PIGGING PRODUCTS & SERVICES ASSOCIATION

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Pigging Industry News

the newsletter of the Pigging Products & Services Association

THE PRESIDENT'S LETTER

By Neil Mackay, STATS Group, Australia

Hello All!

Since my last letter, PPSA has been busy representing our members and promoting the pigging industry around the world.

Back in April, PPSA exhibited at PTC in Berlin, a nice mid-year opportunity between our annual seminars to engage with our members, Operators and suppliers alike.

Beyond our traditional channels, we've also been working to raise awareness of pigging and pipeline integrity. Earlier this year, Mark Elliott, Diane Cordell and I took part in a World Pipelines Podcast discussing *Pigging Pipelines – What Operators Need to Know*. Catch up on the action at https://www.worldpipelines.com/podcasts/navigating-the-world-of-pipeline-pigging/

Adding to this industry outreach, our Past President, Neil McKnight, reflected on PPSA's 35-year journey and the important role the Association continues to play in connecting operators and vendors to improve pipeline safety across the industry in his *Inside Oil & Gas Magazine* article, *A Legacy of Support, 35 Years in the Making*.

Another important member resource is the 2026/2027 PPSA Directory, which I'm pleased to announce is now available. The directory remains one of the most valuable resources PPSA provides, helping operators quickly connect with the right products, services and expertise from across our global membership. Subscribe for your free copy at https://ppsa-online.com/subscriptions

Supporting the next generation of pipeline professionals remains a key focus for PPSA. This year we were proud to sponsor three Young Pipeline Professional events: the YPP-USA Symposium in Houston, USA, the YPPE Mini Conference in Nivelles, Belgium, and the Borneo Pipeline Conference (BPC) in Miri, Malaysia.

Representing PPSA at BPC, I had the pleasure of participating in the Fireside Chat discussions. While there, I spent time with the volunteers behind YPP Malaysia, whose passion and commitment have helped grow both the organisation and the conference from strength to strength. Remarkably, BPC is only in its second year, yet it is already establishing itself as a must visit event on the international pipeline calendar. YPP Malaysia's membership has also grown to more than 600 professionals in recent years, a testament to the energy and dedication of the team behind it. Culminating in a competitive golf tournament, the incentive to find the fairway has never been greater, with a course local crocodile eager for your next hook or slice to find the water's hazards edge.

Looking ahead, PPSA will again be exhibiting at the IPC Exposition in Calgary, drop by, pick up a hard copy of the directory and have a catch up with Diane.

Attention now turns to our main event, the relocated, growing and expanded **PPSA Conference, 17th-19th November in Amsterdam, The Netherlands.** In addition to technical paper presentations, exhibitions and networking opportunities, we're pleased to be offering two specialist training courses: *Managing Cracks and Seam Weld Anomalies* presented by Sergio Limon of Blade Energy Partners, and *An Introduction to Pigging* delivered by PPSA member companies. We will also be hosting a panel session focused on Industry Priorities and Technology Gaps, undoubtedly generating some valuable discussion. What makes the PPSA Conference unique is its pure focus on pigging products and services. If you haven't registered yet, please secure your place now at: https://ppsa-online.com/conference

But, in the meantime of course....

Keep on piggin', folks.

NEW Members

Full

ClampOn AS, Norway

FB Pigging Solutions, Australia

IK Saudi for Industries company, Saudi Arabia

Sentris S.r.l., Italy

Associate

UB-Power (an UN-TEC Company), The Netherlands

PT Inspeksi Pipa Indonesia, Indonesia

PT Radiant Utama Interinsco, TBK, Indonesia

Individual

Brian Kerrigan, UK

Improving data quality and operational efficiency in high-flow gas pipelines

A Practical Approach Using Dynamic Speed Control (DSC 2.0) with DfL-UHR Technology

Bryan Varnell, Enduro Pipeline Services

Executive Overview
Inline inspection remains one of the most critical components of pipeline integrity management, but the quality of any inspection is ultimately dependent on the operating conditions experienced during the run. Although advancements in sensor technology have significantly improved anomaly detection capabilities, gas pipeline conditions continue to introduce challenges that directly impact data quality. One of the most influential variables affecting inline inspection performance is tool velocity. In high-flow gas systems, maintaining a stable inspection speed can be difficult, and variations in tool speed directly affect the ability to detect, size, and characterize anomalies consistently.

The integration of Dynamic Speed Control (DSC 2.0) with Ultra High Resolution DfL (DfL-UHR) technology provides a practical solution to these challenges. By regulating tool velocity and improving flow conditions through the inspection assembly, operators can create a more controlled inspection environment capable of producing consistent, repeatable, and higher-quality data without introducing significant operational complexity.

The Reality of Inline Inspection in Gas Pipelines
Gas pipeline systems are inherently dynamic. Flow rates fluctuate, delivery demands change, and varying offtakes influence internal pipeline conditions throughout an inspection run. Unlike liquid systems, where flow conditions can often be controlled more directly, gas pipelines frequently expose inline inspection tools to changing velocities and unstable operating environments. These variations can create inconsistent inspection conditions that ultimately affect data collection quality and tool performance.

In many cases, inconsistencies in tool behavior are not immediately apparent during the inspection itself but instead become evident during data analysis or field validation activities. Variations between reported

Dynamic Speed Control 2.0

results and excavation findings are frequently traced back to unstable tool velocity, inconsistent sensor contact, or debris interference during the inspection. The challenge is not simply moving an inspection tool through the pipeline, but ensuring that the system operates under conditions that allow it to perform as designed.

The Impact of Tool Velocity on Data Quality
Tool velocity directly affects the performance of magnetic flux leakage (MFL) inspection technologies. As outlined within Enduro's performance specifications, the ability to detect small anomalies such as pinhole corrosion depends heavily on the amount of time a sensor is exposed to the feature. As inspection speed increases, the effective exposure window decreases, reducing the likelihood of capturing a complete and accurate signal response.

This relationship becomes especially important when evaluating small-volume or steep-sided anomalies that naturally produce weaker magnetic signatures. At elevated velocities, these features become more susceptible to under-sizing or mischaracterization. Even with increased sensor density and high-resolution inspection technology, the fundamental physics associated with signal acquisition remain unchanged. Excessive or inconsistent velocity ultima tely lea ds to inconsistent data quality, which directly impacts integrity decision-making, repair prioritization, and overall confidence in the inspection results.

