PIGGING PRODUCTS & SERVICES ASSOCIATION

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Pigging Industry News

the newsletter of the Pigging Products & Services Association

THE PRESIDENT'S LETTER *By Iain Shepherd, Halliburton, UK*

As this is the first newsletter since our AGM in February, I'd like to introduce myself as President of the PPSA and Chuck Harris as Vice President; also we welcome our new directors: Simon Bell and Michael Rapp to the board. I'd like to thank our past Presidents Mark Slaughter and Steve Mayo and past directors Evert Witkop and Paul Mallaburn for their hard work and contribution to PPSA and give a huge thank you to Diane Cordell for her continuing dedication to the PPSA.

In February we had 3 events in Houston: Our golf tournament on the 8th February, followed by our Annual General Meeting on the 9th, also we exhibited at the PPIM conference. In April we exhibited at the POMME conference in Bahrain in April, PPSA's first time in the Middle East. PPSA also exhibited at the PTC conference in Berlin and in September we will be exhibiting at the IPCE in Calgary for the third time. In November, we will be running the annual PPSA pipeline pigging seminar and exhibition in Aberdeen. We hope you are able to attend and contribute to the continued success of this event.

The current low oil and gas prices are creating challenging conditions for most of us who are involved in the energy industry. Spending on new construction and maintenance has been cut dramatically and every day we are hearing of job losses and businesses closing. The PPSA's role is to "To promote the knowledge of pigging and its related products and services by providing a channel of communication between the members themselves and with users and other interested parties." In these difficult times the PPSA can assist by opening up communication to new and emerging geographical and business areas, extending our reach globally and expanding into areas of industry that we may not have explored fully before. I encourage all of us to take full advantage of the assistance the PPSA can give, and remind you of the email address for our technical enquiry and supplier service: ppsa@ppsa-online.com it's



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encouraging to see that despite the market conditions, this service is strongly used and continues to bring new business leads on a daily basis.



PPSA exhibits at conferences : POMME Bahrain (top) and PTC Germany (below)

PPSA annual golf tournament Houston 2016 Results:

First place: Dennis Boudreau Garth Williams JD Jaegar Ryan Tebeest

Second place: Chuck Cardiff Ryan Fortner Bronson Guttierez **Third place:** Dean Dodson Lance Shepherd Tharon Cummings Courtney Zimmerman

Closest to the Pin: Dennis Boudreau

Longest drive: Tyler Trujillo

A huge thanks to our golf tournament sponsors:



Industry news

PECAT® - measuring residual debris in "clean" pipelines

The routine deployment of **Pipeline Engineering's** PECAT[™] debris assessment tool is delivering improved cleaning performance in pipelines, which suffer from build-ups of hydrocarbon deposits.

Pipeline Engineering, a CIRCOR Energy brand, started development of its patented and ATEX certified PECATTM technology in 2007, with its first deployed unit in 2011. The question PECATTM addresses is quite simple, "Just how clean is a pipeline?" This is an unknown that has challenged the industry since the first pipelines were installed. The fact is that not knowing the volume and location of debris deposits means that there is increased risk and uncertainty when cleaning pipelines. This can result in conservative and overly complex cleaning programmes. These can then, paradoxically be ineffective, which can be particularly critical when the line is being cleaned prior to an Inline Inspection survey. Residual debris can compromise inspection runs, resulting in incomplete surveys, with consequential pipeline integrity and cost implications for the pipeline operator.

The PECATTM is deployed as a single standalone unit, as opposed to being built up as different modules. It comprises a data logger within the body of the pig, around which a series of spring mounted debris sensors are deployed. The sensors are supported on the end of caliper arms. The combination of the caliper arms and the debris sensors provide both a measure of the residual bore, and the offset from this residual bore to the internal surface of the pipe (the pipe ID). This then gives a true measure of debris volume and its distribution along the length of the pipeline. The PECATTM can be constructed to reflect a preferred pig configuration (disk, cup, and in whatever combination). It is also designed to measure and pass debris deposits of approximately 20% of the pipe ID.

PECAT[™] can be run in a bore-finder mode to assess levels of residual debris. Alternatively, it can be deployed as part of its routine cleaning offering to allow the effectiveness of a cleaning programme to be gauged as it is implemented. This enables PE to change the cleaning programme dynamically as it progresses, and to evidence when a required level of cleanliness is reached. These assessments are made using in-house developed software and data analytics.

The benefit of PECATTM is the direct measure of residual debris in a pipeline, whilst other techniques, such as data loggers and flow studies, imply a volume. PECATTM is able to give the measurement resolution and accuracy necessary to generate information to optimise cleaning programmes to assess when a line has reached a specified cleanliness level.

