

Technology identifies corrosion in hard to inspect pipelines

Corrosion poses a significant threat to most pipeline operators in the industry. If not detected, monitored, and mitigated, it creates irreparable damage. ROSEN pursues a holistic approach to pipeline corrosion management that goes far beyond mere inspection.

With one of the largest fleets of highly innovative metal loss detection systems in the industry, combined with first class engineering consultancy and data management competence, ROSEN provides operators with comprehensive support in managing the risk presented by the ubiquitous threat of pipeline corrosion.

Working with pipeline operators worldwide and having first-hand knowledge of the wide variation in the condition of their pipelines, ROSEN Australia Director of Business Execution Daniel Schneke tells *The Australian Pipeliner* that the company has a big-picture mindset to maintaining asset integrity.

The ROSEN Group has adopted an integrated framework approach for pipeline integrity management. This approach is adaptable not only to each type of threat, but also to each individual pipeline and operator.

It consolidates industry best practice and the most advanced inspection solutions, together with the knowledge of a multi-disciplinary team of subject matter experts distributed around the globe. It is a systematic approach, effective in managing even the most challenging forms of metal loss, fostering a close integrity management partnership where all stakeholders understand the objectives and their role.

"For more than 41 years, the ROSEN Group has delivered inspection and integrity services to pipeline operators around the world. Technology, innovation, and service excellence have made ROSEN the leading pipeline inspection provider with operations in more than 120 countries," Schneke says.

He says since the introduction of inline inspection tools (ILI) more than 50 years ago, there have always been pipelines that were considered un-piggable. Typically, it is a combination of various circumstances relating to pipeline design, operating conditions, and/or characteristics of the medium that prevents a successful inline inspection using traditional methods.

However, ROSEN refuses to accept this as a fact, and have dedicated an entire diagnostics division to finding ILI solutions for challenging pipelines.

"ROSEN has benefited from partnering with KTN, a Norwegian company that is now part of the ROSEN Group to work closely on further developing a full range of crawler solutions, which do not only have benefit from the broad range of sensor technologies that we can attach to the crawlers, but they also have different propulsion mechanisms for all types of scenarios," he says.

ROSEN offers a portfolio of tethered ILI solutions for the inspection of pipelines that require unconventional inspection techniques. Assets are deemed un-piggable, or difficult-to-inspect, due to a combination of challenges typically related to design, operating conditions, and/or characteristics of the medium.