Limitations of Traditional Inspection Approaches
One of the most common approaches to manage tool velocity involves reducing pipeline flow rates to bring inspection speeds within an acceptable operating range. While this can be effective, it is often difficult to implement in high-demand gas transmission systems where throughput requirements and delivery obligations limit the ability to significantly reduce flow.

Even when flow reductions are possible, maintaining a consistent inspection velocity throughout the run can still be challenging. Gas pipelines are dynamic systems, and variations in elevation, flow demand, compressor activity, and offtakes can all influence tool behavior.

In some situations, inspections are ultimately performed under less-than-ideal operating conditions with the expectation that post-processing or analysis techniques can compensate for velocity variability. Although usable data may still be obtained, inconsistent operating conditions can increase uncertainty within the inspection results and create additional challenges during validation, integrity assessment, and repair activities.

A Combined Approach: DSC 2.0 and DfL-UHR
The integration of DSC 2.0 with DfL-UHR technology represents amore direct and operationally efficient approach to managing inspection conditions in high-flow gas pipelines. DSC 2.0 is specifically designed to regulate tool velocity in challenging gas environments by reducing speed where necessary and maintaining a more stable inspection profile throughout the run. Depending on operating conditions, the system is capable of reducing tool velocity by approximately 50% to 70%.

At the same time, the DfL-UHR platform provides high-resolution axial MFL data through increased sensor density and advanced signal capabilities. With hundreds of sensors dedicated to metal loss detection and anomaly characterization, the system is designed to identify both generalized corrosion and smaller, more complex features. When integrated together, DSC 2.0 and DfL-UHR create a more controlled inspection environment that improves data consistency while reducing operational variability.

Gas Flow Dynamics, Bypass, and Debris Management
While velocity control remains a critical aspect of successful inline inspection, gas flow behavior through and around the inspection assembly also plays a major role in overall tool performance. In gas pipelines, debris can behave unpredictably due to fluctuating flow conditions. Even after cleaning operations, residual debris may remain suspended within the pipeline and intermittently cycle through

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the inspection assembly depending on localized pressure and velocity changes.

When debris repeatedly cycles through the inspection tool, it can introduce signal noise, distortions, and inconsistent sensor responses that negatively impact data quality. Rather than creating a highly restrictive tool train, DSC 2.0 maintains bypass flow across multiple sections of the inspection assembly, allowing gas to move more efficiently through and around the tool. This approach helps maintain a more stable differential pressure profile while reducing the tendency for the inspection assembly to behave as a significant restriction point within the pipeline.

The bypass-driven design also leverages the Venturi effect to influence localized gas flow behavior through the tool. As gas accelerates through bypass sections, localized changes in velocity and pressure generate a more energetic and turbulent flow ahead of the inspection assembly. In high-flow gas pipelines, this turbulence helps keep debris moving ahead of the tool rather than allowing material to settle, fall back, or repeatedly cycle through the inspection system. By promoting continuous debris movement and preserving flow efficiency, DSC 2.0 supports a cleaner sensor environment and contributes to more stable and reliable inspection data.

Technical Performance in Controlled Conditions
Inline inspection systems are designed to operate within defined performance parameters that include velocity, cleanliness, and tool stability. Enduro's specifications identify an optimal operating velocity range of approximately 3 to 6 mph for accurate data collection. Operating outside of this range can adversely affect both anomaly detection sensitivity and sizing accuracy.

By maintaining tool velocity within the intended operating parameters, DSC 2.0 helps ensure that the DfL-UHR system performs under conditions consistent with its validated design criteria. The platform also supports high-accuracy geometry measurements, including dent and ovality detection with sizing accuracy approaching ±0.5% of outside diameter on larger pipelines. These measurements rely heavily on stable tool positioning and consistent interaction with the pipe wall, both of which benefit directly from controlled velocity and improved gas flow behavior.

Operational Impact and Efficiency Gains
From an operational perspective, integrating velocity control and inline inspection into a single inspection system provides several practical advantages. By combining these functions into one deployment, operators can reduce the need for multiple tool runs, lowering both execution risk and overall project cost. This approach simplifies scheduling, reduces time spent occupying the pipeline, and minimizes operational disruption during inspection activities.

Additionally, because DSC 2.0 actively manages tool velocity internally, operators can often avoid significant flow reductions during the inspection process. This allows inspections to be completed while maintaining higher system throughput. The overall result is a more efficient inspection strategy with fewer operational variables and more predictable outcomes.

Alignment with Industry Standards and Integrity Programs
The DSC 2.0 and DfL-UHR platform is designed to align with established industry standards governing inline inspection performance and data quality. Metal loss detection and sizing capabilities are consistent with the requirements outlined in API 1163, including performance expectations for probability of detection, anomaly sizing accuracy, and reporting consistency.

For geometric inspections, dent and ovality measurement capabilities support the assessment methodologies described within API RP 1183 for strain-based integrity evaluations. A critical aspect of meeting these industry standards involves maintaining the operating conditions under which inspection system performance has been validated. By controlling velocity and improving gas flow behavior, DSC 2.0 helps maintain the inspection system within its intended performance envelope, supporting the collection of consistent and repeatable integrity data.

Conclusion
As gas transmission systems continue operating at higher flow rates, many of the challenges associated with inline inspection are increasingly tied to operating conditions rather than tool capability alone. High-resolution inspection technologies can only deliver accurate results when operating within conditions that support stable tool performance and reliable signal acquisition.

The combination of Dynamic Speed Control (DSC 2.0) and DfL-UHR technology directly addresses one of the most significant variables affecting inline inspection performance: tool velocity. At the same time, the system improves gas flow behavior and debris management around the inspection assembly, creating a more controlled and stable inspection environment. By improving operating consistency throughout the run, operators can increase data quality, reduce operational complexity, and make more confident integrity management decisions based on the inspection results.

References
American Petroleum Institute. (2013). API Standard 1163: In-line inspection systems qualification.
American Petroleum Institute. (2022). API Recommended Practice 1183: Assessment and management of dents in pipelines.