PECATTM is now an established service offering that can survey lines from 12" - 60".



Pipeline Engineerings's 30" PECATTM

Pigging Products



IK design and manufacture in-house solutions to your pigging challenges for either standard products in new applications, operational changes in pigging activities or special "one-off" solutions to resolve your immediate needs.

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Transneft Diascan, JSC's new generation inspection tool

In 2015 **Diascan** developed a new generation inspection tool – an inspection complex "Ultrasonic inspection tool 40-DKP.00-00.000" for detection of arbitrarily oriented defects. The inspection tool covers the following diameters: 40", 42" and 48".

The inspection tools for detection of arbitrarily oriented defects are high resolution tools and are designed to detect defects in pipe wall and welding seams (longitudinal, girth and spiral). The tool has two ultrasonic measurement systems: with straight ultrasonic beam (wall measurement (WM) method) and slope beam (crack detection (CD) method) with CD sensors oriented in nine directions relative to pipeline longitudinal axis. Due to this the tool is capable of detecting crack-like axial and circumferential defects, as well as defects in spiral welds and other defects in any orientation relative to pipeline longitudinal axis. Moreover, in comparison with previous versions the tool has 1.5 times higher WM measurement system resolution.

The tool can find such defects as metal loss, gouges, laminations and arbitrarily oriented crack-like defects.

Standard specifications:

Tool diameters	40"÷48"
Pipeline product	Liquid
Temperature	-15°C ÷+50°C
Max. operating pressure	14 MPa
Operating velocity	up to 2 m/s
Min. bend radius	3D
Pipe wall thickness	4 ÷ 29 mm
Max. length of inspected pipeline	200 km

The in-line inspection tool for detection of arbitrarily oriented defects is not the only innovation development of Diascan. The company also develops:

- inspection combo tools with 2-3 non-destructive test methods;
- ultrasonic WM inspection tools with higher resolution for enhanced detection of gouges;
- new generation magnetic inspection tools (MFL),

including those with circumferential magnetization unit (MFL circumferential);

- new dimensions of multi-channel geometry tools with navigation system;
- high-precision inspection tools (OPT) for 3D positioning of pipelines

Transneft Diascan, JSC is a subsidiary of Transneft, JSC. Diascan provides in-line inspection services as well as inspection of tanks and process pipelines. On average Diascan inspects 50 thousand kilometers of oil transmission pipelines, 4 thousand kilometers of oil product transmission pipelines and about 400 tanks a year. Diascan is present at the world in-line inspection market and has already worked in Kazakhstan, Belarus, Czech Republic, Slovakia and Mexico. In March 2016 Diascan will receive a European Certificate regarding conformity of Diascan design documentation with VdTÜV-Merkblatt 1069 standard.



Transneft Diascan, JSC's new Ultrasonic inspection tool

CDRIA Pipeline Services Ltd awarded Deloitte Technology Fast 50

CDRIA Pipeline Services Ltd. was awarded the Deloitte Technology Fast 50 for 2015. The company has been ranked as one of the 50 most dynamically developing innovation and technology companies in Central Europe. The Deloitte Technology Fast 50 in Central Europe is a programme that recognizes and profiles fast growing technology companies in the region. Technology Fast 50 award winners for 2015 were determined based on the revenue growth over four years (2011 to 2014). The Deloitte Technology Fast 50 in Central Europe is part of Deloitte's global Fast 500 programme.



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PIGGING INDUSTRY NEWS

How do MFL data contribute to Integrity Management of difficult to pig pipelines?

Interpretation and analysis of MFL data has achieved advanced level of accuracy and time efficiency also in the realm of difficult to pig pipelines and offers a reliable resource in the management of pipeline integrity. This paper presents introductory discussion of signal analysis followed by case histories of fast-zero-wallthickness reporting of illegal hot tapping of pipelines, defect assessment in seamless pipe with heavy noise signal, pinhole detection in non-piggable pipelines and detection of weld defects.

MFL tools have obtained a significant track record for determining the integrity of pipelines. The technology offers a solution for an otherwise almost insoluble problem: How do we address the integrity of large underground infrastructures other than by conducting extensive ground movement or taking the line out of operation? MFL tools apply advanced sensor technology in harsh environments and companies have developed powerful software to analyze large amounts of inspection data and report features that pose a hazard or threat to the pipeline and its environment.

