



February 2011

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Pigging Industry News

the newsletter of the Pigging Products & Services Association

THE PRESIDENT'S LETTER

by Peter Fretwell, Inpipe Products Ltd

In 2010 a number of things happened within the PPSA. Gill Hornby retired as Executive Secretary and was succeeded by Diane Cordell. Diane has taken up the baton and I'm sure you will agree is doing a sterling job.

Sadly during the year we lost our founder Jim Cordell but he would be pleased to know that PPSA is still going onwards and upwards. Jim I'm sure will have joined the big Pipeliners Association in the sky and will be entertaining them with his stories and jokes.

On the 17th November 2010 we held the annual Pipeline Pigging Seminar at the Marcliffe Hotel in Aberdeen. Eight papers were presented covering a wide range of subjects and I would like to thank the speakers personally for making the day so very interesting. As many of us are all too aware it takes a lot of time to write a paper and then put the presentation together. So thank you everybody for your hard work.

There was a change in format this year because at the end of the papers we had a Question and Answers Forum. We were a little unsure how this would be received. Questions could be submitted to the panel anonymously in advance. On the morning of the seminar we only had two questions submitted but we needn't have worried pipeliners being pipeliners made it a great success with additional questions and banter and in the end we had to stop because we literally ran out of time. I had the distinct feeling it could have gone on all evening.

A big thank you must go to Diane for organising the event and especially to

Gill for her advice on preparing for the event and help on the day. Feedback from the event shows that over 95% of delegates thought the day was useful and over 90% said they would recommend it to others. If you can join us next year for the seminar the date is 16th November 2011.

The association's AGM will be held on Tuesday 15th February at the Marriott Westchase Hotel in Houston, Texas, prior to the PPIM pigging conference. Before that happens there is a little matter of the golf day on Monday 14th which over the years has grown into a very popular event. Members invite clients and a good time is had by everyone. Our thanks must go to Gerri Ayers for organising the day and making it such a huge success. This year I hope to be there but as I don't play golf I'll be waiting at the 19th hole for you all to come back in... no doubt with a glass in my hand!!! The golf tournament takes place at the Black Horse Golf Club, Houston. All are welcome to make up teams and to sponsor the event. To find out more, please visit our web-site www.ppsa-online.com and follow the PPSA Golf tournament link.

It is pleasing to see that membership of the PPSA continues to grow. For the first time our membership has reached over 100. As this newsletter goes to print we have just welcomed our 103rd member. We are also delighted to have our first member from South America.

I look forward to seeing you in Houston. ●

Inline Services' success with new SCP Speed Control Pig

Inline Services Inc (Tomball, Texas) completed the successful pigging of a 170 mile, 42" CP Pipeline with their new SCP Speed Control Pig. The pig is designed to do routine maintenance pigging on high velocity, regulated pipelines which normally would require a large amount of gas volume reduction to slow pig velocities to safe, acceptable speeds. The SCP eliminates the necessity to make costly delivery cut backs to clients during required cleaning pig runs.

The SCP's design allows for the

controlled bypass of large gas volumes that will reduce the pig's velocity independent of the pipeline's product velocity. The gas that is bypassed can also enhance pipe cleaning of materials such as black powder by increasing the ability to keep debris suspended far in front of the pig.



42" Speed Control Pig being launched in high velocity gas pipeline

P2D Ltd (Aberdeen, Scotland) designed and built the onboard electronics for the tool which included their P.E.T. data logger.

Inline Services and P2D have also completed an agreement to offer P2D's data logger and pipeline profiling services in North/South America. ●

Innospection develops Flexible Riser Inspection Tool (MEC-FIT)

To meet market demands for general riser and flexible riser inspections operated from offshore rigs, **Innospection Ltd** has developed MEC-FIT, a state-of-the-art Flexible Riser Inspection Tool using a patented NDT electromagnetic technique with deployment onto the pipes by a Remote Operated Vehicle.

