

# Providing effective asset management solutions

by Bob Baxley, Manager, MISTRAS Pipeline Centre of Excellence

As pipeline systems begin to age, effective asset management becomes increasingly important to ensure safety and continued operation. Bob Baxley provides information on some of the asset protection and management tools available in MISTRAS' full range of product and programs.

In an industry roundtable discussion a few years ago, a pipeline industry veteran noted that while pipeline owners and operators tend to spend heavily on regulatory compliance improvements and initiatives, less money is available for proactive, reliability-based maintenance work. Another expert went a step further, saying that while condition assessment is hugely important, a pipeline management program should include four activities: condition assessment, monitoring, prevention, and maintenance.

The key is the integration of each of these functions. Disparate pipeline management can result in disorganised information and an incomplete non-destructive testing (NDT) toolbox, ultimately leading to considerably higher costs and safety risks. MISTRAS offers a cohesive asset management program that encourages the four activities to complement each other. This answers both of the speakers' dilemmas: pipeline operators can stay in compliance and proactively maintain and monitor reliable assets, without the need to spread financial resources across separate entities.

MISTRAS uses industry experts and leading technologies in every phase of pipeline management, from new construction to integrity management projects, simplifying the process for pipeline owners and operators. Its integrated pipeline management program incorporates equipment and services solutions for NDT inspection, monitoring, maintenance, and engineering, including: access to multiple testing methods, condition assessments in hazardous or hard-to-reach areas, pipeline maintenance, and products and systems for unattended asset monitoring.

## CRAWLER TECHNOLOGY

As part of its full complement of NDT



inspection techniques, MISTRAS uses a variety of crawler technologies to conduct inspections on newly constructed pipelines. The crawlers use ultrasonic (UT) or radiographic (RT) arrays to inspect for corrosion and other anomalies.

Among its range of RT crawlers, the company's internal X-ray crawler services produce high quality panoramic radiographs of circumferential butt welds in new pipelines from 6-72 inches in diameter. MISTRAS has also designed, developed, and manufactured the automated radiographic testing (ART) crawler, a corrosion-under-insulation (CUI) detection tool applicable to any aboveground pipeline in the diameter range 8-42 inches.

MISTRAS' automated UT (AUT) crawler services are able to identify, locate, and size

defects in girth weld materials. AUT technologies can utilise time-of-flight-diffraction (TOFD), phased array, and P-Scan techniques for a variety of applications and damage mechanisms, including corrosion and cracking. With this technology, the company's technicians can help monitor discontinuities over successive inspection intervals, calculate growth rates of discontinuities, and plan repair or replacement activities.

## UNMANNED INSPECTIONS

Unmanned aerial systems (UAS), or drones, have experienced an ever-expanding range of uses in the pipeline industry. Outfitted with high-resolution cameras and a variety of testing and sensing tools, MISTRAS – and its drone inspection brand, AETOS – use drones as a



**A:** The PIMS remotely informs pipeline operators of asset conditions from difficult-to-access or hazardous locations. Mistras' **B:** ART Crawler can be used to detect corrosion under insulation.

*Many pipelines have to contend with inclement weather and harsh environmental conditions which creates prime conditions for both internal and external degradation.*

cost-effective, safe, and quick solution for new construction and existing pipeline surveys, geological mapping, and pipeline right-of-ways.

Drones are far less expensive than helicopters and can fly and hover closer to pipelines than helicopters, increasing visibility of flaws that may otherwise be too small to detect. In the hands of a certified drone pilot, like those at AETOS, the technology is useful in areas where it is impossible to deploy technicians in traditional vehicles for the right-of-way.

Survey data and imagery is able to be recorded and archived, providing an additional layer of information to inspectors and operators that is unavailable from existing methods. MISTRAS can also use drones in case of emergencies to quickly locate hot spots and hidden leaks, providing real-time spill monitoring, images, and video to operators and inspectors.

Recently, AETOS was awarded third-party accreditation from the National Unmanned Aircraft Systems Certification Program (NUASCP), certifying that AETOS has achieved high standards of safe and effective drone operations. AETOS was the seventh company in the US to receive this certification, which serves as an important industry differentiator for oil, gas, and petrochemical companies.

## MONITORING IN HAZARDOUS LOCATIONS

Buried, subsea, or sleeved pipelines are often not inspected as frequently as they should be, due to the costs associated with accessing their locations, or an unwillingness to take lines out of service. Permanent, unattended monitoring solutions – such as MISTRAS' Permanently Installed Monitoring System (PIMS) and CALIPERAY™ remote thickness tracking device – solve this problem, by allowing operators to stay informed of asset conditions at any time from a remote location.

PIMS utilises an encased guided wave ultrasonic (GUL) transducer to detect defects in buried, subsea, and sleeved pipelines, along with those in contaminated locations. Capable of identifying changes of less than 1 per cent in pipe cross-sections, PIMS presents results in a C-scan style display, accurately identifying defect locations.

The CALIPERAY™ system is effective for highly corrosive piping systems. It monitors corrosion and erosion levels on pipe walls, remotely transmitting up-to-date wall thickness data back to operators.

PIMS and CALIPERAY™ are effective supplements to a pipeline predictive maintenance

program. They are able to ensure that the cracking, corrosion, and erosion that often goes unnoticed in these harsh environments is detected and located immediately. This keeps costs and safety risks down, by allowing operators to address damage before it worsens.

## MAINTENANCE

Even with good quality inspection and monitoring programs, corrosion and other defects are inevitable. Especially in the oil and gas, and petrochemical industries, extremely hazardous and corrosive materials flow through pipelines in huge volumes. Many pipelines have to contend with inclement weather and harsh environmental conditions which creates prime conditions for both internal and external degradation.

The Nacher Corporation, a MISTRAS member company, specialises in maintenance solutions for both onshore and offshore pipelines. The company uses expert technicians with certifications in surface preparation, corrosion, insulation, and cathodic protection to provide a full range of insulation and remedial coating services, on top of its advanced inspection and mechanical integrity service lines. Nacher employs both traditional and advanced methods of surface preparation, including proprietary methods of ultra-high pressure (UHP) water blasting.

## VALUE OF INTEGRATION

MISTRAS' program integrates solutions throughout the entirety of a pipeline's lifetime, from new construction all the way through pipeline integrity. The value of this is clear: utilising individual contractors for each phase of pipeline management isolates information and data that provides far greater value when analysed together. Inspection data on a newly built pipeline must necessarily inform pipeline integrity personnel working on the line years later. Disconnecting this related data increases the risk of missing potential threats, resulting in higher safety risks, and higher costs.

MISTRAS' value-added, one-source program provides the solution: an integrated, one-stop shop from start to finish. With multiple testing and deployment methods at every phase, MISTRAS has an answer for any pipeline problem. **P**