PIGGING PRODUCTS & SERVICES ASSOCIATION

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Pigging Industry News

the newsletter of the Pigging Products & Services Association

THE PRESIDENT'S LETTER

By Jan Frowijn, ROSEN Group, USA

It was great to be back face to face again and meeting up with familiar faces and getting to know new ones at the PPSA seminar that took place on 16th November in Aberdeen, UK. Ten excellent papers were presented by pigging experts alongside an exhibition. The papers are now on the website at https://ppsa-online.com/papers.php.

We are looking forward to our golf tournament that is taking place on Monday 6th February at the Wildcat Golf Course in Houston, USA. Thanks to our sponsors for supporting this event and to the players for making it an exciting competition. We are raising money for the Young Pipeline Professionals (YPP) around the world to support them with their mission of 'helping young newcomers to the industry to gain knowledge, experience and an understanding of different facets of pipelines'. There is still space for teams and individual players to join the golf tournament fun. Details and registration are at https://ppsa-online.com/golf.

On 7th February we will be holding the Annual General Meeting at 3pm, in the George R Brown Convention Center, room 380A, Houston, USA. Everyone is invited to attend and it's a great way to contribute to the PPSA Association and help us with future ideas / strategy.

We are exhibiting at PPIM booth 822 and so please pop by and see us if you have time. It is always fantastic to meet with you in person and to meet new people. PPIM is such a great conference we always enjoy the buzz of it and seeing people there. It is one of the highlights of our year. Another excellent conference that we will be exhibiting at this year is the ptc Conference in Berlin, Germany, 8-11 May.

As well as the face to face events PPSA has shared technical information this year through its webinars and has handled hundreds of technical and sales enquires. Our members are always ready to support you with your enquiries and projects. For further information please see our website at www.ppsa-online.com.

NEW Members

Full

Athantic Oil Services Ltd, Nigeria

Associate

Eagle Polymers LLC, USA

Thanks to all the golf sponsors for their support of the PPSA golf tournament on February 6, 2023 at the Wildcat Golf Club, helping us to raise money for Young Pipeliner Professionals (YPP) in the Industry

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PPIM 2023 Pipeline Pigging and Integrity Management 35th YEAR

A custom challenge yields a custom product—Apache Pipeline Products

A custom challenge
This fall, a client contacted **Apache Pipeline Products'** sales department, detailing the unique situation he was needing a solution to. A custom challenge that required a custom product.

Within mainland British Columbia, the client had over 80 kilometers (49.7 Miles) of NPS 36 pipe that required an aggressive clean. The pipe had been damaged during a recent flood causing significant scale and calcium to build up within the pipe's walls.

The client was intending on refurbishing this pipe for new build construction, thus, an aggressive clean would need to be completed before proceeding with any construction using this pipe.

This project proposed unique challenges to Apache's Engineering team, pigging equipment would need to be customized to achieve an aggressive clean on this piping. The first challenge was that the pigging equipment would not be able to be propelled through the piping using pressure as it typically would. The 80 kilometers of piping the client had was still in individual lengths of pipe, never welded or constructed together.

Apache's Engineering team proposed a custom 36" EXDR Knife Pig (photo). With 58 - scraping knives consisting of Tungsten Carbide, these knives provide the most aggressive clean by folding when sent down the pipe, the long knives are forced downwards and create a barrier between the pipes wall to force any obstruction in their path to give way.

The EXDR was also to be fitted with additional brushes, 12 - XB Brushes fitted in the middle of the pig, and 3 - Ring Brushes fitted on the top, middle and bottom, for removing the internal build up that the knives aggressively scrape away from the internal walls.

The EXDR Knife pig was completed by Apache's skilled fabricators in only 6 days and once complete, this pig weighed over 1100 lbs. of aggressive cleaning power.

Lastly, this custom EXDR Knife Pig was also fitted with a custom reinforced Aircraft Cable - used to attach to a winch & clevis, the knife pig was then dragged through the pipe lengths using a winch & cable.

For pigging equipment that is too large or heavy to maneuver into place, a Pig Tray is the perfect tool during your maintenance operations. A Pig Tray is not only for displaying our Industry Leading Pigs, but will assist in the Field when Launching and Receiving your pigging equipment.

