

REQUEST FOR PROPOSAL

TECHNOLOGIES TO PREVENT DAMAGE ON LOCAL DISTRIBUTION COMPANY FACILITIES

BACKGROUND

NYSEARCH, a voluntary Local Distribution Company (LDC)-controlled Research & Development sub-organization of the Northeast Gas Association, with its (19) members from around North America, is issuing an RFP to look for concepts, technologies and/or products that could serve its members in preventing third party damage to its lines. [More information about NYSEARCH is available at www.nysearch.org or Northeast Gas Association at www.northeastgas.org.]

Based on 2005 DOT data, the gas industry as a whole has over 1 million miles of distribution main, 48% of it is steel, 48% plastic and the remaining in the category of other which includes cast iron and ductile iron. With each year, as networks and new construction expand the systems, more plastic pipe is being introduced.

For the gas industry, one of the most serious problems faced by natural gas companies is damage caused to the infrastructure that is unknown or preventable. According to pipeline incident statistics, the major causes of pipeline failure are punctures by earth-moving equipment or similar outside forces that are not under the control of the pipeline owner or their hired contractor. This type of incident is referred to as third party damage. (Third party damage does not include damage by natural processes such as land subsidence or corrosion.)

Because many contacts made to an underground pipe are a result of improper procedure or risk-taking, they are not always reported and therefore, the problem is potentially larger than what is known. However, there are major efforts afoot by industry, trade associations and inter-industry initiatives, such as the Common Ground Alliance, to raise the visibility of the third party damage problem and to make it easy for contractors, excavators, homeowners and others to call before they dig.

Nationwide, the number of third party damages reported for 2005 on gas pipe was over 25,000¹. Of that amount, over 30% was from a failure of the operator to call the “One-Call” notification center to properly locate the pipe before digging. Another significant cause (over 20%) is ‘excavator practices not sufficient’. Clearly, if the gas operator were aware of encroachment or insufficient practices near their line, they would take action to avoid a damage incident. Therefore, NYSEARCH/NGA is seeking methods for monitoring and preventing encroachment by a foreign source near its distribution pipe.

PROJECT VISION

The proposed program is striving for a product(s) that warns the equipment operator or gas company operator that it is too close to a gas pipe with sufficient time to alter its operation or automatically suspend operation. Such a product needs to work in all types of environments that are typical of distribution pipes, including dense urban areas, and transmission pipes. [It is important to consider and specify what application(s) that the technology could be used for.] In

¹ Common Ground Alliance “DIRT” Report; Analysis and Recommendations – December 2006

order for the product to be accepted and implemented in the field, it will take cooperation between gas, construction and related industries. It is likely that new or changed regulations would be required to cause such a change.

OBJECTIVE

The objective of this project is to develop technology solutions to address third party damage monitoring and prevention on existing and new distribution pipes owned by members and associate members of NYSEARCH/NGA or on existing and new transmission pipes. In order to address the objective, there are some technical goals: 1) To develop or transfer sensor systems that can be used to provide sufficient warning so as to prevent third party damage (or unauthorized interference) on selected sections of gas pipelines (or Right-of-Ways), 2) To provide real time or near real time feedback to the gas company operator as to the source and location of encroachment with detection capabilities that are specific to the application (see below), and, 3) To provide real time or near real time feedback to the equipment operator that it is too close to a gas pipe to provide sufficient time to alter its operation or automatically suspend operation.

INITIAL TECHNOLOGY REQUIREMENTS

While some technologies exist today, NYSEARCH/NGA is seeking innovative development because of several constraints (such as applicability, economics, environment) that make it difficult for any one current option to succeed. A primary requirement is that the new technology is not disruptive and therefore minimizes the need to excavate for installation. [Both excavation frequency and size must be minimized.] Also, in order for automated monitoring and prevention of this type to be feasible to implement in a regulated utility, the system must demonstrate practical economics and minimize the cost per mile of pipe where the system is installed. *This is one reason why the initial objective is to install such a system on SELECTED sections of pipe rather than the entire system.* The monitoring or prevention system must work continuously and be reliable on a 24/7 basis with no impact from weather or other environmental conditions. The sensors need to be durable and have no negative impact on the ability for the facilities to be cathodically protected (by galvanic or impressed current). The system must be able to distinguish benign activity (such as nearby traffic) from potential threats so as to minimize false calls. The system must be tamper-proof and communication must be both secure and reliable. Note that the gas pipe may also be located under layers of asphalt and/or concrete and be in close proximity to underground power lines, steam lines, water mains and fiber optic cable. Finally, because of the existing investment in infrastructure and the need to insure its integrity, the system must be able to be retrofitted to existing and older pipe systems. Initial application specifications for the product(s) described above are:

Distribution Application

- 1) Pipe Sizes: 2” – 12”
- 2) Pressure Range: ¼ psi to 124 psi
- 3) Pipe Depth Range: 2 - 10 feet
- 4) Acceptable alarm distance between third party activity and pipe – 30 feet or less
- 5) Maximum allowable false positives – 1 out of every 100 calls

Transmission Application

- 1) Pipe Sizes: 12” – 36”
- 2) Pressure Range: 124 psi and higher

- 3) Pipe depth range: 2 – 10 feet
- 4) Acceptable alarm distance between third party activity and pipe – 100 ft or less
- 5) Maximum allowable false positives – 1 out of every 100 calls

Note: the above list of requirements should be considered initial targets that are identified to meet the needs of the companies who would sponsor the project.

