

# Technical Track Session on Direct Assessment: Report-Out

R&D Forum

Houston Texas

March 22 – 24, 2005

# Session Objectives

- Identify Technical Gaps & Challenges from Stakeholder Presentations
- Identify Additional Gaps & Challenges
- Understand the Role of On-Going R&D in Addressing Gaps & Challenges
  - Which are not Completely Addressed?
- Evaluate Priorities for Addressing Remaining Gaps & Challenges
- Roadmap Top 5 Gaps & Challenges

# Process Employed

- Advance survey on DA gaps and challenges by AGA
- Review of plenary session gaps & challenges
- Initial presentations on ongoing R&D
- Open discussion of gaps & challenges
- Group review of consolidated list to identify relevant gaps
- Group ranking of selected gaps (see criteria)
- Limited roadmapping of top 4

# Plenary Session Speakers: DA Gaps & Challenges

- Randy Zobell – Extending Life of Existing Pipeline
- Peter Terranova – Pipe Integrity, ECDA Reliability
- Bill Scott – Improving Ratio of Digs to Pipe Repairs, Improve Knowledge of Impact of Soil Conditions on SCC
- Mary Jane McCartney – Acceptance by Regulator

# Model for Ranking Gaps and Challenges

- **High-High** if group viewed as exceptionally important
- **High** if gap is
  - Critical to effectiveness of early application – reliably identify serious defects
  - Addresses key gap in applicability of process
  - Critical to validation, including clarification of limitations
- **Medium** if gap is
  - Important to refinement of process (e.g., improved efficiency of application)
  - OR High priority BUT programs are ongoing and deliverables are not complete

# Summary Statistics

<u>Ranking (1)</u>	<u>Number of Gaps</u>
High-High	4
High	6
Medium	8

(1) All Gaps are "Above Average"

# “Roadmapping” Questions for Each Priority Gap or Challenge

- What are the R&D objectives?
- What are the potential benefits? To whom?
- What are barriers to implementation?
- What are viable go-forward approaches?

# Gap 1 – Addressing Conditions Where ECDA Application is Challenging

- Cased crossings
- Presence of stray currents
- Deeply buried pipe
- Bare pipe
- Uncased crossings
- AC Corrosion
- Multiple Pipes in ROW
- Station Piping
- Shielding Coatings
- Shielding Soils
- Shrink Sleeves/Shielding Coating Joints



# Gap 1 – Roadmapping (1)

## ■ R&D Objective

- To identify, develop and demonstrate tools and techniques to fill the gaps and expand the applicability of ECDA

## ■ Potential Benefits

- Improve Safety
  - Ability to determine integrity of pipelines that cannot be assessed by other means
  - Addressing segments that are more difficult to characterize
- Improve Cost Efficiency and Reliability
- Remove obstacles to broad application by creating options

# Gap 1 – Roadmapping (2)

## ■ Barriers

- In some cases, technologies are not currently available; in others, validation is not complete
- Inability for current technologies to provide quantitative assessment
- Difficulty of access
- Environment or System Interference

## ■ Candidate Go-Forward Approaches

- Survey existing technologies for applicability and short term potential
- Expand and demonstrate capability and reliability of existing technologies
- Create new knowledge and technology to address the specific problem
- Capture application in standard and/or recommended practice (if necessary)

# Gap 2 Validation of ICDA – All Three Applications

- Dry Gas
- Wet Gas
- Liquid Product

# Gap 2 Roadmapping (1)

## ■ R&D Objective

- To characterize the accuracy and range of applicability of ICDA methods
- To characterize which models apply to what situations

## ■ Potential Benefits

- Improve Safety
  - Improve confidence through better understanding of uncertainties and results
  - Allow operators to gain experience and to improve implementation

# Gap 2 Roadmapping (2)

## ■ Barriers

- Multiple and intermittent historical process conditions
- Incomplete and inaccurate pre-assessment data
- Willingness and ability of companies to participate in validation
- Sporadic and minimal existence of internal corrosion in dry systems

## ■ Candidate Go-Forward Approaches

- Survey existing technologies and methodologies and applicability
- Develop protocols
- Demonstrate ICDA methods (especially wet gas and liquids)
- Perform validation
- Develop standards

# Gap 3 Characterizing the Impact of Uncertainties in ICDA Application

- Elevation profiles
- Data limitations
- Addressing key questions
  - Where do we dig?
  - Length of excavation
- Potential solution area
  - Probabilistic Methods

# Gap 3 Roadmapping (1)

## ■ R&D Objective

- To identify and develop practical approaches
  - to characterize the impact of uncertainties in ICDA application
  - to reduce uncertainties in ICDA application
  - to pinpoint locations and optimize length of excavation

## ■ Potential Benefits

- Improve safety
  - Improve accuracy and cost efficiency of ICDA
  - Create an awareness of uncertainties and potential options to address them

# Gap 3 Roadmapping (2)

## ■ Barriers

- Need for information and technologies to provide accurate depth measurement of deep pipes
- Willingness and ability of companies to participate in validation

## ■ Candidate Go-Forward Approaches

- Survey existing technologies and methodologies and applicability
- Develop protocols
- Demonstrate ICDA methods (especially wet gas and liquids)
- Incorporate into existing standards



# Gap 4 Addressing Conditions Under Which SCCDA is Challenging

- Locating near-neutral SCC
- Station piping & crossovers
- Difficulty predicting occurrence of various SCC with known causal factors
- Candidate Solution Areas
  - Tools or equipment that would improve effectiveness (e.g., tools to locate Shielding coating)

# Gap 4 Roadmapping (1)

## ■ R&D Objective

- To identify, develop and demonstrate tools and techniques to fill the gaps, expand the applicability and improve the ability to detect SCC

## ■ Potential Benefits

- Improve Safety
  - Ability to determine integrity of pipelines that cannot be assessed by other means
  - Addressing segments that are more difficult to characterize
- Improve Cost Efficiency and Reliability
- Remove obstacles to broad application by creating options

# Gap 4 Roadmapping (2)

## ■ Barriers

- In some cases, technologies are not currently available; in others, validation is not complete
- Inability for current technologies to provide quantitative assessment
- Lack of comprehensive data on SCC incidence
- Lack of mechanistic understanding of SCC

## ■ Candidate Go-Forward Approaches

- Survey existing technologies for applicability and short term potential
- Expand and demonstrate capability and reliability of existing technologies
- Create new knowledge and technology to address the specific problem
- Capture application in standard and/or recommended practice (if necessary)