Apache Pipeline Products' EXDR Knife Pig

ROSEN USA announces educational partnership with Oklahoma State University Institute of Technology (OSUIT)

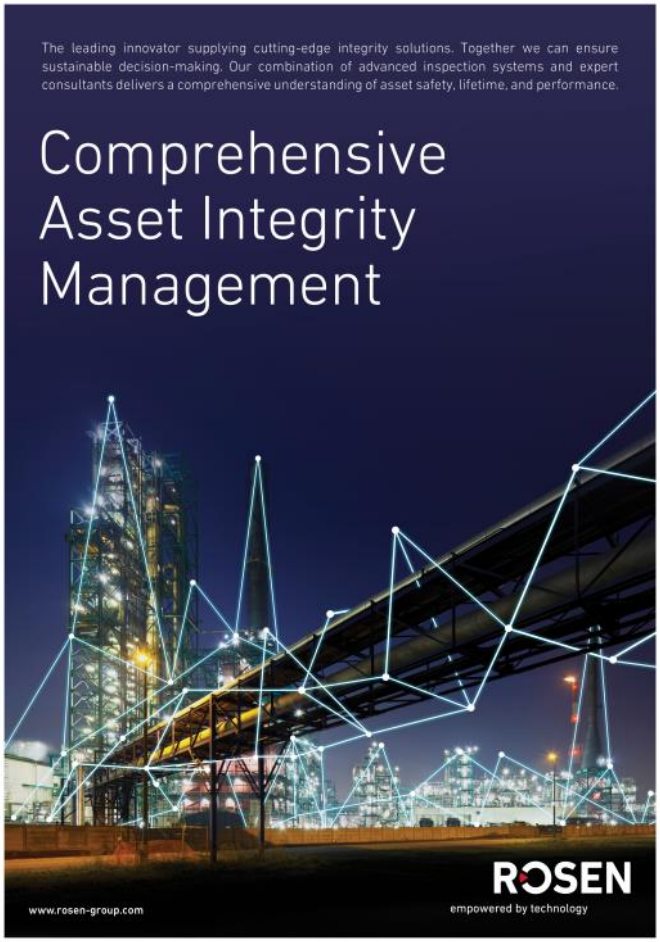
ROSEN USA is excited to announce its educational partnership with **Oklahoma State University Institute of Technology (OSUIT).** ROSEN shares a common goal and vision with OSUIT to help retain and transfer industry knowledge to equip students for their future and create a safer and more sustainable environment.

As an educational partner, ROSEN provides memberships and access to supplemental learning materials specifically selected to complement and enhance OSUIT's Pipeline Integrity Technology curriculum on their learning platform, the Competence Club. The Competence Club is the pipeline industry's premier learning and collaboration platform, connecting students with experts, their insights, and learning materials about integrity management, including pipeline operation, inspection, integrity, and risk.

OSUIT students pursuing their Associate in Applied Science in Pipeline Integrity spend their third semester of study in a paid internship. ROSEN offers students interested in exploring a career as a Field Service Technician or a Maintenance / Electronic Assembly Technician a world-class Internship experience. These paid Internship opportunities are offered to students from May - July in Houston, TX and include housing for the duration of the program. This is an excellent opportunity for motivated students in the Pipeline Integrity Technology or the Instrumentation Engineering Technologies program to gain valuable industry insight into the mid-stream oil and gas industry.

The Field Service Technician Internship program affords students the opportunity to work under the mentorship of a Senior Field Service Technician to learn the entire process of launching and receiving an In-Line Inspection tool. Students receive first-hand experience dealing with pre-job safety meetings, listening to client briefings to clarify the inspection run circumstances, and validating survey data for completeness and quality. The Maintenance Assembly Technician Internship program is geared towards the Instrumentation Engineering Technologies and will provide you the opportunity to work hands on repairing and testing mechanical components of in-line inspection tools. This particular internship program is located in ROSEN's workshop, and no travel is required.

Founded in 1946 and located in America's heartland, Oklahoma State University Institute of Technology



is a recognized leader in applied technology education. They are known for their world-class teaching facilities, academic coursework and practical training environments using industry-caliber equipment, students are prepared to enter the workforce as highly qualified industry professional.

OSUIT offers thirty-eight programs of study that lead to Associate in Applied Science degrees, Associate in Science degrees, or Bachelor of Technology degrees.

Oklahoma State University Institute of Technology programs of study are approved by the Board of Regents for Oklahoma State University and the A&M Colleges, the Oklahoma State Regents for Higher Education, and the Oklahoma State Accrediting Agency. OSU Institute of Technology, a public state-supported institution, has been accredited by the Higher Learning Commission since 1975.

The Pipeline Integrity Technology curriculum at OSU Institute of Technology enables students to develop the skills and knowledge required to be successful in the pipeline industry while earning their Associate in Applied Science in Pipeline Integrity in only two years.

CDI's Qube debuts at PPIM

CDI, the industry leader in pig tracking technologies is debuting the Qube, their latest and most innovative device ever at the **Pipeline Pigging and Integrity Management conference (PPIM)** in Houston, Texas.

The Qube, at its most basic, is an industrial-grade Internet of Things (IoT) Above Ground Marker (AGM), placed temporarily on a pipeline to monitor for the passage of pipeline pigs. As passages occur, the Qube uses a variety of means including cellular and satellite transmission capabilities to send its data to CDI's cloud service, GlobalTrack, in real-time. The Qube automatically sends GPS, magnetic and geophone audio data to GlobalTrack in real-time. This data is then presented to the user instantaneously, and subsequently used to create accurate and detailed reports on the entire job, including exact passage times, tool speeds, location of the devices on the pipeline and more. This automatic input from the Qube devices is designed to reduce or eliminate the need for manual input from field personnel and to improve the efficiency and safety of the pigging process.