The technology is now extended to pipelines that pose a challenge for a regular pigging operation. This challenge may originate from various perspectives. Construction and the lack available facilities do not offer the conditions to conduct a pigging operation, such as dead-end configurations, multi-diameter pipelines. Operational issues maybe another factor: pressure and flow are too low to achieve conditions to run a conventional ILI tool. There is also demand from the industry to obtain statements more rapid and more accurate about events that interfere with pipeline integrity other than the standard corrosion features. These include combined defects, illegal tapping, defects in weld area and small sized features in seamless pipe.

The MFL tool, although it has limitations of its own, is still considered the most wide spread technology for pipeline inspections. It is applicable in oil and gas pipelines, is more forgiving to pipeline contaminations than UT and it will always pick signals from even the smallest features like pinholes. The MFL tools are autonomous with onboard data storage, sensor technology and batteries. **Pipesurvey International** have developed tools that are versatile and compact. Using direct magnetization, the Pipesurvey International ILI tool is less sensitive to contamination since it has no brushes that will pick up magnetized dust from the pipeline. This reduces the risk of high friction or even stuck pigs at heavy wall sections or weld penetrations. The magnetizing system generates an even and strong field that helps discern small defects, even in the direct vicinity of larger defects. The tool is wheel-suspended, which furthermore reduces the pipeline friction and thus offers the possibility to inspect gas pipelines at pressures less than 20 bar.



The application of versatile MFL tool and Datsurvey ® software to difficult-to pig pipelines

The Pipesurvey International tool combines tri-axial sensor technology and integrated sensors for discrimination of internal and external corrosion in flexibly suspended sensor pads. The measuring module will give full wall coverage and at the same time has the ability to collapse in smaller diameters and so it offers the possibility to inspect multi-diameter pipelines. The tool is bi-directional and will pass through shortradius 1.5D bends so it will be used not only in long distance transmission pipelines, but also in short lines like jetties, tank farms and offshore.

Of equal importance to the hardware are the software and algorithms that support the analysis and reporting of the defects. Pipesurvey have invested in in-depth study of pull test data, field data, pattern-recognition and signal-analysis tools to take defect-analysis to a higher level and at the same time increase in timeefficiency of computer aided tool boxes.



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Multidiameter pigging using Active Speed Control

The first field application we discuss is the detection of small defects in seamless pipe with a very heavy noise pattern. Due to the manufacturing process, seamless pipe shows higher variation in the background signal than welded pipe. Much depends on the quality of this pipe for the level of variation. In modern pipes the pattern will be somewhat regular and be limited to approximately 12.5% of the signal. But in older pipelines, the signal will be highly irregular and may reach levels of up to 20% of the background signal, if not higher. This means that signal filters have limited capability of reducing the noise level and over -filtering may cancel-out the signal of small crevicelike defects that have a depth well over 20 - 25%. Pipesurvey have developed programs for signal processing to address this issue. The case history shows a defect with length of 6.7 mm, a breadth of 25.5 mm and a depth of 62% in a heavy noise seamless pipe. The defect was exposed and verified by field measurements. The UT field verification reported a peak depth between 50 - 61%, a breadth of 25 mm and a length of 13 mm. Part of this length however was below the threshold of 15% for seamless pipe. Taking in view the conditions of this pipe, the result is stunning and gives an unsurpassed confidence level for difficult to inspect pipelines.

An issue of raising concern to pipeline companies in many countries is the issue of illegal hot taps. Third parties approach buried pipes and use professional or amateur equipment to connect to the pipeline and divert product from the pipeline for black market. The activity is a major economic and safety concern. On a yearly basis the product loss may accumulate to millions of dollars and the interference with the pipeline may result in damage to the environment and even the loss of lives. The third parties have sometimes sophisticated techniques so as to create very low and small signals in the pipeline in order to hide the activity from the company or from the inspection company. Once the features have been detected however, it is important that they be reported accurately and fast, in order to take mitigating measures. Pipesurvey have developed tools and algorithms to report illegal hot tappings fast and accurately.

Small pinhole features and features in welded areas are another concern. Small pinholes give a weak signal and may easily lead to underestimation of the defect depth. Features in or near welds are difficult to size. The sensors will move and may experience liftoff from the pipewall. These phenomena will in itself create signals in presence of the magnetic field, which is otherwise variable due to wall thickness variations. The same will happen at complex features, like dents associated with metal loss and gouges. In these instances the accuracy of the measurement may be reduced to only 20% of the nominal wall thickness.

The above case history shows a combined geometric deformation of the pipeline and a metal loss defect. The deformation was reported with a dent depth of 7.5% and an ovality of 5%. The field verification measured a dent depth of 7.1% and an ovality of 5%. In spite of the sensor movement and lift off, the reported metal loss was well within 20% of the specified accuracy.

