



NYSEARCH: Technology Equals Solutions

By John Jackson

NYSEARCH, administered by the Northeast Gas Association, has emerged as a leader in research and development on distribution and transmission integrity management, as well as many other natural gas issues.

“While our name implies the Northeast region and we focused originally in New York, we now serve gas companies from around North America,” says Daphne D’Zurko, executive director of NYSEARCH and vice president of RD&D for the Northeast Gas Association. “Our 20 members are from all over—Canada, the two coasts, the Mountain States. Also, as a contract management organization, we look anywhere in the world to find good technology.

“We identify the collective needs of our members, we find good projects and with the members, we design and agree as a team on the necessary work scope and deliverables. We raise industry and government funding as the needs and benefits justify. With direct oversight and control by the members, the NYSEARCH engineering staff manages the project. Once we complete a product, we license it to a commercializer,” she explains.

In an update of promising distribution and transmission integrity management-related NYSEARCH projects previously highlighted in *American Gas* (see “Technology for a Better Tomorrow,” May 2010), D’Zurko adds to the list an advanced video surveillance technology that can be used to proactively prevent third-party excavation damage. It has been adapted from the defense industry by PL E-Communications, and it allows operators to remotely monitor “hot-spot portions of pipeline rights-of-way that have been identified as being especially vulnerable to outside-force damage.”

The cameras, which are mounted on utility poles or portable tripods and scan a specific hot-spot area, are linked to a

► An example of a video surveillance camera test installation. The camera can be used to proactively prevent third-party damage.



◀ A selected test in the NYSEARCH plastic pipe program for evaluating the effectiveness of an ultrasonic test technology in examining defects in PE joints.

PHOTOS PROVIDED BY NYSEARCH

system that is able to distinguish between benign movements and potential threats to the pipeline. “We’ve identified threats of interest to the companies, we’ve prioritized them and we’ve done a lot of testing to ensure that these threats can be picked up—for example, a backhoe going into an area as opposed to a truck passing by,” D’Zurko explains.

“There’s a specific signature that’s recognizable in the change of pixels in an image,” she continues. “The innovation is in the processing of the images and the identification of a threat that then sounds an alarm. It’s all in the algorithms.”

The system is showing a very high accuracy rate, D’Zurko reports. “Now we’re optimizing equipment so we have the same accuracy with smaller units that don’t require as much power,” she says. NYSEARCH is also evaluating and developing other similar systems with different methodologies and economics to proactively monitor for potential third-party damage.

NYSEARCH also is evaluating a Russian inspection technology from TransKor-K in Russia and provided by TransKor-USA called “magnetic tomography,” a passive electromagnetic technique that measures the change in material properties, which usually presents itself as a stress or strain. Scanning is done by means of sensors contained in a box carried by an operator walking the line.

“The technology is not measuring physical features that indicate metal loss; it’s actually getting at the material stress

in the pipe,” D’Zurko says. She notes that the technology has some limits: it can’t be used in areas with electromagnetic interference, for example overhead power lines, and it can’t be used on pipe that has undergone an in-line inspection with MFL sensors until approximately two years after the pigging is completed because of residual magnetization.

D’Zurko explains that magnetic tomography has been used on more than 7,200 miles of natural gas and oil pipelines in Eastern Europe and Asia. “We’re the first organization to independently evaluate the technology at multiple diverse sites in the U.S. gas industry,” she says. “Our group of funders has not completed the statistical validation of the results, but initial conclusions are that the technology is promising.”

Another innovative technology listed by D’Zurko is a non-destructive tool being developed by The Welding Institute (TWI) based on new European technology that examines butt fusion and electrofusion joints in polyethylene (PE) pipe. The project builds on ongoing and past research for the European gas and PE piping industries.

“NYSEARCH is getting into the realm of better defining the quantitative measures that tools need to have so we can have both accurate and non-destructive means of checking the integrity of joints on plastic pipe,” D’Zurko says. “So first we’re defining the parameters of good joints and then with those definitions we’re evaluating and developing tools that have been proven for other applications.”

A NYSEARCH product that has recently been in the news and referenced in various industry discussions and conferences is the Explorer II Unpiggable Inspection Platform. The product for 6" and 8" pipe diameters was commercially released late in 2010 by PipeTel Technologies Inc., a subsidiary of Invodane Engineering, NYSEARCH’s commercial licensee for the product. Other sizes will also be released in 2011, and the NYSEARCH robotic platform for larger un-piggable lines of 20" and higher is expected to be released in 2012. ⚡

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More information on integrity management R&D is available from the following sources:

U.S. Department of Transportation’s Pipeline and Hazardous Materials Safety Administration <http://primis.phmsa.dot.gov/matrix>

Pipeline Research Council International (worldwide research organization made up of pipelines, vendors, service providers, equipment manufacturers and others) <http://prci.org>

Operations Technology Development Corp. (membership-controlled R&D partnership of U.S. natural gas utilities) <http://otd-co.org>

Gas Technology Institute www.gti.org

NYSEARCH www.nysearch.org