The Qube works hand-in-hand with GlobalTrack over the internet, allowing for easy monitoring, setup, configuration and control of devices anywhere in the world. The Qube is equipped with a variety of technical features that make it a powerful and versatile device. One of the Qube's key features is its ability to detect up to eight frequencies of magnetic transmitters attached to the pipeline pigs. This allows the device to distinguish the passage of as many as eight different pipeline pigs, which can help to improve the accuracy and efficiency of the pigging process.

Additionally, the Qube also has a built-in geophone, which allows nearby users to listen to audio of pigs inside the pipeline via Bluetooth. Remote users can listen to the geophone over the internet via GlobalTrack. This capability can be particularly useful when AGM presets are used, as tracking personnel can monitor the audio from the upstream preset while being located farther downstream.

The Qube's built-in GPS receiver allows the device to know its precise location and transmit that data to GlobalTrack. This can be especially useful for companies that operate pipelines in remote locations as the location of Qube devices, whether rented or purchased, can be monitored in GlobalTrack's map interface. The Qube is, of course, designed to be rugged and durable, able to withstand harsh environments between -40 and +85 degrees Celsius. The Qube's power long-life battery system is built upon rechargeable batteries which are recharged via a standard USB-C fast charge system. This saves money on disposable batteries and allows the Qube to be recharged quickly and conveniently with common cables and connections.

The Qube has four expansion slots which allow for expandability and future-proofing of the device. This means that as new technologies and innovative ideas become available, the Qube can be easily upgraded to take advantage of them with inexpensive expansion modules rather than purchasing entirely new devices, making the Qube a secure long-term investment. Another strong ROI feature is Qube's ability to download firmware updates automatically over-the-air (OTA). OTA updates mean that the device will continue to receive firmware updates, new features, customizations and bug fixes for the life of the product. This ensures that the device stays up-to-date and continues to perform at its best.

The Qube's integration with GlobalTrack, CDI's cloud-based service, allows for easy access to data, real-time alerts, and detailed reports. This powerful cloud-based service has recently integrated pressure monitoring, which can detect the passage of pipeline pigs using pressure alone, GlobalTrack can display charts of the pressures inside the pipeline, individual sensor pressures as well as the differential pressure between two points.

Simply put, the Qube, when coupled with GlobalTrack, have the potential to revolutionize the way pipeline pigs are tracked and monitored. Its integration with GlobalTrack allows for fast, easy, access to data, real-time alerts, weather, and detailed reports, making it a powerful and complete solution for monitoring and tracking pipeline pigs and ensuring the integrity of pipelines.

12” Remote Tecno Plug Isolation, Valve Changeout, Malaysia

STATS Group was contracted to provide isolation and reinstatement leak-testing of a 12” shutdown valve on a platform offshore Malaysia. STATS supplied a DNV type approved Remote Tecno Plug® to provide a fully monitored, leak-tight dual seal isolation of the pressurised oil export pipeline, providing safe worksite conditions to allow the shutdown valve to be removed and replaced.

A site survey and gauge pigging run was conducted at the platform to gather information critical for the successful deployment and pigging of the Remote Tecno Plug. Prior to deployment of equipment to the platform a full Factory Acceptance Test (FAT) was performed in a purpose-built test-fixture, fabricated to simulate the client pipeline configuration. Upon successful completion and independent witnessing of all FAT operations the equipment was mobilised to the platform.

Once onsite the pig launcher was drained, vented and purged to allow the isolation plug to be loaded into the launcher. The Tecno Plug was pigged with water and constantly tracked 15 metres around a 5D bend and passed the Shutdown Valve. Pigging was halted once the Tecno Plug reached the exact isolation location and the plug was hydraulically activated to engage the locks and dual seals against the pipe wall.

Communication was achieved using an extremely low frequency inductive system which sets and monitors the Tecno Plug throughout the isolation. As part of the isolation barrier proving sequence, each seal was tested independently with full pipeline pressure in the direction of the expected pressure differential, proving both seals of the double block isolation are leak-tight. The annulus between the Remote Tecno Plug seals was then vented to ambient to create a zero-energy zone. With the pipeline vented behind the Tecno Plug an ‘Isolation Certificate’ was then issued to the client.

With the 20 bar isolation of the pressurised export pipeline in place and the double block and monitored isolation verified the valve replacement workscope was safely conducted. The Tecno Plug was constantly monitored and remained stable for the full six-day isolation period. Once completed a reinstatement leak-test of the new SDV was then conducted against the rear of the Tecno Plug while the isolation was remined undisturbed.