The case histories give evidence of the Pipesurvey technology and software which is applicable to piggable and so-called non-piggable pipelines. The technology applies to pipelines operating at velocities well above 4 m/s as well as to pipelines operating at velocities lower than 1 m/s. At the same time, pipelines in tank farms without launcher or receiver can be inspected using the bi-directional functionality of the Pipesurvey International tool. Multi-diameter pipelines, passing through environmental sensitive areas or in subsea configurations as well as small size pipelines are thus subject to the same standards of inspection technology and defect assessment and this brings them within the scope of acquainted Pipeline Integrity Management systems. Furthermore, the advance in sensor technology, software algorithms and pattern recognition techniques addresses defects in pipelines at the same level as corrosion features in welded pipe.



Pigtek deliver heavy-duty cleaning pigs

The first quarter of 2016 saw **Pigtek Ltd** design and deliver a fleet of 30" enhanced cleaning pigs. The heavy-duty cleaning tools were designed for use in a crude oil export pipeline located in Central Africa, consisting of four sections and extending to over 1,000km. The scope of supply comprised of the following;

- Single module magnetic cleaning pigs with pencil type brushes
- Dual module magnetic cleaning pigs with pencil type brushes / coupled to an HDR (Hard Deposit Removal) pin pig
- Spare components

The pipeline is known to contain dents, full bore tees, check valves and accumulations of wax, all of which were addressed by the Pigtek design team. Pigs were required for wax control, removal of water to prevent corrosion and to remove any bacterial colonies. The dual module pigs were required to plough up hard wax and loosen it for removal from the pipeline using the single module aggressive pigs as "bulldozers".

Transmitter brackets and magnetic spacer discs were fitted to all pigs to allow for pig location and for activating pig signallers. Brackets to mount data loggers were also incorporated into the single module pigs.

The magnetic cleaning pig is based on a bi-directional pig design and is fitted with a combination of polyurethane guide and seal discs. High power magnetic packages are also fitted to the central pig body for recovery of any ferrous debris. The packages provide a very strong magnetic field over a large surface area to ensure efficient debris pick-up and hold capabilities. Carbon steel pencil type brushes were also fitted to the central pig body and rear of the pig to provide additional cleaning.

The Pigtek dual module HDR pin pig is designed for cleaning pipelines that contain hard wax and/or scale. The pig incorporates steel pins having tungsten carbide tips, which are profiled for cutting into hard pipeline debris. The pins are fitted into heavy-duty carrier cups mounted on the trailing pig. The arrangement of pins in each cup is offset to provide 360 degree cover to the internal pipewall and the aggressiveness of the HDR pin pig can be controlled by altering the number of pins fitted to each cup.



Pigtek's heavy duty cleaning pigs

Jee Ltd awarded North Sea Tullow Oil decommissioning contract

Tullow Oil has awarded a contract to **Jee Ltd** to investigate the most appropriate options for decommissioning their Thames area assets. Awarded in February 2016, the contract relates to the decommissioning of the Horne, Wren, Wissey, Orwell and Thurne fields in the Southern North Sea. In order to decommission these assets, Tullow has submitted decommissioning programmes to the Department of Energy and Climate Change which have been approved, along with a joint environmental impact assessment with **Perenco** (co-operators of the Thames field).

Tullow asked Jee to review the approach specified in their decommissioning programmes for these assets, and redefine the most appropriate decommissioning options for the subsea sections. The study will assess what infrastructure can be left in situ. and where removal is deemed necessary, Jee will look for process efficiency to reduce associated costs. Jee's assessment will include decommissioning options for the associated components such as mattresses and grout bags.

Graham Wilson, Head of Late Life at Jee, commented "Leaving subsea infrastructure in situ, also referred to as derogation, can be the best option from a safety, environmental and economical perspective provided no increased risk to other users of the sea."





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Pathfinder bore in unpiggable pipelines

Pipeline Innovation Ltd's (PIL) Pathfinder foam caliper tool has once again demonstrated its unique ability to provide high quality bore measurement data whilst operating in some of the most challenging pipelines. The tool not only managed to get through a pipeline that would have seen a standard gauging pig become stuck but it also collected valuable data that allowed a crucial decision be made about the pipeline.

The North Sea pipeline consists of two 8" production flowlines connected at a subsea manifold to create a pigging loop. The flowlines, which were constructed in 1996, were due for inspection but had never been pigged. Production wells feed into the flowlines at a number of tie-in points. During decommissioning of one of these wells, barium sulphate hard scale deposits were identified causing restrictions in excess of 20%.



