

2003 OFFERING

Internal Corrosion Direct Assessment: Pipeline Integrity Management for Natural Gas Transmission Lines Operated by Local Distribution Companies – Phase Three

The American Gas Association (AGA) and Gas Technology Institute (GTI) have developed a third collaborative research project to help Local Distribution Companies (LDC) who operate high-pressure natural gas transmission lines meet government-imposed regulations. This phase focuses on Internal Corrosion Direct Assessment (ICDA).

On December 17, 2002, the President signed the Pipeline Safety Act, and now regulatory efforts are nearly complete that require that the integrity of natural gas transmission pipelines in High-Consequence Areas (HCA) be assessed on a periodic basis. Internal corrosion must be addressed as one of the seven "time-dependent" threats to pipeline integrity. If one cannot pig or pressure-test for integrity, it is essential that ICDA is confirmed as a validated methodology for LDCs. ASME B31.8S defines the assessment of internal corrosion as "essential" to a prescriptive integrity management plan. It *must* be addressed in the baseline period.

Regulators and others must feel confident that the internal corrosion threat has been adequately addressed by LDCs. Operators must demonstrate that adequate procedures/protocols are in place to address this critical issue in order to be in compliance with the upcoming final Integrity Management Program (IMP) from the Office of Pipeline Safety.

- **Proposed Funding:** \$ 200,000
 - **Required Investment:** \$10,000 per Investor
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BACKGROUND

Phase One of this research collaboration focused on applying External Corrosion Direct Assessment (ECDA) to common assessment situations. The program used ASME B31.8S and NACE RP 0502 to develop an ECDA application protocol that LDCs applied during detailed case studies. The lessons learned were fed back into the protocol, resulting in a comprehensive and user-friendly document with all required forms and checklists to carry out prescriptive ECDA.

The project compiled a detailed list of ECDA service providers, contacts, and integrity management software utilities (i.e., an ECDA "Yellow Pages").

The detailed case studies provided operators with examples they could build upon to apply the ECDA process on their own lines.

Some of the valuable information gained from these studies included:

- The importance of properly overlaying inspection data
- The inspection-tool resolution for each tool under different conditions
- Validation of the indication, severity, and dig-priority-classification criteria developed in the protocol

- The importance of excavations to determine the root cause of defects
- The importance of pre-assessment data throughout the entire ECDA process.

It was identified during this research that the next priority would be the development of procedures/ protocols for Internal Corrosion Direct Assessment. It is recognized that LDCs may operate differently than the assumptions made in NACE TG 293.

VALUE TO INVESTORS

Benefits of the project include:

- **A self-contained protocol to apply ICDA to LDC transmission lines using:**
 - NACE TG 293 (Draft ICDA Practice for Transmission Operators; this is a fluid dynamics approach)
 - Additional protocol items for low flow rates common to LDC transmission lines (using a gravity/elevation approach)
 - Additional protocol items for LDC "wet gas" situations
- **Detailed field examples (case studies) of the ICDA process, which include:**
 - Verification of the methodology and protocol
 - "Templates" for LDCs to apply on their own pipelines
- **Building of confidence with state (PSC) and federal (OPS) regulators:**
 - Inclusion of regulators at the field sites will improve communications and acceptance
- **The receipt of a list/matrix of ICDA service providers and software utilities (i.e., "Yellow Pages" for ICDA)**
- **Coordination with other ICDA research efforts to avoid duplication of effort and maximize benefits to the members.**

PROJECT DESCRIPTION

Research activities are structured into the following core tasks:

- 1. Meet with investors to:**
 - Review scope of work
 - Solicit input from members for selecting internal corrosion case-study sites
- 2. Develop a LDC customized protocol for ICDA:**
 - Based on NACE ICDA RP and ASME B31.8S
 - Develop/revise data forms for indirect and direct examinations
 - Develop an ICDA data element table for the pre-assessment step
- 3. Select detailed case-study sites submitted by volunteer companies**
- 4. Coordinate and witness the application of the new ICDA protocol at each site**
- 5. Analyze and help interpret ICDA results**
 - This will include an evaluation of the prediction software and specialized in-the-ditch tools and procedures (e.g., guided wave ultrasonics, thickness gage, etc.)
- 6. Research and compile an ICDA service providers and software utilities list/matrix, (i.e., "Yellow Pages" for ICDA)**
- 7. Present results at two review sessions (mid-way and at the end of project).**

DELIVERABLES

Deliverables for the project include:

- Self-contained protocol to apply ICDA to transmission lines
- Detailed field examples (case studies) of the ICDA process using the protocol
- "Yellow Pages" of ICDA service providers and software utilities
- Mid-way and final review sessions
- Quarterly and final reports.

TIMEFRAME

The timeframe of the plan is 24 months. The schedule breakdown by task is shown below:

YEAR	2004				2005			
Quarter	1	2	3	4	1	2	3	4
Task 1	■							
Task 2								
Task 3		■						
Task 4			■	■	■	■		
Task 5				■	■		■	
Task 6	■	■	■					
Task 6				■				■

PROJECT INVESTMENT

GTI is seeking 20 participants for this project. With 20 participants, the total project cost will be \$200,000, or \$10,000 per participant over a 24-month period. A minimum of 10 participants is needed for the project to proceed. Since this issue is a high priority of the gas industry, GTI will also be soliciting federal cofunding to double the number of case studies proposed.

CONTACT

Daniel A. Ersoy
 Project Manager
 Gas Technology Institute
 847/768-0663
 FAX: 847/768-0569
daniel.ersoy@gastechnology.org