Upon completion of the reinstatement leak-test, the pipeline pressure was equalised allowing the Remote Tecno Plugs to be hydraulically unset and pigged back to the launcher.

A spokesperson for the operator said: “The use of the Remote Tecno Plug allowed the SDV to be safely replaced without the need to drain or water flood the export pipeline. Compared to the conventional method of water flooding which required a minimum 10-day preparation, the valve replacement activities were completed within 6 days and reduced the number of personnel required to complete the operation”.

Gareth Campbell, Regional Manager for Asia Pacific at STATS Group, said: “The isolation scope was completed as planned and incident-free which is testament to the teamwork and good communication between all parties. The use of the Remote Tecno Plug enabled the valve replacement to be completed efficiently, significantly reducing the platform shutdown compared to conventional methods.”

12 inch Remote Tecno Plug

American Pipeline Solutions - Ice Pigging case study – Succeeds where others have failed

Author: Shane Garner

Ice pigging, a sustainable cleaning method for potable water distribution mains and wastewater force mains. Developed in the United Kingdom and introduced to the United States in 2012. The method involves pumping a slurry of ice into a main through a hydrant or other existing fittings and using system pressure to push the ice pig downstream to an exit point through a similar fitting. The ice slurry, filling 20 to 30 percent of a pipes volume, cleans with a shear force between 100 and 1,000 times greater than water alone and provides more effective cleaning and uses significantly less water than traditional flushing methods.

Introduction:
An ice pig works like a glacier does. Rather than bulldozing sediment and biofilm it consumes them into the ice. The ice pig enters and exits through a hydrant, therefore specialized launching and retrieval stations are not required as with mechanical pigging or swabbing. Customer service isolation usually is not necessary with Ice Pigging. Inorganic sediments and debris like iron can accumulate in on water distribution system pipe walls causing pipeline restrictions and build up. These restricted flows can cause increased discoloration in water and the quality of the water provided to the customer. Other technologies like flushing and water-jetting are inefficient and sometimes ineffective. In addition, these processes use a lot more water, which may not be readily available.

Background:
Ice Pigging is an award-winning, innovative, low-risk, advanced pipe cleaning technology to clean drinking water pipes, sewer force mains, and siphons. The ice slurry can be inserted and removed through fire hydrants, (figure 1) line taps, and other existing fittings so that expensive excavations are not required. Ice Pigging harnesses the characteristics of a semi-solid material that can be pumped like a liquid but behaves like a solid (figure 2) once the pig is formed in the pipe.

Ice Pigging relies on the natural glacial effect of ice to pick up unwanted sediment, it uses approximately 50 percent less water than standard water flushing and takes significantly less time. Typically, the section of pipeline being cleaned is out of service for no more than 60 minutes.

A main feature of Ice Pigging is that it cannot get stuck permanently. If for some reason the pig were to get stuck, time would be allowed for the ice to melt and flush it from the pipeline. Pipe bends, changes in diameter, or butterfly valves can all pose problems for swabbing or pigging, yet ice pigs can easily negotiate these obstacles.

To launch and receive traditional pigs, excavations may be required to allow the installation of launching and reception stations. This can mean extensive and costly interruptions to any system and may require the installation of bypass pumping or a temporary water supply. Ice pigging is far less intrusive to any system it's used on.

Figure 1. A typical set up for inserting ice into a water main pipeline using a hydrant and two-and-a-half-inch fire hose.

Figure 2. showcases how the ice slurry is formed into a solid know as an "ice-pig" once pumped into the pipeline.

The Benefits:
Ice pigging represents a sustainable best practice and unique approach to pipe cleaning. The advances include:

- It's efficient, rapid, and environmentally friendly.
- Combines operational benefits of flushing with the impact of solid pigging.
- Ice slurry injects through existing fittings.
- System pressure pushes the ice.
- Suitable for pipes of all sizes up to 24 inches and materials.
- Effectively removes biofilm, iron, manganese, FOG, grit and sediments.
- Produces quantifiable results.
- Exceptionally low risk

Methodology:
To maintain the correct consistency of the ice pig a freezing-point depressant is used. A food-grade fine table salt which is approved by the National Science Foundation (NSF), is dissolved in potable water. This is always sourced from a public water supply. The current maximum batch capacity is 2,700 gallons.

The brine is made in a 316-stainless steel delivery tanker and hose connections are made to the ice machines that are mounted on a separate trailer (Figure 3). The brine is fed into the ice machines which in turn freezes the liquid and returns it to the delivery tanker. This cycle continues until the ice slurry is at the correct thickness known as the "ice fraction". Ice fraction measures the amount of ice crystals as a percentage of total volume.