Barium sulphate hard scale deposits

It was unclear whether these deposits were local to the well or whether they carried over into the flowlines 60m downstream. It was also unknown whether any of the other wells feeding into the flowlines were producing deposits.

As the flowlines had never been pigged and there was the possibility of unknown quantities of scale deposits in the line, there was a concern that using hard bodied pigs to clean and gauge the line might result in a stuck pig. To mitigate the risks of pigging, PIL were approached regarding use of the Pathfinder foam caliper pig for proving the bores and estimating the extent and distribution of scale deposits prior to the use of hard bodied pigs for cleaning and inspection.

Two 8" Pathfinder pigs were produced by PIL and mobilised to the platform in the summer of 2015. The first Pathfinder pig was launched and took 15 hours to run through the loop. The pig was recovered in a good condition without any damage to the pig body. The data file was offloaded from the pig and checked to ensure that good quality data had been obtained before loading and launching the second Pathfinder. The second tool was launched, again taking approximately 15 hours to complete the loop and return to the platform. This pig was also received undamaged and in good condition and it was confirmed that a full set of good quality data had been obtained.

The caliper data sets from the Pathfinder pigs were found to be in agreement with each other and also with the pipe bores listed in the pipeline records.

At the suspected problem tie-in, flowline internal bores were found to gradually reduce from 184mm to 141mm over a distance of around 100m. At the tie-in, the minimum diameter (147mm) was in the vertical direction and the maximum diameter (155mm) was across the horizontal direction, suggesting that the thickness of deposits was greatest in the bottom quadrant of the pipe. Clear feature indications and a high data correlation with the pipebook allowed accurate distance and positional measurements to be made.

The information provided by the Pathfinder data was used by the client to drive a critical decision to replace a 60m length of the most heavily affected section of the line rather than risk attempting to remove the deposits with highly aggressive cleaning pigs. The data allowed the client to provide an accurate topsides internal bore diameter map to the ILI vendor, allowing them sufficient time to ensure an effective bore kit solution be implemented on their tool.

The Pathfinder has again demonstrated its ability to provide a low risk bore proving solution for a pipeline with multiple high risk factors. Without Pathfinder data, timely solutions could not have been implemented on this project and the ILI inspection would have likely been deferred long term.

Call for papers

PPSA Pigging Seminar and Exhibition

16th November 2016, Aberdeen, UK Contact: ppsa@ppsa-online.com



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New accurate NDT device for measuring mechanical properties during integrity digs

Nondestructive testing (NDT) on the exterior surface of in-service pipes is an opportunity for pipeline operators to augment their material databases, complementing data gathered via in-line inspection. Thousands of integrity digs are performed each year, but there is no consensus on how to fulfill the pipeline mechanical data requirements proposed by regulators.

Massachusetts Materials Technologies LLC

(MMT) has developed the Hardness Strength and Ductility (HSD) Tester, a novel, portable and nondestructive testing apparatus for directly measuring the mechanical properties of pipelines during integrity digs. The HSD Tester attaches to the exterior of a pipeline to perform a frictional sliding test, where a hard stylus is pressed into the sample material and slides along the surface to form a superficial groove. As the stylus ploughs through the material, it acts like a boat moving through water to create a wake on the surface. The size and shape of this wake profile (shown in blue in the figure below) is measured simultaneously as a signature of material properties.



Schematic of frictional sliding process and resulting feature

The relationship between the profiles obtained and mechanical properties obtained through tensile tests was initially validated academically using a single stylus, but has since been expanded for even more accuracy to include multiple styluses of different geometries that contact the surface simultaneously. They induce different amounts of strain to correlate with specific points on the stress strain curve.



The HSD Tester includes self-guiding to maintain the alignment of the stylus with the curved surface of a pipeline. It is both fast and accurate. MMT's testing procedures are being validated using a large range of materials relevant to existing steel pipelines.



HSD Tester (patents pending)

For Electric Resistance Welded pipe seams, the HSD Tester provides the ability to differentiate in the field between Low Frequency and High Frequency processes, as well as determining if the seams were normalized after welding. This ability is based on unmatched resolution between data points, allowing the HSD Tester to map rapidly the hardness evolution through a welded joint. The challenge of steel grade determination and seam characteristics can be resolved using a portable NDT instrument that probes external surfaces for detailed and accurate determination of material properties.



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Massachusetts Materials Technologies LLC

Dedicated to accuracy in pipeline material data.



Flexible pipe wire monitoring with MEC-FITTM technique

Flexible pipe sections stacked in the masts of the turret drag chain on the FPSOs are often subjected to external tensile armour wire disorganisation. Gamma radiation with images being captured on a film has been the traditional method of inspecting these flexible pipes and although this technique is widely used throughout the industry, it poses several issues.