Dual diameter HD camera Pigging – 42in x 48in pipeline

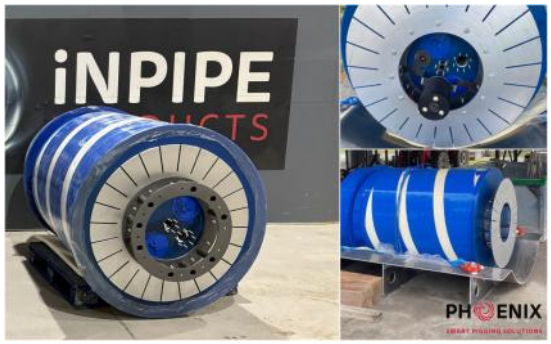
iNPIPE PRODUCTS™ was approached to carry out a gauging pig run on an ageing 42in pipeline system whose condition was completely unknown to the operator. Following a comprehensive design review, a foam pig was deemed the safest option to ensure minimal risk transit.

The pipeline was designed for sphere pigging and features an approximately 25m long launcher extending beyond the first topside bend, meaning conventional pig loading was not possible. The pig had to be inserted into the launcher by hand, adding further complication and ruling out the possibility of using a traditional dual diameter pig design.

Following client approval, the bespoke foam pig was manufactured at the company's North Yorkshire facility. The foam pig comprised both low and medium density foam structures, with front and rear sealing discs designed to seal inside the 48in launcher and ensure navigation of a 36in tee. A gauge plate was installed on the rear, together with a transmitter and data logger to provide key information about the pig run and the internal pipeline condition.

Following delivery, the client asked whether PHOENIX Vision HD camera technology could be incorporated into the pig, with a turnaround of less than one week and using a design that could be retrofitted to the existing equipment. The engineering team promptly designed a retrofit bracket to securely accommodate the camera and battery alongside the existing data logger and transmitter. Using the existing mounting points and requiring only profiling and bending, the design enabled subsequent local manufacture, with the bracket produced the following day.

iNPIPE PRODUCTS™ personnel then mobilised to site to install and set up the HD camera technology and prepare the pig for delivery to the platform. The camera was activated and the pig was loaded into the launcher using an iNPIPE PRODUCTS™ manual pig loader. The pig was launched shortly afterwards and successfully received, confirming that the pipeline could be pigged. This allowed the operator to develop a cleaning plan in preparation for a full inline inspection survey.



Managing the growing data challenge in crack detection

Advances in EMAT technology provide more insight into pipeline conditions than ever before. As inspection datasets continue to grow, machine learning is helping analysts evaluate information more efficiently, enabling faster and more consistent integrity assessments while keeping expert judgement at the center of decision-making.

Author: Stephan Eule, ROSEN Group

Crack detection: A discipline built on evidence
Inspection technologies have evolved significantly over the past decade, enabling operators to collect more information about pipeline condition than ever before. Yet crack detection remains one of the most challenging areas of pipeline integrity.

Stress corrosion cracking, fatigue cracking, and seam weld anomalies create complex inspection signatures that require more than advanced tools alone. Reliable assessment depends on a combination of technology, in-field verification, engineering judgement, and decades of accumulated expertise.

EMAT technology has become a leading crack-detection solution for gas pipelines. Recent generations of EMAT tools provide higher channel counts, denser sampling, and improved signal quality, delivering a much richer view of pipeline condition. These advances increase the likelihood of identifying smaller or more subtle indications, but they also generate significantly larger datasets that must be analyzed and interpreted.

Why EMAT analysis requires specialist expertise
Unlike some other inspection technologies, EMAT does not directly measure crack depth. Analysts must interpret guided-wave behavior by evaluating reflections, attenuation patterns, transmitted signals, and interactions across multiple channels.

Different conditions can produce similar responses. Crack colonies, corrosion, manufacturing features, surface roughness, and sensor liftoff may all affect the signal in comparable ways. Distinguishing between them depends on experience, context, and a deep understanding of both the technology and the pipeline being assessed.

Sizing adds another level of complexity. While identifying a crack indication is challenging, estimating its actual depth requires even greater confidence and precision. Structured qualification processes and review procedures help ensure reliable and auditable results, but interpretation remains a task that relies heavily on expert judgement.

More data, more decisions
Improved sensor performance is a major benefit for operators. Higher-resolution data provides stronger diagnostic evidence and earlier insight into developing threats.

At the same time, richer datasets create new challenges. More signals per kilometer lead to a higher number of candidate indications to review and consequently more decisions for analysts to make. Experienced EMAT analysts remain one of the most valuable resources in the crack detection process. Building this expertise takes years, so using analyst time efficiently becomes increasingly important as data volumes grow.

Where machine learning creates value
Machine learning models, and in particular deep learning models trained on ILI signal data, are helping analysts manage this growing analytical workload more efficiently.

Rather than replacing analysts, machine-learning models can prioritize signals that require detailed review, filter benign routine cases, and support more consistent screening across large datasets. This reduces the time spent evaluating inspection data while helping analysts focus their expertise on the indications that matter most.

Several AI model applications are particularly valuable. Triage models can rank candidate indications based on their likelihood of being injurious crack-like features. Classification models can help identify non-injurious signals associated with coating disbondment, manufacturing features, or geometric effects. Machine learning can also support consistency by highlighting cases that deserve additional review and providing supplementary information for crack sizing decisions.

In all cases, the analyst retains full responsibility for the final assessment; machine learning supports the decision-making process but does not replace expert judgement.

Models depend on trusted data
The quality of a machine-learning model depends on the quality of the data behind it. For crack detection, verified field outcomes provide the most valuable foundation. Excavation findings, in-ditch inspections, laboratory investigations, and recovered pipe samples establish the relationship between inspection signals and actual feature characteristics.

The most effective models connect three elements: the original inspection signal, the analyst interpretation, and the verified field outcome. This traceability is essential for achieving reliable and defensible performance.

Trust also requires strong governance. Models must be validated using industry-relevant performance metrics, continuously monitored, and supported by transparent version control and quality processes. In a safety-critical environment, confidence depends on more than accuracy alone. It depends on evidence, traceability, and accountability.

Looking ahead
One of the most promising developments is the ability to evaluate information from multiple inspection technologies together. Combining EMAT, MFL, geometry data, and historical inspection records can reveal relationships and patterns that are difficult to assess manually across an entire pipeline system.