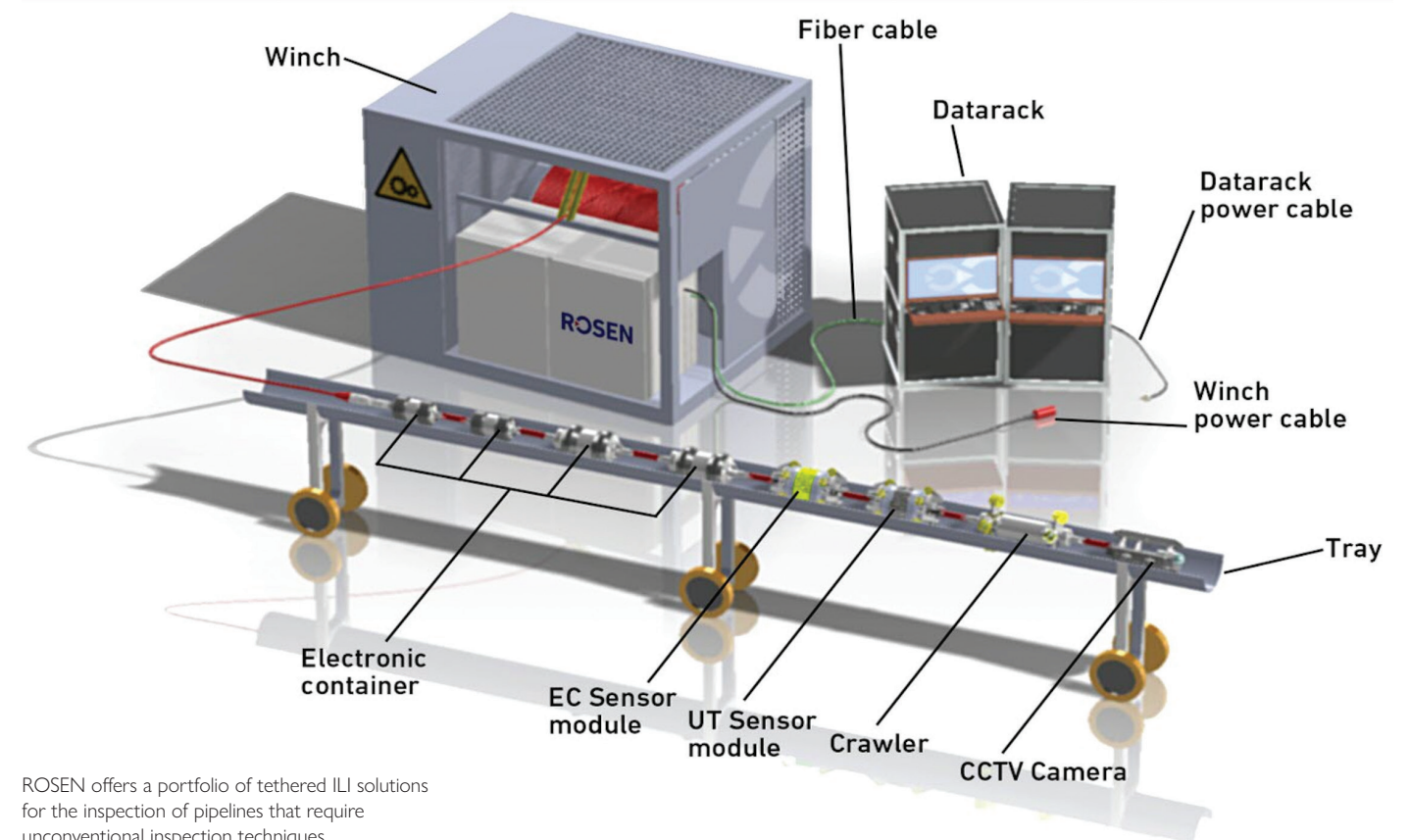
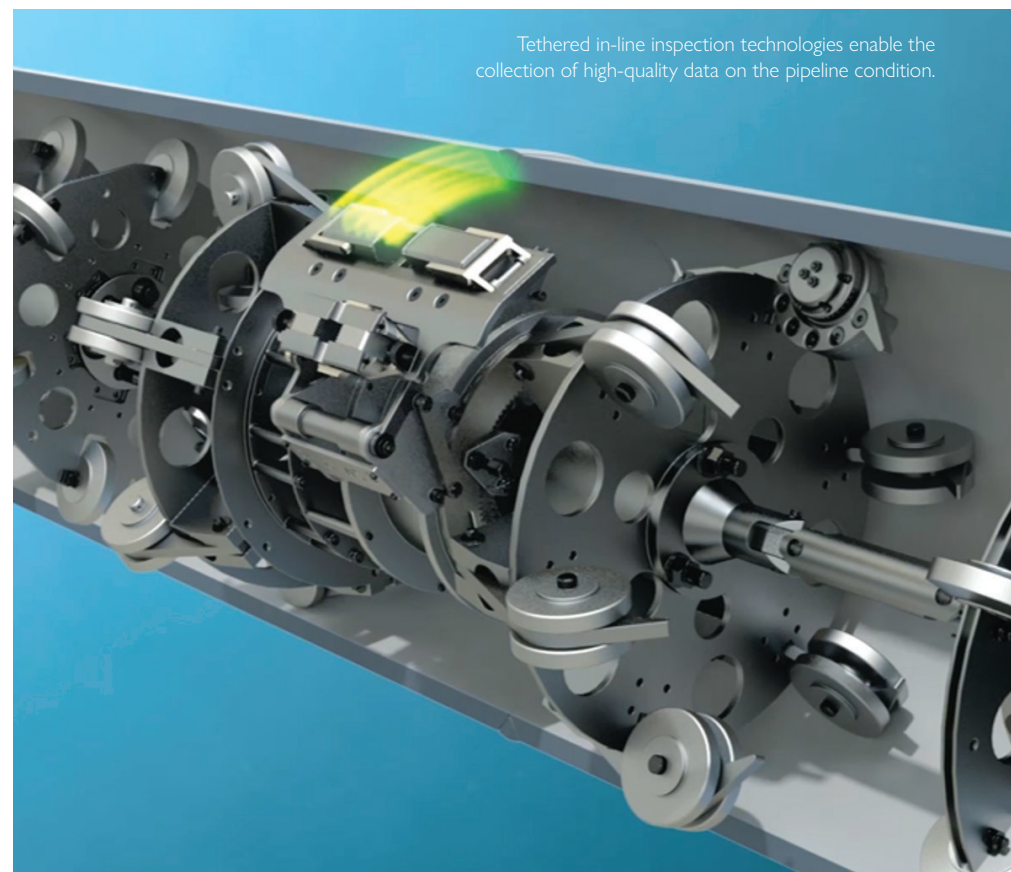
"By utilising tailored solutions equipped with proven technology, many of these valuable assets can be successfully inspected. Information obtained from tethered ILI's empowers operators to make informed decisions about the integrity