Radiography could not be performed in the direction of the FPSO's nucleonic detectors as this would trip the vessel's High-Integrity Pressure Protection System, causing an unplanned production outage. The entire turret area has to be shut off to personnel during the inspection as radiography poses a significant danger to health and this prevents routine operations from taking place in the vicinity. In the case of a North Sea operator, radiography could only achieve around 50% of the required work despite the inspection being performed for over nine months of the year.

Innospection Ltd was requested by the operator to investigate a better way of inspecting the 6" and 10" flexible pipes on the FPSO's turret with the aim to identify, monitor and measure the increasing wire gaps of the flexible pipes.

The electromagnetic MEC-FITTM technique developed by Innospection has been used for the inspection of flexible risers and pipes for the detection of cracks, pitting and general corrosion in the single and multiple wires. As the inspection requirement differed from the intended inspection capability of the MEC-FITTM technique, the technique was redeveloped to enable the detection of the signals from the surface and its repeatability in determining the individual wire gaps of the flexible pipes.

Another inspection challenge was the tight space of 150mm gaps between the flexible pipes where the inspection tool had to fit. As a result the flat MEC-P7 Scanner, a small bespoke tool having a customised high resolution encoded drive for precise definition of the edges and distance to the neighbouring pipe, was designed and developed.

Both the technique and scanner were successfully tested and validated onshore on an old section of a flexible hose with intentional damages prior to the offshore deployment.

All the 6" flexible hoses that make up 40% of the turret system were scanned in just two weeks. In addition to better coverage whilst maintaining image quality, the MEC technique has eradicated the radiation risk posed to personnel. Just two fortnightly trips are now required instead of multiple trips to complete the required inspection which results in substantial cost savings.

Jee Ltd hosts decommissioning webinar

Jee Ltd hosted a free webinar drawing on its offshore decommissioning expertise on 13 April 2016. Available to a global audience, the webinar -'Innovation and efficiency in decommissioning' - was presented by Head of Late Life, Graham Wilson, and discussed how decommissioning can be done differently to realise cost savings and environmental and safety benefits.

Graham Wilson commented "The growing decommissioning activity in the North Sea is forecast to cost £47 billion. With the government's drive to reduce this cost by 40%, there is an inherent need to challenge the way that decommissioning has been performed to date."

Mr Wilson continued: "The intent of many recent decommissioning projects has been to remove all subsea components to leave a clear seabed. However, is this really the most suitable solution from an environmental, cost and safety perspective? In this webinar, we discuss the arguments for and against derogation cases."

This webinar is ideal for anyone involved in the decommissioning of offshore oil and gas assets and infrastructure and is part of an on-going series being presented by Jee, in-line with the company's ongoing commitment to continuous development and knowledge sharing. To access the free on-demand recording of the webinar, please visit <u>www.jee.co.uk/knowledge</u>



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NDT Global raises the bar for pipeline corrosion inspection

NDT Global is now offering its high resolution pinhole and pitting (UMp) metal loss inspection service as standard in all markets globally. Its complete ultrasonic corrosion inspection tool fleet has been upgraded to UMp. The UMp service reliably detects defects and sizes as small as 5 mm (0.2 inch) which represents a two-fold improvement in the minimum sizing threshold, from the previous entry level ultrasonic service of 10 mm (0.4 inch). This higher accuracy is provided at a 90% certainty to ensure accurate input to integrity models and reduce the costs to operators.

Many inline inspection providers still offer corrosion inspections without the resolution required to detect and size pinhole defects, with some ultrasonic services only reliably detecting features greater than 10 mm (0.4 inch) and sizing features greater than 20 mm (0.8 inch). However, operators have identified pinhole and especially embedded pinhole defects as a significant risk factor in their integrity management programs. For example, inspection of general corrosion fields with embedded pinholes needs this higher resolution to better identify and size all features in the corrosion area. Higher resolution inspection of features identifies the true deepest point of a pinhole morphology within a larger area of corrosion with an overall shallower depth.

... and NDT Global opens new offices

NDT Global has opened two new offices in Aberdeen, Scotland, and Leduc, Canada. They have been steadily growing with significant investments in technology development and are already successfully operating from other bases in Germany, Canada, Ireland, Malaysia, Mexico, Russia, Spain, UAE and USA.

