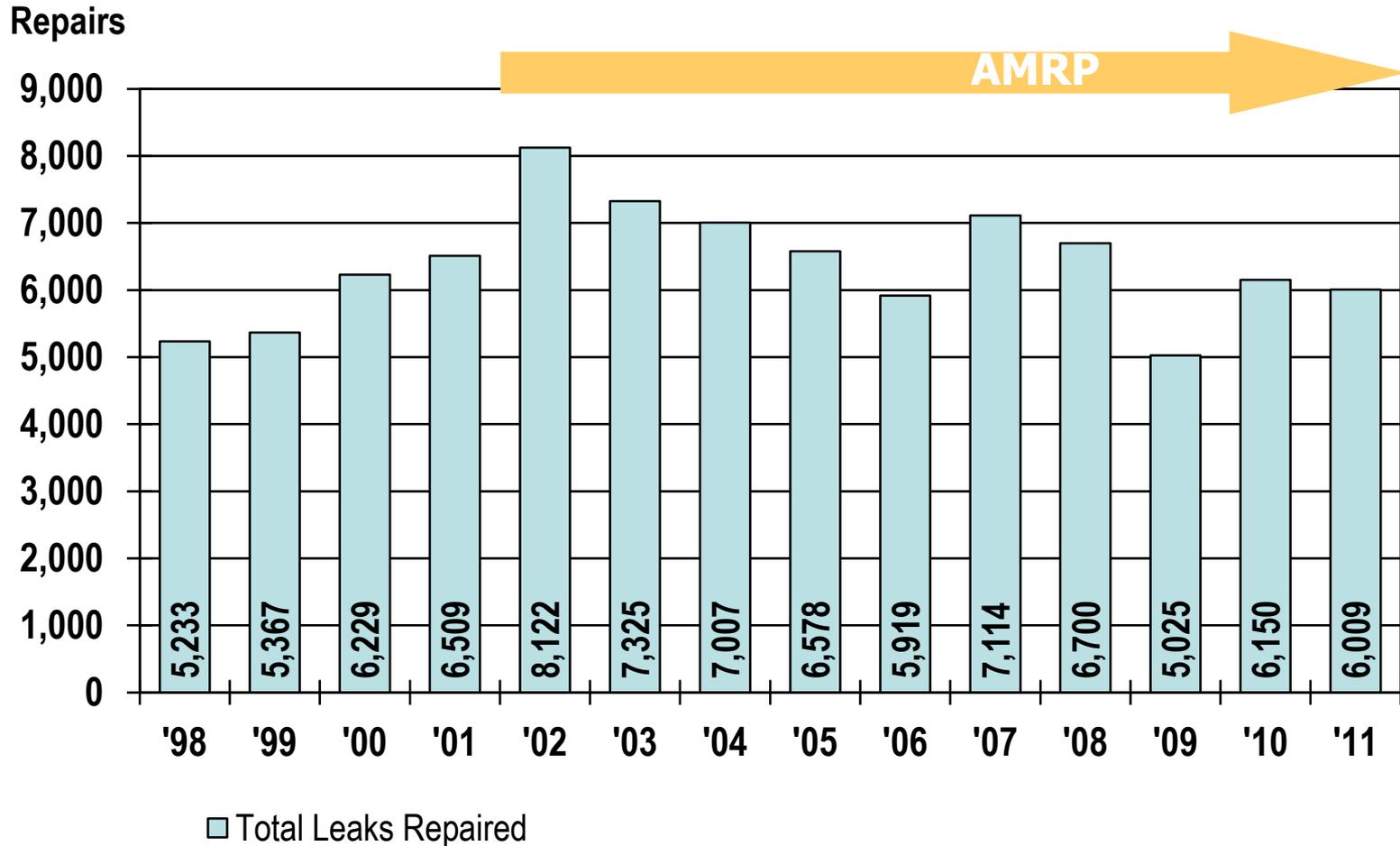
(CI Main 201 Miles)

Total Main Leaks Repaired



Total Leaks Repaired

(mains & services; repairs exclude third party damages)



Rate Recovery

- Reduce Regulatory Lag
 - Tracker Mechanism
 - Cap
 - Annual Filing
- Metrics
 - Capital & O&M Expenditures
 - Work Complete
 - Leaks Repaired
 - Customer Savings