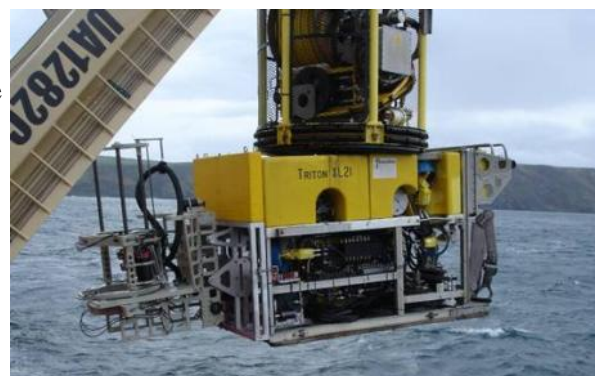
Magnetic field lines are induced into the tensile armoured layers towards the zeta wire of the flexible risers. Corrosion and cracking in the metallic layers lead to field line

changes which are picked up by the sensors, enabling analysis of the damage versus the calibration.

Some key capabilities of MEC-FIT are:

- Fast external scanning
- Good penetration into the tensile armoured layers, depending on the configuration, towards the Zeta wire
- Detection sensitivity for localised defect like cracks and corrosions in a single wire or within an area
- Analysis of material property change (fatigue)

- Ability to inspect a specific layer of the flexible riser with the variation of the tool settings
- Provision of a visual overview of the Polyethylene layer
- No couplant is required i.e. no annulus flooding. ●



Innospection's Flexible Riser Inspection Tool



PIPELINE PIGGING AND MAINTENANCE EQUIPMENT

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ROSEN's Ultrasonic Crack Detection in Demanding Pipeline Environments

Ultrasonic crack-detection represents a reliable and recognized inspection technology for the detection of probably the most severe feature class in pipelines of all diameters. In contrast to laboratory conditions, the pipeline environment generates a complex combination of circumstances that influence the performance of the applied measurement system and pigging technology. In particular cases these can be as significant as increased temperature levels above 50°C, high pressures exceeding 100 bars and medium types (e.g. heavy crude oil) with inherently high damping and temperature dependent damping characteristic. Furthermore, the measurement setup of ultrasonic crack-detection leads to additional dimensional constraints to the general design approach of these in-line inspection (ILI) tools.

The application of electro-magnetic acoustic transducers (EMAT) and ultrasonic crack detection tools represent the principal approaches for detecting cracks. As EMAT ILI tools are not reliant on a liquid coupling medium, both gas and liquid pipelines can be inspected without any limitations. However, due to the complex mechanical construction, this technology is limited to larger diameter pipes. For that reason an ultrasonic crack-detection tool for the detection of circumferential cracks in low diameter pipes with demanding pipeline conditions was developed.

Tools for ultrasonic wall thickness measurement were initially developed for 6" pipelines. This tool design proved excellent data quality during approximately 100 ILI surveys. In addition to the inspection of the pipe body, the long seam and girth weld were evaluated with reasonable data quality. Experience with the ultrasonic wall thickness, led them to conclude that the ultrasonic crack-detection tool would perform even better as the weld is inspected with an axial offset due to the sensor inclination. This approach would allow for higher quality in detecting circumferential flaws close to the girth weld.

For the case of ultrasonic crack detection the angle between pipe wall and incident ultrasonic beam has to be kept as constant as possible. Typical limits are approx. $\pm 1.5^\circ$ in order to ensure that the signal reflected from cracks can be properly detected. If the sensors are attached to the tool body a misalignment between the inclined ultrasonic beam relative to the inside pipe wall is created if the tool remains not within the centre line of the pipe. The tool was built and developed with special consideration of demanding pipeline conditions, such as pressure exceeding 100 bars, medium temperatures of up to 70°C and minimum passage ID of less than 120 mm.

The tool is optimized for detecting circumferential cracks in the influencing region of the girth weld. The tool body design was chosen, i.e. that the ultrasonic crack detection probes are attached to the central tool body, to reduce the influence of the welds on run behaviour. This enables excellent signal quality for crack detection of flaws parallel to and close to the girth weld.

In 2010 the ultrasonic crack detection tool (RoCD-UT) successfully inspected seven heavy wall pipelines with OD 8.0" and a wall thickness of 33 - 37 mm.