As inspection technologies continue to evolve, the industry challenge is no longer collecting more information. It is transforming increasingly large and complex datasets into actionable integrity insights efficiently and reliably.

The future of crack detection will be shaped by four connected advances: better sensors, trusted data, effective machine-learning tools, and highly skilled analysts. Together, these capabilities will help operators make faster, more consistent, and more confident integrity decisions while ensuring that human expertise remains at the center of the process.

Seven consecutive RoSPA Gold Awards for iNPIPE PRODUCTS™

iNPIPE PRODUCTS™ has achieved its seventh consecutive RoSPA Gold Award for health and safety performance, earning the RoSPA Gold Medal Award for 2026. The award recognises the sustained approach to health, safety and wellbeing maintained across the company's operations and the contribution made by employees throughout the business.

Simon Bell, Managing Director of iNPIPE PRODUCTS™, said: "Receiving our seventh consecutive RoSPA Gold Award, and our ninth consecutive RoSPA Award overall, is a significant achievement for the business. It is testament to the consistent approach taken across our operations and to the contribution of everyone across the company."

The achievement coincides with the 70th anniversary of the RoSPA Awards. The 2026 programme attracted approximately 2,000 entries from organisations in nearly 60 countries, highlighting the international standing of the awards. As one of the UK's largest and most established health and safety programmes, the RoSPA Awards recognise organisations committed to continually improving workplace health and safety.

PIGGING PRODUCTS & SERVICES ASSOCIATION

Pipeline Pigging Conference, Amsterdam

REGISTER NOW
to reserve your place

17–19th November 2026
Amsterdam, Netherlands

Panel session:
Industry priorities and technology gaps – a multi-stakeholder conversation

You will gain a cross-industry perspective on making Pipelines Future Ready.

Join the conversation about the technologies that will shape the future of pipeline integrity, focusing on the application of AI, Big Data, Emerging Fuels and Advances in Crack Detection while highlighting the critical gaps that require collaborative action.

The purpose of the panel is to identify where innovation is still needed to support safe, reliable, and efficient pipeline operations.

The session will be particularly useful for Research and Development Engineers, Marketing and Decision Makers.

The panel will consist of leading industry experts representing Pipeline Operators, Regulators, Research Associations, Advisors and Pigging vendors.

Attend free of charge when booked with a conference delegate place

Tuesday 17th November
in the afternoon

Course on Managing Cracks and Seam Weld Anomalies in Energy Pipelines

Presented by Sergio Limon, Blade Energy Partners

Tuesday 17th November
9am to 5pm

Course on Introduction to Pigging

Presented by PPSA Members for young pipeliners, students and people new to the pigging industry

Tuesday 17th November
9am to 12.30pm

Technical Paper Presentations and Exhibition

Presentations include the following subjects:

Cleaning pipelines for ILI inspection; Solutions for inspecting challenging pipelines; Managing wax induced corrosion; Development of bidirectional UT in-line inspection for challenging pipelines; Robotic MFL crawler inspection of jet fuel line; Machine Learning to optimise and analyse multiple ILI data sets; Tool development for Stress Corrosion Crack detection in pipelines; ILI technology qualification using full scale loop testing

Registration at: www.ppsa.online.com/conference
Contact: Diane Cordell, PPSA Executive Secretary for details
E: ppsa@ppsa-online.com

Multi-threat capability. Single-run efficiency. Rethinking pipeline integrity with multi-technology inspection—NDT Global

From single-threat inspection to multi-technology intelligence

Inline inspection has evolved considerably since the first intelligent pigs were introduced in the early 1970s. Early inspection tools were largely developed around individual integrity threats, with different technologies designed to address specific inspection requirements. MFL systems focused on metal loss, caliper tools on dents and pipeline geometry, while IMU systems provided information about pipeline position and movement.

As pipeline integrity requirements became more demanding, this single-purpose approach created an operational challenge. A comprehensive assessment could require multiple inspection runs, increasing cost, downtime, and the risk of having to repeat an inspection if the pipeline condition differed from expectations. The industry therefore began moving toward multi-mission systems that could combine complementary technologies within a single inspection.

That evolution was not simply about putting more technologies on the same tool. Increasing sensor density, sampling frequency, and data resolution enabled inspection systems to capture more information during each run, while advances in analysis allowed different datasets to be considered together. The objective shifted from simply detecting individual anomalies to providing a broader understanding of pipeline condition.

Quadra™ represents the next step in that evolution. Built on the proven Trinity™ UHR ILI platform, it brings four complementary inspection technologies together in a single system, combining UHR Axial MFL, UHR Circumferential MFL, Caliper, and Low-Field technology. The result is a multi-technology inspection approach designed to provide multiple perspectives on pipeline condition in a single run.

Moving beyond a single-threat approach
As pipeline networks age and integrity threats become increasingly complex, operators need to extract greater value from every inspection opportunity. Corrosion, seam-related anomalies, narrow linear indications, deformation and material variations can coexist within the same asset, creating challenges that may be difficult to fully characterize using a single inspection technology.

At the same time, inspection programmes must balance technical requirements with operational constraints, cost and disruption. The challenge is therefore not simply to detect anomalies, but to gather the insight needed to understand their significance and make confident integrity decisions.

Different technologies provide different insights. MFL can identify and characterize metal loss, caliper technology assesses pipeline geometry, and material-sensitive technologies provide information about the pipeline itself. The challenge arises when these conditions overlap.

By combining complementary technologies within one inspection system, operators gain multiple perspectives on the same feature. The objective is not simply to collect more data, but to generate the context needed to interpret it.

Four technologies. One inspection system
Built on the proven Trinity™ UHR ILI platform, Quadra™ combines four complementary technologies into a single inline inspection system, delivering multiple perspectives on pipeline condition during a single inspection. Its UHR Axial MFL capability provides high-resolution assessment of metal loss features, including pinholes, pits-in-pits, gouges, and complex corrosion.

Circumferential UHR MFL adds a complementary magnetic field orientation that enhances the assessment of narrow axial features, seam-related anomalies, and long-seam profiles. This additional perspective can be valuable in complex inspection environments.

Caliper technology provides detailed information about pipeline geometry, including dents and ovality, while Low-Field technology delivers insight into material characteristics, such as pipe grade, permeability changes, and hard spots. Together, these technologies create a more comprehensive picture of the pipeline condition, bringing information about defects, geometry, and material characteristics together.