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Engineering Best Practices

Engineering Resource Allocation

- Duke Energy Gas Engineering Scope:
 - System Sizing and Modeling for projects
 - Define Scope of Each Project (Module)
 - Reviews of Engineering Contractor work
 - Route Selection (large diameter)
- Outside Engineering Firms Scope:
 - Surveying
 - Route Selection (small diameter)
 - Permitting
 - Drafting
- Retain at least two engineering firms to ensure continuity
- The Kentucky Commission required that a Kentucky firm be employed

Construction Drawing Production

- GIS employed extensively to lay out and plan projects
- Routing design and drafting done by consultants but closely overseen and checked by Duke Gas Engineering
- Consultants have typically used aerial surveys to speed process
- Consultants employ Duke retirees to perform records retrieval at Duke Engineering office
- 1 year reserve of projects fully designed
- Technology has caught up with the volume of our drawing production

Planning & Material Procurement

- Issue jobs with pressure conversion work early on in construction cycle
- “Right Sizing” modules - 12/31 in service date
- Work with Purchasing to plan out material requirements 1 year ahead
- Material procurement was part of the initial planning stages of AMRP, since material requirements were greatly increasing
 - Reduction in some material costs due to volume
 - Long lead time materials
- The first year or two we had surplus and deficiencies
- Now:
 - Material delivery is staged
 - Contractor storerooms have a 2 week supply of material – retail delivery (Service Material)
 - They order by the box, not by individual item
 - We audit materials in their storerooms
 - Result is better information as to “who has what”

Centralized Operations

- Engineering and AMRP Supervision office proximity – better communication
 - Many specification revisions and process improvements have resulted from this close coordination

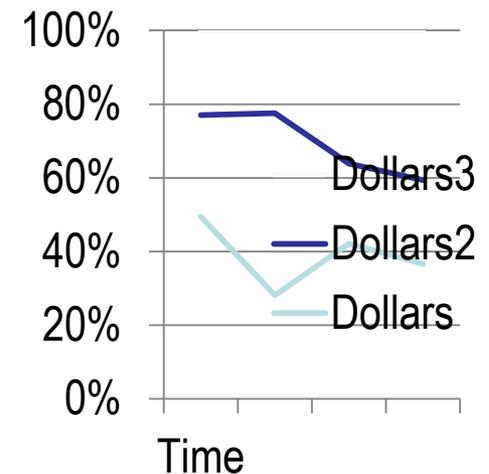
- Monthly Engineering & AMRP Supervision “roundtable” meetings
 - Review issues and concerns
 - Ensures consistency

Outreach with Communities

- Expanded communication with community leaders on the front end
 - Learned their wants and needs for information
 - Spread work over communities/service area
- Consistent approach for handling surface restoration issues/concerns with each community
- Close coordination with communities for infrastructure improvements to minimize disruption and digging into new pavement
 - GIS Maps

Competitive Bidding Process

- Yearly main replacement quantity based upon bid pricing received and what fits into budget
- Capacity of contractors is closely monitored
- Review of procedures & specifications at the annual pre-bid meeting
- Addendums and average pricing history
- Fixed pricing items
- Keep curve level between work and resources



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Construction Practices

Construction Organization

- Manager Contractor Construction
 - 7 Project/Field Supervisors
 - (6) – dedicated to Projects
 - (1) – dedicated to Restoration/Complaint Resolution & Welding
 - 35 USW Represented Employees
 - (30) – Inspecting Mechanics oversee contractor construction
 - (3) – Welders
 - (2) – Tool/Tapping Specialist
 - Long-term plan of reducing AMRP dedicated workforce - working inline with our project conclusion

- Contracting Firms - AMRP
 - 800 to 850 contracting workforce during peak construction

Contractor Performance Measures

- Contractor Management - Responsible for managing the units of construction
 - Dollars vs. Units
- Productivity
 - Contractor Metric Reporting
 - Weekly contractor progress report
 - Weekly contractor projection report
 - Defined Completion Dates
- Quality Control
 - Adherence to Duke Procedures
 - Partnership with Performance Support (Duke Energy Technical Trainers)
- Contractor Scorecard
 - Based on previous years performance, we will increase or decrease the footage a contractor can bid on for the following year.
 - Safety
 - Footage & Services completed
 - The incentive in maintaining strong performance (including good safety record) is long term work .
 - Safety and Quality are the traits of a strong performer

