

ROSEN Group

Cleaning, Inspection, and Combined Services for Safer and More Reliable Pipelines

Irrespective of the medium they transport, pipelines must be in good operating condition to work efficiently and cost-effectively.

Optimal operating conditions are achieved on the basis of two fundamental measures: pipeline cleaning and pipeline inspection. An expert in both areas, the ROSEN Group has supported the oil and gas industry with sophisticated inspections, integrity services, rehabilitations and products since 1980, thus ensuring that its customers' facilities maintain full operating capacity throughout their life span.

ROSEN pipeline cleaning tools are recognised as the most effective and efficient in the industry. Combining these tools with the skills and experience of its field personnel allows ROSEN to provide its customers with the best possible advice and service. All cleaning tools are designed to achieve optimal cleaning results in all possible circumstances and pipeline conditions including both standard and narrow bends. As part of the cleaning process, all tools remove any type of heavy debris, black powder, paraffin and scale deposits.

Apart from asset cleaning, ROSEN also boasts a comprehensive range of services and tools in the field of in-line inspection. The ROSEN Group offers geometry inspection, metal loss inspection, crack & coating disbondment detection, multi-diameter pipeline inspection, combined ILI technology, optical inspection, and leak detection. Finally, ROSEN provides a full range of Asset Integrity Management Services (AIMS) to maintain and extend the lifespan of pipelines and associated plants.

The ROSEN group developed the first electronic geometry tool in 1986. Since then, it has become the industry's tool of choice worldwide. Designed to check pipeline construction quality, locate undetected third-party damage and allow free passage for any other tool, ROSEN's Electronic Geometry Tools identify, measure and locate any possible obstructions in the pipe. To identify three-dimensional geographical pipeline co-ordinates on the basis of an inertial navigation unit as well as to monitor the inner geometry of the pipeline at the same time, ROSEN has, in addition, devised a reliable XYZ mapping system.

In the segment of metal loss inspection, ROSEN has developed the most sensitive tools available today. Based on Magnetic Flux Leakage (MFL) technology, these systems are designed to detect and accurately size pipe wall irregularities.

Pipeline deterioration by stress corrosion cracking (SCC) constitutes an increasing challenge for the pipeline industry which can only be overcome by means of reliable crack and coating disbondment detection. In response to this integrity threat, ROSEN has developed a new High-Resolution In-Line Inspection tool: RoCD² is a unique ultrasonic inspection tool based on a novel

concept of an Electro-Magnetic Acoustic Transducer (EMAT) that allows the detection of both coating disbondment (which increases pipeline susceptibility to corrosion) and stress corrosion cracking. The tool incorporates a high-resolution concept which is combined with the extremely robust mechanical design and operational performance shared by all ROSEN in-line inspection tools.

Multi-diameter pipelines, e.g. lines with internal diameters of say 18 / 24 or 28 / 42 inches, are normally classified as "un-piggable". Typically constructed before in-line inspection requirements were introduced and often featuring special fittings such as unbarred T's or heavy-wall 1.5 bends interfering with smooth inspection runs, such ageing pipeline systems are now nevertheless subject to mandatory integrity assessment. To ensure that the correct tool type and size is chosen for a given multi-diameter pipeline, ROSEN has devised an extremely efficient method for classifying such lines: the ROSEN MuDiCompass (ROSEN Multi-Diameter Complexity Assessment). Based on the three criteria of passage ratio, bend ratio and absolute pipeline size, this system makes it possible to overcome the specific difficulties associated with ILI inspections of multi-diameter pipelines.

A good example of combined ILI technologies is ROSEN's combined Magnetic Flux Leakage (MFL) / Ultrasonic Testing (UT) Corrosion Detection Tool RoCorr-UT. UT – unlike MFL – is ideal for detecting and accurately sizing large areas of uniformly corroded metal loss and laminations. Conversely, MFL – but not UT – can detect and provide details on small corrosion pits and internal defects covered by wax and other deposits. Combining the strengths of both inspection technologies, RoCorr-UT provides the most comprehensive and accurate detection and sizing results based on a single inspection run.

ROSEN's Optical Observation Device is a unique optical inspection system that integrates a high-quality camera with its own lighting support into a robust pipeline cleaning tool. It thus provides dramatic visualisation of the inside of pipelines, capturing and storing the information in an on-board recording unit for future reference.

Using special Flow-Type Leak Detection Tools, ROSEN also offers leak detection services. Leak Detection Tools are easy to use



and require little time to collect data. On-board electronics record the flow rate and direction in water pipelines before transmitting the information to a receiver-analyser on the surface.

In addition to cleaning and in-line inspection, ROSEN has developed a number of robotic inspection tools, i.e. battery-powered and hence self-propelled tools, thus providing unique and effective solutions for inspecting un-piggable pipelines.

Completing the group's wide range of tools and services, ROSEN also provides the comprehensive service package AIMS, which stands for Asset Integrity Management Support to help operators achieve compliance with legal and company policy requirements. Recognizing the complexity of the integrity management process which not only involves assets, procedures, data gathering and analysis, but also financial considerations and human interaction, AIMS consists of the three basic components ROSEN Analyze, ROSEN Consultancy, and ROSEN Engineering.

As part of ROSEN Analyze, design, operation, and inspection data etc. is interpreted allowing operators to develop in-depth future integrity management plans. The ROSEN Consultancy component ensures that operators benefit from ROSEN's long integrity management experience during all phases of an asset's lifetime and with all aspects of daily operations. Finally, ROSEN Engineering is the umbrella term used for all types of creative design and construction of engineering structures and processes to solve specific industry challenges.

Making complex Asset Integrity Management procedures considerably easier and more transparent, ROSEN's cleaning and inspection services and notably its AIMS program ultimately all contribute to make pipeline systems safer as well as more reliable and cost-effective. ■