The new office in Aberdeen, is ideally located in the center of the city, close to numerous North Sea operators, ensuring local and tailored support to the oil capital of Europe. The new Canadian facility located in Leduc, is a fully equipped 22,000 sq. ft. (2,000 sq. m.) warehouse offering optimized shipping and receiving facilities which enables a safer working environment as well as tool testing capabilities to further improve first run success. Additionally, regular training workshops for customers can be comfortably held in the extended training room facilities.

Pressurised pipeline isolation facilitates save ESDV replacement in New Zealand

STATS Group were contracted by OSD Pty Limited to provide double block and bleed isolation of a 12" gas pipeline at an operating pressure of 72 barG. This leak tight fully monitored isolation allowed the safe replacement of an ESD valve at the production station in New Zealand.

In order to undertake this operation safely and efficiently, STATS proposed the use of a remotely operated Tecno PlugTM. Conventional repairs of this type would typically require the pipeline to be hydrocarbon free by flaring the gas and nitrogen purging the entire length of the pipeline to enable a safe intervention. This would have added operational and procedural requirements which would have significant time, environmental and cost implications. STATS' piggable isolation tools are non-invasive and have advantages over traditional hot tap and line stop technology as they require no welding or cutting into live lines and leave no residual fittings or holes in the pipeline.

The Tecno PlugTM, which was configured in a four module arrangement, was successfully deployed and pigged to the set location with MEG. It was pigged through three ball valves and passed the production tee to the set location in the 5D bend where it was set in position using through-wall communication.

The Tecno Plug[™] was hydraulically set to activate the locks and dual seals. The seals were then tested with full pipeline pressure in the correct direction to confirm leak-tight isolation and allow the pipeline to be bled down to ambient from the platform launcher to the rear of the Tecno Plug[™]. The annulus between the Tecno Plug[™] seals was then vented to ambient to create a zero-energy zone. This was subjected to a 24 hour isolation stability hold period.

With the isolation in place and double block and bleed isolation verified the valve replacement was safely conducted. The Tecno PlugTM was monitored and remained stable for the full seven day isolation period. A reinstatement leak-test was conducted against the new valve before equalising the pipeline pressure and unsetting the Tecno Plug. It was then pigged back to the launcher for demobilisation.



Trans Asia Pipeline Services completes major project in Latin America

Trans Asia Pipeline & Specialty Services continued its geographical expansion with completion of a maiden project in Latin America. The project located 20 km south of San Sebastian Bay, Tierra del Fuego is the southernmost project in the world. With an estimated reserve of approx. 25 billion cubic meters of natural gas and condensates, the development of this field is very important milestone in the region. A major oil producer has already started production with capacity of 10 million cubic meters of gas a day (70000 barrels of oil equivalent per day boe/d).

The project consisted of a wellhead platform in 50m water depth, tied back via a 77km 24" offshore pipeline led to onshore treatment facility located at Rio Cullen. Trans Asia's scope of work involved flooding, cleaning, gauging, hydrostatic testing and final leak testing for 24" production and 4" piggy back pipelines.

A technically complex offshore project, it posed many challenges. In the first place it was a technically challenging operation on the other side of globe for Trans Asia demanding participation of a multidisciplinary team located all across the world at Argentina, Singapore, UAE and the UK. In the second place the oilfield is located in an area lacking complete infrastructure where it was necessary to move heavy logistics equipment. Finally, throughout the execution of the project the weather conditions were adverse with temperatures reaching -20 deg C and daylight was available for only a few hours per day.

Trans Asia utilized its strategic location of UAE to mobilize the project resources while the project management was from Singapore.

"Successful and safe execution of this project on literally the other side of the world emphasises the trust our customers have in our capabilities and our motto of Experience Excellence. This is an important milestone for Trans Asia and we will continue to expand geographically accepting and overcoming challenges" said Mr. Sachin Sanghai – CEO, Trans Asia Group.



Trans Asia completes major project in Latin America

1 pipeline, 605 cracks and crack-like features and PHMSA compliance

As technology advances and regulations expand, pipeline operators change the way they manage line integrity, which necessarily includes updating their integrity management programs (IMP). When a pipeline operator creates or updates an IMP, it provides detailed procedures for monitoring, maintaining, and repairing pipelines to help avoid failure and mitigate future repairs. These safety precautions not only serve to protect the environment and personnel, but prove to regulatory bodies, such as the USA **Pipeline and Hazardous Materials Safety Administration** (PHMSA), that the pipeline can operate safely and under compliance.