Construction Sequence

- Project Progression
 - Engineering – Feed Issues
 - Municipalities
 - Traffic Concerns
 - School Season
 - Contractor
 - Start Dates & Locations
 - Weekly On-Site Meetings
 - Door hangers, provided by Duke Energy, will be placed on each household, a minimum of 2 weeks, prior to any work in the area.
- Duke Energy Construction and Maintenance (C&M)
 - Weekly Planning and Scheduling Meeting
 - C&M to complete Tie In's
- Teamwork
 - It takes many people working together from project design through build and close out to ensure project success.

Sewer Laterals

- Pre-Camera Inspection
 - Determine best fit for facility location
- Post Camera Inspection
 - Validation before gas facilities is put into service
- Sewer Cleaning
 - Duke Energy Inspector Approved

Sewer Laterals cont.

- MSD Agreement
 - Partnership
 - Use of Existing Sewer Contractors
 - Increased availability of Sewer Contractor Resources
 - Payout/Invoicing for Work Performed
 - 24/7 Information Availability

Safety

- Audit Process
 - Work Site Safety Inspection Report
 - Inspection frequency per Contractor
 - Safety Inspection Reporting
 - Safety Inspection Review
 - Adherence to Duke Procedures
- Contractor Safety Calls
 - Monthly Call
 - Safety Statistics
 - Report Out
 - Incidents & Near Misses
- Safety Improvement Plan
 - Targets for Contractors
 - Discussions with Contractor Leadership
 - Quarterly Safety Summit
 - Monthly Call to Review Procedures

Midwest Gas Operations Contractor Management Work Site Safety Inspection Report

PRINT ALL INFORMATION		N/A - NOT APPLICABLE, A - ACCEPTABLE, N - NOT ACCEPTABLE				
CONTRACTOR CO. NAME		ID	Worksite Protection			
		1	Barricades / 3/4" Plywood / Street Plates (Pinned)	N/A	A	N
		2	Cones, flashers, rotating light	N/A	A	N
DATE OF INSPECTION		3	Means To Call 911	N/A	A	N
		4	Night Work - Adequate Lighting	N/A	A	N
		5	Traffic management/signs	N/A	A	N
CONTRACTOR PERSONNEL NAME (S)		Administrative - I.D. & Qualification				
Supervisor		6	Photo Identification	N/A	A	N
		7	Photo Identification 2nd employee	N/A	A	N
Crew Leader		8	Certification Card	N/A	A	N
		9	Certification Card 2nd Employee	N/A	A	N
Laborer		Personal Protection Equipment				
		10	Hard hats	N/A	A	N
Fuser		11	Safety vests/Shirt	N/A	A	N
		12	Eye/Face Protection	N/A	A	N
Operator		13	Proper Footwear	N/A	A	N
		14	Proper Attire	N/A	A	N
Other		15	Hearing Protection	N/A	A	N
		Work Methods				
		16	Grounding / Bonding Clamps	N/A	A	N
		17	2' rule used	N/A	A	N
		18	10' rule used	N/A	A	N
		68	Follow Established Procedures	N/A	A	N
Location(s) / Job name / Mod		Truck Tools/Equipment				
		19	Condition of Equipment	N/A	A	N
		20	Fire extinguisher	N/A	A	N
		21	First aid kit	N/A	A	N
		22	Wheel chocks	N/A	A	N
DUKE ENERGY PERSONNEL		23	Sling chains/cables/Straps	N/A	A	N
Reported By:		Fusion Equipment				
		24	Butt fusion machines	N/A	A	N
Supervisor:		25	Electro fusion Computers	N/A	A	N
		26	Tools & accessories	N/A	A	N
ID	Comments:	Underground Utilities				
		27	Properly Located	N/A	A	N
		28	Test Holes	N/A	A	N
		29	Sewer locations verified & located	N/A	A	N
		30	Sewer tags verified & documented	N/A	A	N
		Environmental				
		31	Noticeable Spills	N/A	A	N
		32	Proper Hydrostatic Test Water Disposal	N/A	A	N
		33	Silt Fence Utilized Correctly	N/A	A	N
		Trenching/Shoring				
		34	Ladder Used - Ladder on Job	N/A	A	N
		35	Competent Person on Job	N/A	A	N
		36	Area Protected	N/A	A	N
		37	Shoring in Place	N/A	A	N
		Welder				
		38	Welder Certification	N/A	A	N
		39	Welding Shield	N/A	A	N
		40	Pipe Jeep On Site	N/A	A	N
		Restoration				
		41	Temporary Restoration	N/A	A	N
		42	Permanent Restoration	N/A	A	N
		43	Sidewalk Hot Patched & Level	N/A	A	N