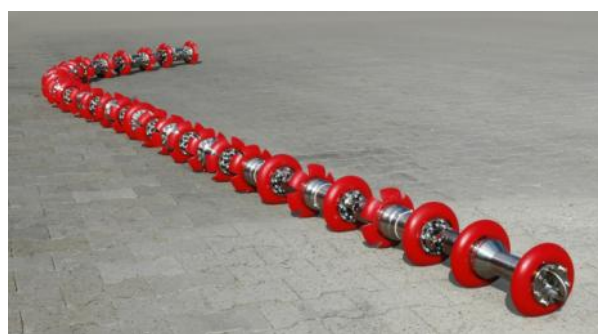


Figure 1: ROSEN ultrasonic crack detection tool RoCD-UT



Figure 2: A crack that was found after dig-up work

INNOVATION.

www.roseninspection.net



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Pre-inspection tools for massive paraffin, long distance pipelines

High paraffin content in crude oil may lead to significant build-up of solid wax on the internal pipe surface. This must be removed before an internal inspection with an intelligent pig. In long distance pipeline sections, the overall volume of solid paraffin may be very substantial and its removal a critical operation. **3P Services** has completed its fleet of specialist tools to cope with this situation—the “snow plough” and the GEO+.

The “snow plough” is a robust mechanical cleaning system with the primary task of scraping solidified paraffin (also scaling or incrustations) from the pipe wall. It is a segmented tool with universal joints consisting of three modules: the pull, plough and transmitter.

It is intended for use within the well proven cleaning concept of running a series of different pigs with gradually increasing toughness or aggressivity. The snow plough tool must be run in a late position. Its steel ploughs, positioned on the middle module and manufactured to the exact wall curvature, take care to remove hard deposits left behind by previously run cleaning devices. The loading of the individual ploughs is adjustable over a wide range. It is recommended to apply a low load at first and increase it gradually from run to run as the cleaning progresses.

The “snow plough” may remove large volumes of paraffin, which will be left behind the tool. In subsequent runs, it will push these more or less solid particles in front and accumulate an increasing volume of paraffin. In long distance pipelines this process may lead to a critical situation which may ultimately create a plug. To avoid this, the snow plough’s pull module (front) is equipped with a large diameter pressure relief valve that opens as soon as a certain pre-set pressure differential is exceeded. This feature enables the snow plough to accumulate a certain volume of paraffin, which (together with the tool’s delta p) causes the valve opening pressure. Once the valve inside the pull module is open, crude oil from behind the tool will substantially flush through it, deviated towards the pipe wall in the front of the plough, diluting the paraffin plug. During this flushing phase the tool will decelerate or, if excessive volumes were collected, even stop. As the paraffin plug is dissolved, the pressure relief valve will close again and the tool recovers its normal (non bypass) speed.

This pull module can be used to pull all sorts of pig trains, be it various cleaning devices or any kind of inspection system. Also the GEO+ system is equipped with an identical pull module.

The transmitter module carries a long range/long life pig transmitter that enables pig tracking or locating of a standing pig. The 18” tool can

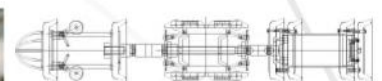
be received with depth of soil coverage up to 5m and has a battery lifetime of 6 weeks.

There are pipelines with critical paraffin problems. During a cleaning campaign, when cleaning tools do not bring out any more paraffin after repeated runs, it is often difficult to know whether the pipeline is clean, or the cleaning tools are just without effect.

To overcome this, 3P Services has introduced the GEO+ inspection system. This includes 3P Services’ well proven multi channel geometric inspection technology (GEO), which is based on mechanical sensors at the pipe wall and electronic measurement of their distance to the tool base. The classic GEO sensor array is combined with DMR (direct magnetic response) technology, adding an indication of the distance between the sensor and the pipe wall. As a result, the GEO+ measures geometric discontinuities and the thickness of any non magnetic layer or coating between mechanical sensor and the steel of the pipe wall. In case of a paraffin layer, the GEO+ delivers a high resolution data base about presence, thickness and distribution (axial and circumferential) of the paraffin. This data enables monitoring the progress of a cleaning campaign. Moreover, in a more complex system, where different crude oil qualities are fed into a main line at different distance locations, the GEO+ data may help to identify local issues and help to optimise inhibition schemes and other anti-paraffin measures. ●



3P Services » Your partner for special pipeline inspection applications and technologies«
www.3P-Services.com



Greene's Energy Group—a total-solution liquid handling provider

Greene's Energy Group has opened a new Water Treatment Services Division to serve the exploration, production, pipeline transportation, storage, refining and industrial market segments.