A case study, titled Seam Assessment and Regulatory Compliance: Multiple Datasets + EMAT, illustrates a scenario in which an operator must choose new inline inspection (ILI) technologies for future seam assessments, and create a new IMP to address the multitude of integrity threats detected by advanced ILI tools. The specific scenario outlined in the case study took place in the USA, with PHMSA as the regulatory body, but the resulting comparison of ILI technologies can benefit pipeline operators in any country. In 2015, a segment of low-frequency electric resistance welded pipe segment ruptured in several places, leaking over 5,000 gallons of liquid propane. PHMSA mandated that the operator could not run the line at Maximum Operating Pressure (MOP) until they surveyed the extent of the damage and brought the pipeline back into compliance. To return the line to MOP, the operator needed to find the hook cracks and lack of fusion in the long seam that caused the ruptures, then repair the defects according to the IMP. To assess the damage, the operator chose to run a seam assessment tool.

In addition to the full seam assessment, the operator needed a comprehensive method for identifying defects and prioritizing repairs in the future. The operator decided to run four different ILI technologies, from multiple service providers, on a section of line with the goal of finding one tool or combination of tools for future evaluations. The final reports revealed an enormous compilation of data detailing 605 crack, crack-like, and possible crack-like features.

The case study authored by **T.D. Williamson** outlines how the pipeline operator revised its IMP to accommodate the amount of data gathered with advanced ILI technology. It also details the results of the operator's comparison of four ILI technologies: SpirALL® electromagnetic acoustic transducer (EMAT) and SpirAll Magnetic Flux Leakage (SMFL), ultrasonic crack detection (UTCD), and circumferential magnetic flux leakage (CMFL). The study discusses the impact of using each technology, as well as the operator's plan for bringing its pipeline into compliance. Download the case study at www.TDW-SeamAssessment.com.

3X ENGINEERING reinforces subsea line

In February 2016 **3X ENGINEERING** and its local distributor **CPS** reinforced a damaged subsea 24 inch pipe section over 1.6m length, due to a dent defect situated at a depth of 4m depth (7.4 % dented depth). The pipeline was in Colombia.

Scope of work

- Following Finite Elements Analysis, 10 composite layers of REINFORCEKiT 4D SUBSEA (R4D-S) product were applied to perform the reinforcement.
- Underwater, several preliminary operations (surface cleaning to get a suitable free span, removal of concrete and existing coating, marking of the surface to be wrapped) have been performed before the essential step of surface preparation (sandblasting) to get a good surface roughness (60micron surface profile).
- 3X wrapping reinforcement has been performed following several stages :
- 1/ Primer (P3X32) application on the defect, using a dispensing gun, to provide a good adhesion of the composite materials.
- 2/ Two rigid composite plates recovered with F3XSS filler positioned over the dent and strongly fixed with ratchet belts during curing time of 2.5 hours.
- 3/ Second P3X32 application performed on the whole pipe surface to be repaired before wrapping.
- 4/ Kevlar® tape pre-impregnated with R3X1050-S resin (using special 3X device called BOBIPREG) wrapped around the pipe. Ten layers were necessary to cover the dent (i.e. about 5 passes of 50% overlap).

Finally, a neoprene soft cover has been applied to protect the repair from shells and other sea elements.

After several subsea repairs conducted recently in Viet-Nam, 3X ENGINEERING confirms its know-how in pipeline maintenance in underwater environment. A special thanks to **ECOPETROL** representatives and CPS team for their precious help to complete this project successfully within one day and in the best conditions.

A.Hak's new 3 inch ultrasound Piglet®

A.Hak Industrial Services has recently launched its new 3" pipeline and furnace inspection systems, available for projects worldwide. This is part of a new range of faster tools with XYZ mapping possibilities.

The first pilot projects are already executed successfully. 'Which was fully as expected since our flexible design of our tools guarantees a smooth bi-directional inspection in every pipeline configuration', states Mr. Edwin Rosier, Sales Manager Inspection Services.

The new range of fast Ultrasound Inspection tools is an addition to the well proven High Resolution Piglet® tools which have already been renown for years and are available for diameter ranges between 4" and 46".

All A.Hak Industrial Services' tools are free swimming inspection pigs which can be used for all kinds of piggable and 'non-piggable' pipelines such as lines with mitered or back-to-back bends with radii (less than) 1.5D. Edwin Rosier adds: 'Even unbarred tees are not a problem for our intelligent tools'.

Due to the real time monitoring of the inspection data and the possibility of A.Hak Industrial Services

executing its own cleaning works, a successful data collection is mostly guaranteed.

'On request we can report pipeline inspections with ultra high resolution and even report within 24 hours for furnace applications'.



A.Hak's new 3 inch ultrasound Piglet®



Ultrasonic In-Line Inspection Services



Obtain precise, quantitative data about cracking in your pipeline.

Learn more >