Why inspection orientation matters
One important factor when assessing complex features is the orientation of the inspection technology relative to the anomaly. Axial MFL provides a well-established method for detecting and characterizing metal loss. However, some features benefit from inspections using an additional magnetic field orientation.

By combining axial and circumferential MFL, Quadra provides two complementary inspections. This supports the assessment of features that may be

challenging to characterize using a single magnetic field orientation, particularly narrow linear indications and seam-related features.

The value of the additional orientation is not simply the generation of another dataset. It provides additional information that helps analysts better understand feature characteristics and distinguish between different anomaly types. For integrity engineers, this additional context can be invaluable when determining if a feature requires further assessment, monitoring, or intervention.

From detection to characterization
The pipeline integrity industry has made significant advances in anomaly detection and sizing. Yet, detection is only one stage of the integrity management process.

Once an anomaly is identified, operators must determine how significant it may be and whether it interacts with other features. This distinction between detection and characterization becomes important in complex threat environments.

A single indication rarely tells the entire story. Geometry and nearby anomalies can all influence the overall assessment of pipeline conditions. By combining complementary inspection technologies, Quadra is designed to provide integrity teams with additional contextual information, supporting more informed interpretation of inspection findings and helping engineers determine where further analysis may be appropriate.

An optional IMU/XYZ mapping capability can also provide location, orientation, movement, and displacement information to support anomaly location and geohazard assessment. Together, these capabilities can help move the conversation from simply asking ‘what was detected’ to asking ‘What does this mean for the asset.

Supporting integrity decision-making
The value of inspection technology ultimately lies in the decisions it enables.

Operators need to prioritize findings, determine where engineering assessment is required, and develop effective mitigation or remediation strategies. The quality and context of the inspection data can significantly influence each of these decisions.

A multi-technology inspection approach provides the context needed to address some of the most important integrity management questions. It can help operators determine which findings warrant further investigation, establish priorities for assessment and remediation, understand whether separate indications may be interacting, and evaluate how geometry or material characteristics could influence interpretation. This broader perspective supports more informed engineering assessments and helps ensure inspection, monitoring and remediation strategies are directed where they can deliver the greatest value.

By bringing complementary inspection data together within a single inspection framework, Quadra is designed to support a more informed and efficient decision-making process. This does not replace engineering judgement. Rather, it provides broader evidence based on which that judgement can be applied with greater confidence.

Efficiency matters too
Technical capability is only one consideration when planning an inspection program. Operators must also consider how efficiently an inspection can be deployed within the operational constraints of an asset.

Every inspection campaign requires planning, preparation, and coordination. Conducting separate inspections for different threats can increase cost, operational complexity, and disruption.

Quadra's integrated configuration is designed to maximize the value of a single inspection opportunity. It is engineered as the shortest, lightest, and most collapsible configuration in its class and has the highest first run success in the industry.

Where multiple integrity threats need to be assessed, integrating complementary technologies can reduce the need for additional inspection campaigns, depending on the pipeline, threat profile, and inspection objectives.

This creates a different way of thinking about inspection efficiency. Efficiency is not necessarily about reducing the amount of inspection data collected. It is about increasing the value that can be obtained from each inspection opportunity.

Rethinking the inspection question
The evolution of inline inspection has traditionally focused on improving detection, sizing, and classification. Increasingly, attention shifts towards how operators use information generated.

That means looking beyond individual anomalies and considering the wider integrity of pictures. Quadra reflects this shift by combining UHR CMFL, UHR AMFL, Caliper, and Low-Field technology within a single inspection system. Each technology contributes to a different perspective, while the combined dataset provides additional context for understanding pipeline conditions. For operators, this changes the question from: "Which technology should we use?" to "What information do we need to make the best integrity decision?"

That distinction matters.

A multi-technology approach does not mean inspecting more simply for the sake of generating additional data. It is about combining complementary capabilities to provide a more complete understanding of the assets.

For integrity teams, the benefits are clear: greater content, greater confidence in feature characterization, and a stronger foundation for prioritizing inspection findings and integrity actions.

As pipeline integrity management continues to evolve, the ability to gather multiple perspectives in a single inspection may become increasingly important. Because the most valuable inspection is not necessarily the one that identifies the most anomalies, it is the one that provides the information needed to understand those anomalies and make the right integrity decisions.

Introducing new PPSA member IK Saudi for Industries Company

IK Saudi for Industries Company specializes in the design and manufacture of high-performance pigging products and solutions that support efficient and reliable pipeline operations across diverse industries. Their in-house engineering capabilities enable them to deliver everything from standard pigging technologies to fully customized systems developed for unique process and operational requirements. By integrating technical innovation, precision engineering, and industry-proven expertise, they help operators reduce downtime, maintain pipeline integrity, and achieve sustainable operational excellence.

Transforming hydrogen pipeline inspections with Velonix®

Objectives and background

- Performing smart tool integrity pigging in hydrogen service pipelines is extremely challenging, as hydrogen is far more compressible than natural gas or nitrogen and can create significantly larger, less predictable pig speed excursions
- The primary issue was the inability to reliably complete ILI runs in hydrogen service, with excessive speed excursions creating risk to tool integrity, inspection data quality, and overall run success
- Previous attempts to complete these runs without Velonix® control were unsuccessful due to the inability to effectively manage speed fluctuations and maintain tool velocity within acceptable limits
- Expro had previously deployed the Velonix® system on an earlier project, successfully demonstrating its ability to control pig speed in challenging conditions and giving the client confidence in the technology

Expro Excellence

- Expro deployed Velonix® to actively manage and stabilize pig velocity during hydrogen ILI operations
- The system reduced and controlled flow velocity in real time, continuously monitoring conditions and responding instantly to developing speed excursions to suppress or eliminate them before they could escalate
- Unlike traditional approaches that rely on passive flow control, Expro provided active, real-time velocity control. Velonix® continuously adjusted flow conditions based on live feedback, allowing precise management of pig speed in a service environment where conventional methods had already proven ineffective
- The team successfully tested and confirmed that the non-intrusive pipeline velocity measurement system could operate reliably in hydrogen service-something not previously proven
- The digital flow skid, valves, materials, and sealing systems were reconfigured to meet hydrogen compatibility requirements. The team overcame the inherent instability caused by hydrogen's high compressibility, enabling consistent velocity control where prior efforts had failed
- In a previous attempt without Velonix®, an uncontrolled speed excursion destroyed the multi-million-dollar ILI tool, resulting in a complete loss of inspection data