Typically, the thickest ice is used on plastic and sound concrete-lined pipes as well as asbestos cement, but when older unlined cast iron pipes are cleaned a thinner ice slurry is used that does not clean as aggressively. The thinner ice slurry will not disturb the buildup of tuberculation, which could damage the integrity of an old heavily corroded unlined cast iron pipe.

Figure 3. Ice production setup showing the delivery rig (left)

Ice Delivery:
Setup for delivery varies slightly for each different application. In a typical setup for a potable water main the delivery rig connects to the inlet hydrant or other suitable fitting (2 inches or greater tapping with valve control), and at the outlet, a flow analysis system is connected. This system measures and records the flow, pressure, conductivity, turbidity, and water temperature as the water and ice are discharged. Once set up, the main is flushed briefly to note and record pre-flush readings. The main is then isolated by the owner's operators and the required amount of ice is pumped into the main. At the same time, the outlet hydrant is opened to create a flow and allow water to be displaced as the ice enters the main. With careful control between the inlet and outlet, the flows are balanced to allow slightly more ice into the main than the amount of water being displaced. This has the effect of the ice forming as a pig against a pressurized wall of water.

Once the required amount of ice is in the main, the delivery pump is turned off and the upstream valve is opened to allow the system flow and pressure to "push" the ice pig along the main toward the outlet hydrant. The flow rate is controlled by the outlet operator at this time. As the ice pig approaches the outlet, the conductivity reading will rise as the salty water of the melting pig arrives in front of the pig. The monitoring equipment will show the water temperature falling and conductivity rising as the ice arrives.

At this stage, the operator may collect samples of the ice at regular intervals for later analysis. (Figure 4) The temperature and conductivity will return to pre-flush levels when all the ice and salty water has flushed out of the system and the flushing shall continue briefly to allow the turbidity levels to return to pre-flush levels or lower according to instructions from the owner. The main is then returned to normal service. No disinfection is necessary.

Case History:
Local water source containing high levels of iron and other inorganic sediment that had accumulated on water distribution system pipe walls resulting in water discoloration complaints throughout the city due to historic use of mine tunnel waters. In 2016 Park City in collaboration with the Water Research Foundation, published results of an advanced main cleaning pilot testing program that for the first-time compared ice pigging to high velocity unidirectional flushing (UDF) and foam swabbing. As documented in *Project #4509 Metals Accumulation and Release Within the Distribution System: Evaluation and Mitigation,* ice pigging was over 100 times more effective at removing metals. In 2021, Park City contracted with American Pipeline Solutions (APS), who worked closely with its Distribution and Water Quality teams for over 6-weeks to ice pig one of Park City's most metal-accumulated impacted residential neighborhoods, that in the past had experienced a metals release event.

Customer Goals:
Remove accumulated lead, manganese and thallium, complimented by very strong removal of iron and arsenic sediment build-ups in the water distribution system.

Solution:
A pre-project desktop study was carried out by APS technicians to prepare a planned schedule of runs to clean 74,000 LF of various pipe materials ranging from 6" – 14" in diameter using the advanced pipe cleaning technology, ice pigging. The size of the distribution area required 17 x 10-ton loads of ice slurry delivered one load per day. A post project report would be compiled, showing the chemical, biological, and mechanical.

Results:
Ice pigging resulted in nearly complete removal of accumulated lead, manganese and thallium complimented by very strong removal of iron and arsenic. Removing this material has allowed the Park City water quality professionals to sleep better at night since there is now limited risk of these metals being released. Anticipating no future loading of metals in the affected area means that future UDF requirements will be very limited.

Michelle De Haan, Water Quality and Treatment Manager, Park City Municipal Corporation said "APS's preplanning with Distribution operators was crucial to the success of the project, and their team of professionals worked seamlessly with our field crews…In upcoming years we'll be looking to APS to continue to employ this important and superior advanced water main cleaning technology in other metal-accumulated areas of our community".

Figure 4. Ice and sediment samples taken from the discharge

DEXON's Challenging Pipeline Inspection Archive – Case Study #276

With over 400 successful challenging pipeline inspections completed to date, **Dexon Technology** specializes in offering completely customized inspection solutions for the inspection of challenging pipelines. The following case study has been selected from Dexon's Challenging or "Unpiggable" Pipeline Inspection Archive.

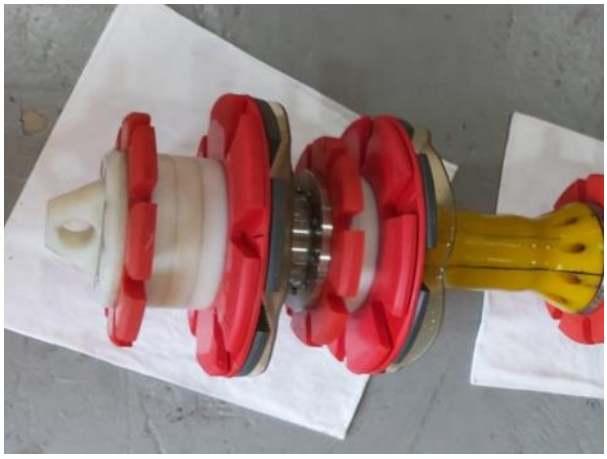
The Challenge:
Dexon was faced with a challenging pipeline inspection featuring multiple pipe diameters, back-to-back bends, a lack of launchers and receivers, and the complete absence of prior inspection data of a pipeline crossing under a busy urban intersection. The challenge was compounded by the combination of all these challenging inspection features being present in the same pipelines.