SUGGESTED WORK SCOPE (COULD BE MODIFIED BASED ON STAGE OF TECHNOLOGY)

Phase 1 – **Economic and Technical Feasibility Study** – With aid from the NYSEARCH Staff, evaluate proposed research in terms of its technical capabilities, member needs and how application of the technology will be economical for use in the gas distribution system or gas transmission system. [**Application should be clearly specified and analyzed.**] Perform technical analysis of potential solutions and barriers to overcome in design. Ensure that components proposed for product are optimized based on application and cost. [Study should include potential commercialization and marketability of product (i.e. cost / benefit analysis comparison to existing products)].

DELIVERABLE – FEASIBILITY STUDY AND COST / BENEFIT ANALYSIS.

Phase 2 - **Proof -of -Concept and Prototype Development** – Develop first version of technology and construct product for field trials. Product should be sized correctly and practical for field application, user friendly, and where possible use commercially available componentry. Test the prototype in a laboratory setting and plan field tests with NYSEARCH and participating utilities. Conduct initial field tests.

DELIVERABLES – FIRST PROTOTYPE(S) AND REPORT ON DESIGN, LABORATORY AND FIELD TESTS.

Phase 3 -**Final Design** - After NYSEARCH review of field tested prototype, incorporate the design enhancements. Resolve all issues related to the design, construction, and commercialization of the product. If necessary, conduct additional field tests with participating utilities. Perform technical analysis of potential solutions and barriers to overcome in design. Ensure that components proposed for product are optimized based on application and cost. [Study should include potential commercialization and marketability of product (i.e. cost / benefit analysis comparison to existing products)]. This analysis would include an updated review of products used by the industry and the target price of the product.

DELIVERABLE - FINAL DESIGN DRAWINGS, SPECIFICATIONS AND DEVELOPMENT/FIELD TEST REPORT

Phase 4 - **Product Development / Pre-Commercial Testing** – Perform development needed to verify capabilities and transfer technology to commercializer. Build pre-production prototypes for longer term field testing. [Number will be based on interest/number of sponsors.] Identify commercializer and develop commercialization plan.

DELIVERABLE - DELIVERY OF PRE-PRODUCTION PROTOTYPES AND COMMERCIALIZATION PLAN

At this time, NYSEARCH is requesting a pre-proposal document.

PRE-PROPOSAL GUIDELINES

A pre-proposal is a document, limited to 2-3 pages in length that provides an overview of an organization's approach to address the proposed damage prevention program for local distribution company facilities. A pre-proposal is part of a two stage solicitation process, intended to reduce the investment required to both produce and evaluate new project concepts. Following selection of the candidates based on pre-proposals, a full proposal will be requested.

PRE-PROPOSAL CONTENT

- a. **Project Description:** Provide a description of the proposed research effort, including the work to be performed. The summary must include a project goal and corresponding primary project objectives.
- b. **Project Schedule:** Provide approximate duration required to complete major project tasks.
- c. **Project Tasks:** Outline and describe major tasks to be accomplished for the successful achievement of the project.
- d. **Deliverables:** List deliverables and duration to achieve each deliverable. Efforts should concentrate on Phases 1 and 2 (Assessment, Feasibility / Basic Research, and Proof - of Concept and Prototype Development). Participant should detail plan for work required for at least those stages (unless others apply).
- e. **Cost:** Provide a description of anticipated costs. This should include total costs as well as an illustration of the underlying assumptions (such as material costs and labor costs) by phase.

PRE-PROPOSAL SUBMISSION

Pre-proposal documentation will be due on **Friday, March 23rd**. If participant is selected for a full proposal they will be notified by **April 23rd**. All full proposals will likely be due on **Monday, May 14th**. NYSEARCH is planning to award contract(s) on July 1, 2007 or later. [Proposal and award dates are subject to change based on proposals received and NYSEARCH sponsor evaluation process.]

Location: In addition to an email version sent to ddzurko@northeastgas.org, a single sealed package, containing the original and two copies of a pre-proposal, must be marked and returned to NYSEARCH at the submission location as follows:

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