Value to the client

- Expro enabled the safe and successful completion of multiple ILI runs in hydrogen service-something the customer had previously been unable to achieve
- This delivered high-quality integrity data while eliminating the significant safety and financial risks associated with uncontrolled speed excursions
- Multiple successful runs in a service environment where prior attempts had failed
- Significantly improved data quality through stable tool velocity
- Real-time, automated control, enabling immediate response to changing conditions
- Live data visibility via Expro's Data-to-Desk platform, allowing stakeholders to monitor operations and make faster, informed decisions
- Expro transformed an operation that was previously high-risk and unreliable into a controlled, repeatable process
- By stabilizing pig speed and eliminating uncontrolled speed excursions, we protected critical inspection assets, ensured data integrity, and gave the customer confidence to validate pipeline mechanical integrity in hydrogen service, safely and efficiently

3X Engineering Subsea composite repair solution for pipe reinforcement

Overview

The goal of the repair, carried out in February 2026 by **3X ENGINEERING (3X)** specialists was to strengthen a 12" riser affected by external corrosion defects: four through-wall defects and six metal loss areas. To restore the riser's structural integrity, REINFORCEKiT® 4D SUBSEA was selected. This composite repair solution, designed for subsea application, was installed in two phases.

Scope of work

In accordance with ASME PCC-2 standard and 3X design calculations, REINFORCEKiT® 4D SUBSEA system, using a dedicated subsea resin, was selected as composite repair solution. The repair was performed in shallow water at a depth of 20 meters. Surface preparation was performed by sandblasting to achieve the required surface profile and ensure optimal adhesion between the riser and the composite repair system. The average roughness measured was 77 microns, far above the 60 microns required.

The composite wrapping repair was executed in four main stages, as detailed below:

1/ Primer Application. A dedicated subsea primer was applied to the prepared surface to ensure uniform coverage of the defective area.

2/ Plates installation with filler.
Pre-manufactured metallic plates, sized to cover each defect, were coated with subsea filler and installed over the defective areas. The plates were secured using ratchet belts and maintained in position until full curing was achieved.

3/ Composite wrapping (Kevlar® tape + 3X subsea resin). The composite wrapping was carried out in two phases depending on the defect type.
Phase 1 - Through-wall defects ==> A total of 44 layers were applied over a 1200mm repair length to cover the four through-wall defects.
Phase 2 - Metal loss defects ==> This phase was divided into three wrapping sections to facilitate diving operations while maintening high application quality.
Wrapping 1 (localized above Phase 1 wrapping) covered 2 defects with 10 layers applied over a 780mm repair length.
Wrapping 2 (localized under Phase 1 wrapping) covered 1 defect with 10 layers applied over a 940mm repair length.
Wrapping 3 (localized under Phase 2 - wrapping 2) covered 3 defects with 10 layers applied over a 940mm repair length.

4/ Finalisation and validation. Identification plate was installed to ensure full traceability of the repair. Hardness testing was also performed to confirm complete curing of the composite system.

Results

This subsea repair successfully restored the structural integrity of the 12" riser despite significant through-wall and metal loss defects. Completed in shallow water under demanding conditions, the intervention met all quality requirements. The solution is designed to deliver a durable performance with an expected service life of 20 years.

Pipeline cleaning and intelligent Pigging in Nigeria's oil & gas sector

An Overview of Operational Realities, Technical Methodologies, and the Local Regulatory Framework

Author Mr. Tunde Ajala, Founding Executive Director, Dovewell Oilfield Services

The oil and gas sector remains the bedrock of Nigeria's economy. Thousands of kilometers of pipeline networks span across the treacherous terrain of the Niger Delta region to offshore platforms, serving as the literal lifelines for crude oil and natural gas transportation. However, keeping these networks functional, efficient, and secure poses a massive logistical challenge. Aging infrastructure, internal corrosion, wax deposition, and the constant threat of external interference make pipeline integrity a matter of national economic and environmental survival.
To combat these threats, midstream and upstream operators increasingly rely on two critical maintenance workflows: industrial pipeline cleaning and Intelligent Pigging (In-Line Inspection or ILI).

The operational challenge: Why Nigerian pipelines clog and corrode
Operating pipelines in Nigeria presents distinct challenges compared to other oil-producing regions. First, much of the onshore infrastructure is decades old, rendering it highly susceptible to metal loss and fatigue. Second, Nigerian crude—such as the famous Bonny Light—is sweet but can exhibit high paraffinic wax content depending on the field. Over time, temperature drops cause this wax to precipitate, sticking to the internal walls of the pipe, reducing the internal diameter, and choking flow rates.

Worse still, stagnant water traps and bacterial growth inside pipelines promote localized internal corrosion (pitting). Without regular remediation, these factors lead to catastrophic failures, costly emergency shutdowns, and devastating environmental pollution across delicate ecosystems.

Step 1: Progressive Pipeline Cleaning
Before an operator can inspect what is happening inside a pipeline, the line must be systematically cleaned. In Nigeria, this process often employs "progressive pigging." Operators insert mechanical utility pigs into a specialized pig launcher. These devices are propelled through the pipeline by the pressure of the product itself or an external medium like compressed air or nitrogen.

- Polyurethane Foam Pigs: Used initially to prove the line, wipe out loose liquid, and assess the level of debris.
- Scraper and Brush Pigs: Equipped with steel brushes or polyurethane blades to aggressively scrape off stubborn wax, hard scale, and chemical deposits.
- Gel Pigging: In complex lines where mechanical pigs risk getting stuck due to bore reductions or tight bends, operators deploy high-viscosity chemical gel pigs. These conform to changing pipe geometries and trap debris effectively.