management of their asset," says Schneke.

The tethered in-line inspection technologies enable the collection of high-quality data on the pipeline condition due to the unique features such as:

- Crawler module that can be remotely controlled via tether in both forward and backward motion as well as speed adjustments.
- Precise high-resolution geometry, wall thickness and corrosion measurement with reliable ultrasonic technology (UT wall thickness and crack measurement).
- Time of flight diffraction (TUM-TOFD) measurement module scans girth welds for anomalies such as cracks and sizes them precisely.
- Live tether, which provides unlimited power supply and transmits real-time data back to the operator.

Schneke says a key feature in ROSEN's



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technology portfolio is the combination of different sensor technologies in order to get better picture.

"Combining different sensor technologies gives you a great advantage to form conclusive results. For example, UT shear wave technology is frequently used to detect internal and external cracks and provide length sizing of such. TOFD on the other hand gives you a precise depth sizing of cracks, supporting to form a better understanding of defects. This technology works by sending a wideband ultrasonic impulse in a "pitch and catch" arrangement and then measuring the difference in the diffraction signals returning from the crack-like features. By using this method, crack depth and location are quantitatively measured. TOFD technology, however, must be brought to a complete stop in order to perform a full 360-degree scan," he says.

Determination of whether a pipeline is Fit for Purpose (FFP) requires high quality information on the anomaly types present within the pipeline. The latest 2022 edition of AS 2885.3 reinforces the requirement for operators to understand and quantify the anomaly degradation rates that are occurring in a given pipeline, which in turn are used to determine

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inspection and FFP intervals, as well as asset remaining life. ROSEN has the toolbox of high resolution advanced inspection solutions to capture the necessary data to perform advanced engineering assessments, even in the most challenging of pipelines.

To ensure the accurate data collection through ROSEN's technology, the company puts the crawler through a performance test prior to mobilisation. This allows the equipment's calibration and functionality is equipped for any challenges that come its way. In terms of accuracy, each solution has an inspection specification, which is also tested and validated against AP1163 - a standard for ILI solutions.

As this type of technology becomes more available and approaches are more standardised, Schneke says operator are having a bigger sense of urgency and attention to preventing corrosion defects.

The ROSEN team has recently completed a

number of projects in Australia and Papua New Guinea where its self-propelled ILI solution has been deployed.

"In Papua New Guinea, we've done an inspection on a riser section that is attached to a platform, and the client was very interested in identifying corrosion near the splash zone, a high-risk area particularly susceptible to corrosion which is challenging to inspect through external means. We were able to safely inspect the integrity of the asset and provide a detailed report for the client to action a solution."

ROSEN Group not only provides inspection of assets, but its portfolio offers a variety of services from cleaning and gauging, MFL, Ultrasonic, EMAT and Eddy Current technology, visual inspection, and all aspects of the integrity management cycle, from hazard identification and risk assessment, through to repair plan generation and repair consultancy. **P**

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