Multiple internal pipe diameters meant that the seal between the driving disks and the inside of the pipe wall would be lost in reduced sections, losing pressure and propulsion. Navigating back-to-back bends requires shorter tool segments, which can lead to buckling and as a result increase the possibility of a stuck tool. Additionally, back-to-back bends require higher pressures than typical inspections to propel the tool through the bends requiring additional tool development and testing. While a lack of launchers and receivers required onsite pipeline modification, a lack of previous inspection data and pipeline maintenance, and construction records meant that there were large unknowns. All in pipelines that cross under a major urban intersection in one of Asia's largest business districts, meant that pipelines could not be dug up in the case of a stall.

Specialists from Dexon's Research Development and Engineering (RD&E) department were called in to

design, fabricate and test modified tools to accommodate these operating characteristics. Inspection verification included complete pipeline configuration replication and testing at Dexon's 6-acre on-site test yard prior to inspection. Replicating exact pipeline conditions to ensure not only piggability but also adequate inspection data collection.

The Solution:
The inspection included multiple pipelines each with multiple Internal Diameters (ID). Including an 8" pipeline with reduced sections down to 6" (a reduction of 25%) and a 12" pipeline with reduced sections down to 10" (a reduction of 16.67%). Minor changes in internal diameter caused by geometric deformations and severe corrosion can be overcome via slightly enlarged driving disks and cups. However, to accommodate such drastic reductions in pipe ID, customized petal driving disks were developed that were able to maintain a seal in the larger diameters (12" and 10"), and then fold down and maintain a seal in the reduced sections.



The above image demonstrates petal driving disks unfolding in an expanded pipe section while maintaining a seal with the pipe wall.

Back-to-back bends pose difficulties to inspection teams as they require higher operating pressures to propel the tool through the bends. Additionally, as the tool's modular body sections move through bends the tool is pulled out of alignment and the transducers are moved out of the center of the pipe, resulting in a loss of signal and inspection data. To overcome this shorter tool bodies were developed with specialized spacing disks to ensure the tool remained in the center of the pipe while passing through bends.

Challenging pipeline features are replicated and tested at Dexon's 6 acre on-site test yard as part of Dexon's inspection verification program.

The lack of launchers and receivers required onsite pipeline modification, while the client required the asset to be online and in use during the inspection. Lateral Wye launchers and receivers were installed allowing for an online inspection without impeding product flow. Lateral Wye fittings pose difficulties to inspection teams as the seal is lost as the tool enters the wye which can lead to a stall in the bend. To ensure safe passage of the tool, an extended nose was developed that would push the tool around the bend and form a seal in the next pipe spool.

Custom-built lateral WYE launchers and receivers were installed allowing for inspection without disrupting product flow.

An absence of previous inspection data meant little was known about the pipeline under inspection. Incomplete pipeline construction and maintenance records missing crucial data could lead to issues during an inspection. High back welds, misaligned pipe spools, unbarred underground features, and high corrosion are only a few possibilities that can lead to a stalled tool. As the pipeline included a road crossing under a busy urban intersection in a major Asian metropolitan hub, digging up the pipeline to retrieve a stalled tool would not be possible. Additional onsite surveys and cleaning and gauging were required prior to the inspection to ensure piggability.

MFL instrumented inspection with speed control unit in a 28” gas pipeline with high operation flow

Background:
In southern Bolivia are concentrated the most of the country's natural gas producing fields. The so-called "mega wells" (because of their great pressure, bottom temperature and very high flow rates) flow through collectors towards large treatment plants that are finally connected through a single 28" export pipeline, passing the volumes of the production companies to the transmission company.

Naturally, there is a great responsibility to adequately maintain this asset of national importance, undoubtedly it is a critical point in the system since it contributes a large part of the product destined for the domestic market, as well as exports to Argentina and Brazil. This demand has been increasing over the years, causing the normal flow of product in the pipeline to sometimes reach the maximum nominal values allowed.

The pipeline operator required **Morken Group** to carry out an internal inspection in order to verify the integrity of the pipeline. The challenge posed was to find the technical solution that would allow the inspection to be carried out without reducing the flow rates of the line, also considering that the quality of the information recorded by the instrument should be maintained.