Step 2: Intelligent Pigging (In-Line Inspection)
Once the pipeline is clean and free of obstructions, operators deploy an Intelligent Pig (also known as a "smart pig"). Unlike utility pigs, intelligent pigs are highly complex diagnostic robots packed with sensors, data loggers, and onboard power supplies. As the smart pig travels down the line, it scans the pipe walls using three primary technologies:

1. Magnetic Flux Leakage (MFL): This tool saturates the pipe wall with a magnetic field. Where there is internal or external metal loss (from corrosion or gouges), the magnetic field "leaks." Sensors map these leaks to diagnose exactly how much wall thickness remains.
2. Ultrasonic Testing (UT): UT pigs emit high-frequency sound waves to directly measure pipeline wall thickness and pinpoint cracks or lamination defects with extreme accuracy.
3. Caliper/Geometry Sensors: These utilize mechanical arms or sensors to map the internal geometry, identifying structural dents, ovalities, or buckles caused by soil movement or illegal hot-tapping attempts.

The Nigerian Regulatory and Business Ecosystem
Pipeline integrity management in Nigeria is heavily guided by strict mandates from regulatory bodies such as the Nigerian Upstream Petroleum Regulatory Commission (NUPRC) and the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA). These agencies mandate periodic ILI campaigns to guarantee safety and environmental compliance.

Historically, intelligent pigging was dominated by foreign oilfield service giants. However, the Nigerian Oil and Gas Industry Content Development (NOGICD) Act has fundamentally shifted the landscape. Indigenous engineering firms have built substantial local capacity. These companies now deploy cutting-edge smart pigging solutions, utilize advanced data-logging equipment, and provide certified local personnel to execute deep-water and onshore campaigns.

The Value Proposition
While an intelligent pigging operation can cost several hundred thousand dollars, the return on investment is undeniable. Proactive maintenance allows Nigerian operators to transition from reactive emergency firefighting to predictive asset management. By accurately identifying defects early, companies significantly reduce downtime, maximize throughput, maintain regulatory compliance, and

prevent the environmental catastrophes that have historically plagued the Niger Delta region.

Dovewell Oilfield Services Limited is actively addressing modern operational, infrastructure, and technical bottlenecks that hinder intelligent pigging and inline inspections (ILI) within the Nigerian oil and gas industry. Long turnaround times, aggressive internal deposits, complex pipeline geometries, and lack of localized technical services have traditionally driven up asset integrity costs for Nigerian operators.

By combining proprietary local field engineering with advanced diagnostic technologies, Dovewell provides a comprehensive, localized value proposition to mitigate these challenges.

1. Combating Pipeline Deposits: Advanced Pre-Inspection Cleaning

Intelligent pigs require highly pristine pipeline internal surfaces to collect accurate data. Heavy paraffinic wax deposition and hard scale—typical of Nigerian sweet crudes frequent blind sensors, cause velocity excursions, or jam smart pigs inside the line.

- The Solution: Dovewell addresses this through specialized engineering workflows, deploying robust chemical and mechanical pipeline flushing and cleaning protocols. Their tactical handling was highlighted when they were awarded for operational excellence after executing a prompt emergency flush of a 20" TEP Pipeline for Renaissance Africa Energy Ltd. Their approach uses optimized utility runs alongside remote pumping solutions to ensure the bore is entirely ready for advanced electronic scanning.

2. Solving Data Delays & Sensor Accuracy
Historically, operators had to wait months for foreign data analysts to parse ILI information, stalling critical repair decisions while defects expanded. Additionally, precise Mapping of pitting and micro-cracking was difficult due to equipment wear.

- The Solution: Dovewell deploys highly advanced, multi-sensor inline inspection tools equipped for corrosion detection, metal loss, structural pitting, weld anomalies, and hydrogen-induced cracking (HIC). Their pipeline solutions team utilizes integrated data capture methods to record exact geometry anomalies (dents, bends, or buckles) alongside high-resolution wall thickness mapping. This minimizes structural data uncertainty and allows domestic operators to execute targeted repairs immediately under strict SGSI guidelines.

3. Mitigating the Domestic Skill Shortage
A prominent bottleneck in the Nigerian midstream sector is the heavy reliance on expatriate field specialists to manage smart pig runs and analyze diagnostic logs.

- The Solution: Operating out of their strategic facilities, Dovewell overcomes this barrier by heavily investing in local capacity building. They maintain a fully dedicated, homegrown Pipeline Solutions Team comprised of certified local personnel. Their operational structure ensures that senior field specialists provide on-the-job training and mentorship to site crews, expanding the domestic pipeline engineering pool in full alignment with the Nigerian Local Content (NOGICD) Act.

4. Bridging Pipeline Infrastructure Gaps
Many active flowlines and historical pipeline segments in the Niger Delta lack permanent mechanical launchers, receivers, or proper valve architecture, making them traditionally deemed "unpiggable".

- The Solution: Dovewell integrates full-lifecycle pipeline support including temporary pumping services, de-oiling, and specialized valve maintenance. To directly solve the challenge of long lead times for specialized flow-control infrastructure, Dovewell entered into agreements with global manufacturers like Perar Valve to build a premier valve assembling yard in Port Harcourt. This provides faster local access to customs and standard isolation components necessary to execute secure pigging campaigns.

Dovewell Regional Service Hubs
Operators looking to engage localized inline inspection or custom pigging operations can contact Dovewell through their primary Nigerian corporate nodes:

- Dovewell Oilfield Services Limited - Port Harcourt Office: Serves as the core logistical nerve center and primary supplier liaison node for field engineering and offshore deployments.
  - Location: Plot 182, Chief Nwuke Street, Off Ordinance Road, Trans Amadi Industrial Layout., Port Harcourt, Rivers State
  - Primary Focus: Pipeline Solutions Team deployment, pre-inspection cleaning machinery, and regional maintenance operations.
- Dovewell Oilfield Services Lagos: Handles main commercial administration, regulatory compliance liaisons with NMDPRA/NUPRC, and OEM partnership contracts.

STATS Group strengthens North American capability with senior appointment and major US expansion

Pipeline technology specialist **STATS Group (STATS)** has reinforced its commitment to the North American market with the appointment of experienced pipeline integrity professional Sebastiaan Schuite as US Sales Manager. Based in Houston, Schuite joins STATS as the company continues to expand its presence across the United States with the recent opening of a new 80,000 sq ft manufacturing facility in Rosenberg, Texas, and the doubling in size of its Houston service facility.

STATS are market leaders in the supply of pressurised pipeline isolation, hot tapping and line stopping services, enabling safe and efficient maintenance and repair of onshore, topsides and subsea pipeline infrastructure.