Duke Energy Gas Operations – Leading Indicator Report

Gas Ops Safety - Leading Indicator Report Feb-12

Current Month View - Total Gas Ops				
	ID	Feb-12	Feb-11	% Change
No Infractions Percentage	0	98%	94%	✓ 4%
Top Infractions - Current Month				
Cones, Flashers, Rotating Light	2	1	1	! 0%
Traffic Management/Signs	5	3	4	✓ -25%
Wheel Chocks	22	0	3	✓ -100%
Total Infractions		5	25	✓ -80%
Total Audits		205	188	
Infractions per Audit		0.02	0.13	✓ -82%

Current YTD View - Total Gas Ops				
	ID	Feb-12	Feb-11	% Change
No Infractions Percentage	0	95%	89%	✓ 6%
Top Infractions - YTD				
Cones, Flashers, Rotating Light	2	2	5	✓ -60%
Traffic Management/Signs	5	4	6	✓ -33%
Wheel Chocks	22	4	9	✓ -56%
Total Infractions		22	60	✓ -63%
Total Audits		382	338	
Infractions per Audit		0.06	0.18	✓ -68%

Contractors - Monthly Comparisons				
	ID	Feb-12	Feb-11	% Change
No Infractions Percentage	0	97%	92%	✓ 6%
Means to Call 911	3	0	2	✓ -100%
Traffic Management/Signs	5	1	4	✓ -75%
Wheel Chocks	22	0	3	✓ -100%
Total Infractions		3	21	✓ -86%
Total Audits		110	125	
Infractions per Audit		0.03	0.17	✓ -84%

Contractors - YTD Comparisons				
	ID	Feb-12	Feb-11	% Change
No Infractions Percentage	0	94%	88%	✓ 6%
Cones, Flashers, Rotating Light	2	2	5	✓ -60%
Fire Extinguisher	20	2	2	! 0%
Wheel Chocks	22	1	8	✓ -88%
Total Infractions		14	43	✓ -67%
Total Audits		214	108	
Infractions per Audit		0.07	0.40	✓ -84%

Field Ops - Monthly Comparisons				
	ID	Feb-12	Feb-11	% Change
No Infractions Percentage	0	98%	97%	✓ 1%
Traffic Management/Signs	5	2	0	N/A
2' Rule Used	17	0	1	✓ -100%
Vehicle	59	0	1	✓ -100%
Total Infractions		2	4	✓ -50%
Total Audits		95	63	
Infractions per Audit		0.02	0.06	✓ -67%

Field Ops - YTD Comparisons				
	ID	Feb-12	Feb-11	% Change
No Infractions Percentage	0	96%	91%	✗ 6%
Traffic Management/Signs	5	3	2	✗ 50%
2' Rule Used	17	0	4	✓ -100%
Wheel Chocks	22	3	1	✗ 200%
Total Infractions		8	17	✓ -53%
Total Audits		168	130	
Infractions per Audit		0.05	0.13	✓ -64%

Material Management

- Management of Contractors Material
 - Retail Delivery
 - Service Material
 - Pipe Material
 - Project Supervisor Assignment
 - Contractor Headquarter Yard Inspection
 - Project Inspector Assignment
 - Material Accountability
 - Material Reconciliation

Lessons Learned

- Sewer Laterals
- Locating – GPS, tracer wire
- Include relocation of inside meter sets
- Layout conversion program up front (began in 2006-07)
- More robust Community Outreach at start of the program
- Material Procurement
- Solicit input from contractors
- Scheduling Meetings
- “Same Goal”
- Clearly Understand the requirements of your commission
 - Manage the Capital dollars, manage the O&M dollars
 - Customers savings portion

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Questions?