The solution:
The Morken Group engineering team evaluated the situation and proposed to the Maintenance Management and the Integrity Department of the client to use a GEO & MFL instrumented inspection tool with Active Speed Control Unit.

The Active Speed Control Unit is an automated unit, designed to maintain the speed of the tool in the desired range by means of special valves.

The opening and closing of these valves are activated and operated by independent motors which are in turn controlled by the internal electrical system. Flow velocity is measured using the odometer and pipe openings and closings are kept optimized to keep the tool moving at the desired speed.

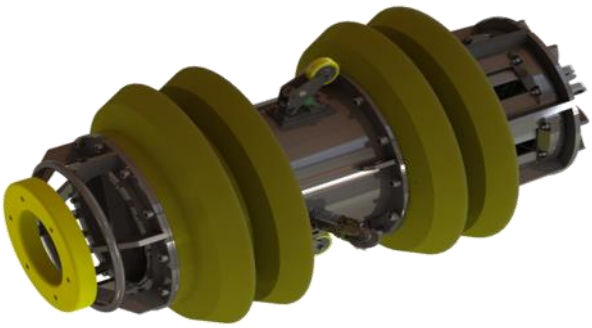
Thus, it was also necessary to adjust the Calibrated Plates tool and the Cleaning tool, this through passive bypass.

Results and benefits:
The Speed Control Unit allowed the inspection to be carried out at flow rates much higher than those reached by conventional tools, enabling the inspection of a pipeline with a high nomination throughout the year.

The data collected was sufficient to produce the Fitness For Service reports, providing the customer with options for repair plans, recommended re-inspection interval, and confirmation of acceptance of metal loss characteristics to work MAOP at the time of inspection. inspection.

According to the geo-referencing of the anomalies by means of the IMU (Inertial Measurement Unit) module incorporated in the Geometric PIG, the report of the anomalies with their spatial location was delivered to the client in order to be reproduced by high-quality geodetic methods. resolution, which were used to locate the points corresponding to the sectors selected for verification by the client, together with the respective excavation sheets provided in the final MFL report.

Pig with 28” Gauge Plates being introduced into the throwing trap.



Speed Control Unit

Speed Control Unit (front body - right) and GEO Tool (rear axle - left) before the run

YPPE at PPSA Seminar 2022 and new chair announcement!

Young Pipeline Professionals Europe (YPPE) were delighted to present a short message at the **PPSA** Seminar held in The Ardoe House, Aberdeen on the 16th of November. Outgoing chair, Marguerite Forde (**ROSEN, UK**), took to the stage and reflected that with the energy transition looming, the pipeline industry is understandably concerned with the engineering and technical uncertainties that we face. However, one of the main challenges YPPE has seen in recent years is the attraction and retention of talent (Refs: [1,2,3]) to support tackling the engineering and technical obstacles in the pipeline world, in addition to the knowledge transfer that goes hand in hand with bringing new resources on board.

There are many studies and reports documenting the importance of knowledge transfer and mentoring for staff retention, and we have heard about the "silver tsunami" for many years, but rather than present more facts and statistics, YPPE chose to present something more visual. Marguerite invited the audience to stand and as everyone manoeuvred to the request, she reflected on the UK's net zero greenhouse gas targets for 2030 and 2050. Marguerite then asked those who would be retired by 2030 to sit, and after some consideration and gentle mental math, many the audience sat down. With this being only 7 years away, and while seeming like sufficient time for knowledge transfer, the industry experts in attendance looked around: if they expected others in the industry to transfer knowledge instead of themselves, those individuals were also sitting now! The exercise was repeated for the 2050 targets, and there was only a handful of young professionals remaining standing in the end – those that would most likely work their entire careers to fulfil the energy transition…

There is no silver bullet to solve this challenge: but based on the discussions following the presentation, it seems there is a renewed commitment across the audience to work on this.

As 2022 turns to 2023, so does the YPPE chair change: with Sameera Naib (ROSEN, Netherlands) taking on the role, supported by an expanded committee of motivated young pipeline professionals from across Europe. We appreciate PPSA's continued support as YPPE grows. If you want to join or support our community, or learn more about our new committee and activities, please visit our website http://www.yppeurope.org/ or our LinkedIn page.

1. *McKinsey & Company: "When the grass is truly greener: How companies are retaining frontline talent", January 31, 2022*
2. *"The Skills Crisis in the Pipeline Sector of the Oil and Gas Business", Professor Phil Hopkins, Published in Journal of Pipeline Engineering, Volume 7, Number 3. September 2008.*
3. *Engineering UK: Engineering 2015 — The State of Engineering*

3X ENGINEERING repairs subsea corroded pipeline, Qatar

The goal of this repair, performed in September 2022 by **3X ENGINEERING (3X)** local distributor **POWER ENGINEERING CORPORATION** under the supervision of 3X Subsea Specialist was to reinforce a 8" oil pipeline suffering from 3 internal corrosion defects at 15-meter depth. To restore pipe integrity and prevent further deterioration, it was decided to repair the defected area using 3X composite repair solution REINFORCEKiT® 4D SUBSEA (R4D-S), specially designed for subsea environment.