The appointment will support STATS' continued expansion across the North American market, with a focus on strengthening existing client relationships and identifying opportunities across previously untapped regions of the US pipeline market - including the Northeast, Northwest and Rocky Mountain states - while consolidating its established presence across the Lower 48. Schuite brings extensive industry experience to the role, having worked on both the operator and service company side of the sector, including seven years with pipeline inspection and integrity specialist Rosen Group and five years working across the North American and Mexican markets.

COPEX and PODS summit co-located with ptc 2027 in Berlin

The **22nd Pipeline Technology Conference (ptc)** will expand its role as a meeting place for the international pipeline community by hosting two co-located industry events for the first time. Taking place from 26 to 29 April 2027 at the Estrel Congress Center in Berlin, Germany, ptc will welcome both Concawe's COPEX seminar for European oil pipeline operators and the PODS Global Summit Berlin on Monday, 26 April, alongside the established ptc training courses.

COPEX brings together operators of Europe's cross-country oil pipeline network, whose incident data has contributed to Concawe's oil pipeline performance and spillage statistics since 1971. The PODS Association maintains the industry-standard open data model used by pipeline operators worldwide to manage asset, inspection and integrity information.

IK Trax develops new tri sensor Pig signaller

What's better than one verification method? Three verification methods! That's why **IK Trax** has developed their new magnetic, acoustic and electromagnetic pig detection signaller; TriSig™.

IK Trax, a leading designer and manufacturer of pipeline pig locating and signalling equipment and advanced pipeline data logging and testing systems, has developed the signaller based on global market demand and following customer feedback.

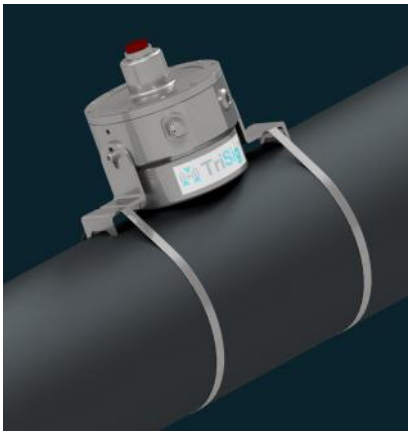
TriSig™ is an ATEX and IECEx compliant, non-intrusive, PSU powered pig signaller which quickly and accurately detects, signals and logs the passage of pigs at critical points along a pipeline both onshore and offshore.

The three detection methods removes any uncertainty over confirmation of pig passage as acoustic sensors monitor the vibrational and acoustic noise produced as a pig moves through a pipeline while magnetic sensors detect changes in the magnetic field generated as a pig fitted with magnets moves through a pipeline. In addition, magnetic sensors can detect electromagnetic signals emitted by a transmitting pig as it passes through a pipeline.

The events are then signalled as they occur via a number of communication methods including a high brightness LED positioned on top of the signaller, Bluetooth and RS485 Modbus RTU bi-directional communication.

The unit logs the time and date of up to 99 events and these logged events can be viewed remotely over several optional interfaces.

Compatible with all pipeline mediums, TriSig™ is suitable for all pig types and dedicated software enables real-time monitoring and instant readings via Bluetooth connectivity to your phone, tablet or PC, making debugging and testing more efficient while providing a deeper under-standing of the theory of operation.



IK Trax's TriSig pig signaller

Valvetight's self-developed DBB-SAVER technology

Valvetight is a company supplying its self-developed DBB-SAVER technology which makes working behind (otherwise) passing valves safe by mitigating any leakage. Zero leak rate enables the execution of activities on isolated equipment without shutting down the plant, platform or pipeline to increase boundary isolation.

The technology is based on creating, maintaining, controlling and monitoring of a vacuum-lock in the bleed section between either two valves (in a classical DB&B configuration) or in the body cavity of a single valve (e.g. a ball or gate valve). The vacuum-lock will make passing physically impossible!

The advantages are:
- Zero leak rate towards safe work area
- Online isolation integrity monitoring (the presence of the vacuum-lock) + alarms
- Online monitoring of the valve leak rate and any changes + pre-alarm
- Online registration of any GHG emission reporting obligations of processed gas
- Preventing plant shutdowns by preventing boundary isolation increase requirement
- Preventing GHG emissions by preventing boundary isolation increase requirement

The DBB-SAVER vacuum control unit is hooked up to the point(s) during the period the isolation needs to be in place (how it works: https://my.valvetight.com/video). It can be used to systems:

- of any line size diameter
- of any pressure rating
- with multiple bleed points simultaneously, even with mixed diameters and pressure classes
- containing gaseous (wet or dry) media, liquids, liquified gasses or multiphase media

Valvetight was founded in 2014 in the Netherlands by Jeroen Pronk, an former Asset Manager himself in the Oil & Gas industry, developing the technology. First commercial operations commenced in 2016 and in 2019 Valvetight opened their offices in the UAE. For equipment deliveries and operational services Valvetight can be contacted directly or via their agents in various regions.

To date they can look back on their operational history of:
- > 1000 Deployments
- > 1 Billion USD in prevented plant shut downs
- > 4 Million tons prevented CO2 equivalent GHG emissions
- Zero accidents
- 100% success rate in all projects executed with previously known leak rate
- > 98% success rate in all projects executed with no previously known leak rate

Show case
A typical application of the DBB-SAVER is to assist when pig trap valves are passing. It is very dangerous to expose personnel when pig trapdoors are unsafely opened for pigging operations. The DBB-SAVER however, makes it possible in such case to safely continue operations without losing precious time on-site.

For example, an offshore pig trap isolation support job in the North Sea. Here the DDB-SAVER was installed on 3 bleed connection points in the system of the CPP to Barrow-on-Furness South pipeline export trap and enabled a truly zero passing condition and thereby creating a safe working environment for the team to load the pig. The vacuum was kept on a continuous low level to prevent air ingress potential through the inner valve and keep the mixture in the bleed section well above UEL (non-flammable) while maintaining vacuum.

Valvetight DBB-SAVER

Deployment of the Valvetight DBB-SAVER achieves the safest way to isolate systems relying on valves. It is a step change in achieving a new level of ALARP conditions and thereby allowing our customers to keep their plant, platform or pipeline running while executing any kind of maintenance or repair activities on a part thereof.