According to ASME PCC-2 standard and 3X calculations, it was decided to apply REINFORCEKiT® 4D SUBSEA (R4D-S) using R3X65S resin. Twenty-six layers of R4D-S have been determined to repair the pipe over 800mm. Preliminary operations were performed underwater before composite wrapping: pipeline excavation, defect localisation, concrete removing and surface preparation by gritblasting to get a good surface profile superior to 60µm. Composite wrapping was performed by divers previously trained and supervised by 3X Subsea Specialist who checked the product implementation remotely (from control room).

See below the main stages for composite repairs
1/ P3X30 subsea primer was applied on the defects to provide good adhesion between the pipe and composite plates.
2/ Composite plates recovered with F3XSB high performance subsea filler were positioned to cover 2 defects out of 3 and fastened with ratchet belt until curing was done (1 plate 130x130mm and another one 100x100mm - no plate was needed for defect No.3).
3/ P3X30 subsea primer was applied on the whole surface to be repaired to ensure perfect adherence with composite wrapping.
4/ Composite wrapping was then completed using Kevlar® tape impregnated with R3X65S subsea resin. The tape impregnation was performed using BOBIPREG (3X specific device allowing quick and regular impregnation resin/fiber) in a storage and preparation space and then transfered to divers for application underwater.
==> 26 layers were applied over 800mm length to cover and repair the 3 defects.
5/ Last layer of P3X30 subsea primer all over the repair and plastic grid were installed as protection. Id plate was finally installed for traceability.

Samples of resin were taken during each tape impregnation for quality control. Hardness measurements were performed 3 days after job completion and concluded this successful subsea repair despite the constraints to work in subsea environment and the limited time to perform the repairs because of the depth.

VKVC Pig Valve Installation

Urbanization is expected to increase to 83.7% in Europe by 2050 [1]. 4.4 billion people i.e. 56% of the world's population is currently inhabiting cities that is estimated to double by 2050 [2]. Growing energy consumption is an indispensable by-product along with the omnipresent problem of space availability.

Traditional Pig Launcher and Receivers have a proven track record. Traditional Pig Traps require a large area for setup. For locations where this may be an issue a smart alternative is the "**VKVC** Pig Valve".

VKVC Pig Valves have the capability to be used as an alternative to shut-off valves in addition to function as Pig Traps. Pig Valves are supplied with ASME 'U' stamp marked Quick Opening Closures that provide for a quick and easy method to insert and remove pigs from the pipeline.

VKVC has designed, installed and commissioned Pig Launching and Receiving Valves up to 16 inch Diameter and Pressure Rating of Ansi 900. VKVC Pig Valves are suitable for launching of Inspection tools of sizes 8", 10" and 12" of some Inspection companies. The valves are available with automatic launching Pig Magazines.

[1] https://knowledge4policy.ec.europa.eu/foresight/topic/continuing-urbanisation/urbanisation-europe_en visited on 18.01.2023 1158 hours IST
[2]https://www.worldbank.org/en/topic/urbandevelopment/overview#:~:text=Today%2C%20some%2056%25%20of%20the,people%20will%20live%20in%20cities

VKVC Pig Valve

18th Pipeline Technology Conference provides comprehensive overview on global pipeline trends

The 18th **Pipeline Technology Conference (ptc)** is set to take place in Berlin from May 8-11, 2023. Europe's premier address for pipeline industry professionals will offer a look into the pipeline future, with a broad range of 1-day seminars, panel discussions, technical sessions, operator round-tables, award ceremonies and social events.

ptc 2023 will bring together the industry elite – pipeline operators, industry leaders, experts, and young talent – to discuss the latest developments and advancements in pipeline technology. Key topics for 2023 will include hydrogen, methane emissions, safety and security, climate adaption, geo-hazards, CO_2 transportation and a regional focus on the booming African continent.

The gathering will also offer a multitude of technical presentations, including 6 concurrent technical tracks with more than 120 speakers. Participants will have an opportunity to learn from industry experts, network with peers, and form first-hand impressions of the latest trends and developments in the international pipeline industry. All papers will again be published on an open access basis.

Indeed, a special focus will again be devoted to the area of promoting young talent. ptc 2023 will feature a variety of opportunities for young people to get involved into the organization of the event and it will host different awards ceremonies for both students and young professionals. The **EITEP Institute** is committed to fostering the next generation of pipeline professionals and cooperates with different young pipeline professional communities from around the world.

The exhibition will showcase the latest products and services from leading pipeline operators and service companies. More than 85% of the exhibition stands are already booked.

For more information on the 18th Pipeline Technology Conference, please visit the conference website at www.pipeline-conference.com.