Greene's Water Treatment Services Division takes a total-solution approach to liquid handling, whether the application is produced water treatment, polishing, well stimulations, acid flowbacks, pipeline maintenance, hydrostatic test dewatering, decommissioning or commissioning. By taking this approach, they offer solutions that meet the specific needs of a project and get the job done. Operational system offerings include pumping, storage, separating, filtering and

discharge of liquids. The new division provides timely and cost-effective solutions for both onshore and offshore applications. Greene's Energy Group, which offers an array of patented technologies, provides products and services for all phases of the industry. With a solid reputation in the oil and gas industry, they provide reliable and innovative solutions. In addition, they have a highly trained team of experienced and knowledgeable professionals.



Pipeline flush and abandonment process equipment is set up in the Gulf of Mexico

3P Services' inspection of CRA and clad pipe

Pipelines made of CRA pipe (Corrosion Resistant Alloy) and clad pipelines can now be inspected using a special high-resolution application of 3P Services' DMR sensor technology (Direct Magnetic Response). Liner wall thickness and in particular a local lift-off of the liner from the internal surface of the carrier pipe can be located and sized accurately. The latter, an apparent thickening of the liner, indicates corrosion between liner and carrier pipe with the oxide kept in place.

Increased liquid natural gas supply to Nigeria

T.D. Williamson SA (TDW), successfully completed a series of operations to increase liquid natural gas supply to Nigeria for the Nigerian Agip Oil Company Ltd (NAOC), a joint venture between Agip and the Nigerian National Petroleum Corporation (NNPC).

In 2009, Saipem Contracting Nigeria Limited awarded TDW a contract to substantially increase much needed gas supply as part of the upgrading of the Obiafu/Obrikom Gas Plant T4/5 Project. To achieve this, TDW connected two production units by carrying out a series of hot tapping and STOPPLE® plugging operations at the Obiafu/Obrikom onshore gas plant, which is located 80 km from Port Harcourt, Nigeria. The gas supply has increased by 312 million standard cubic feet per day.

New dedicated Business Unit for Pipeline Brushes

Rapid growth in demand for pipeline brushes has led to Cottam Brush Ltd setting up a dedicated business unit for the pipeline maintenance industry; Cottam Brush - Pipeline. The vision for the new business unit is "To provide world class brush solutions through partnership and innovation". They intend to achieve this by working closely with key customers and suppliers to create long-term mutually rewarding partnerships.

Cottam Brush Managing Director,

Ben Cottam explains, "We started to work on pipeline brushes over 30 years ago and it's grown to half our business today. The needs of this industry are different to other sectors we're involved in so we decided to offer a dedicated service to the pipeline maintenance industry. We'll be able to react quicker to our customers and we'll really be able to focus on the specific needs of this industry."

The business started restructuring in 2010 and now has a team in place. Developments for Cottam Brush - Pipeline in 2011 will include new products, a new manufacturing line and a new website (due later in the year).

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- ATEX Solutions
- Easy Installation
- Avoid Downtime
- Subsea
- Pipe in Pipe
- Above Ground
- Underground



HPC successful in Offshore Pigging in Indian Ocean

Analytic Pipe's HPC tool belongs to a group of measurement tools used for obtaining geometric data. Produced for offshore pipelines, the tool operates in the same way as a normal caliper tool with the exception of not having to be removed from the pipeline for data analysis purposes. This advantage is the result of the tool's on-board analysis system which gives immediate information on the state of the line.

Oil and gas are increasingly being exploited from remote onshore and equivalent deep-water locations. In order to meet the challenges of inspecting pipelines in these environments, Analytic Pipe GmbH was approached to develop a solution that would not only be safe, but also cost effective for their clients' businesses. In order to satisfy all the requirements for both safe and cost-effective methods of pipeline inspection, specific new technologies for this have needed to be developed.

Halliburton Corporation approached Analytic Pipe to ask

them to develop a tool that would meet specific criteria, including:

- bi-directional
- ability to negotiate dual-diameter pipelines
- ability to withstand pressures up to 400 bar
- measurement accuracy for distance, internal diameter changes, as well as the detection of defects
- remote access for the signal from the accompanying ROV

Once built, the tool was launched in reverse into the test-head and attached to the pipeline on the seabed. It was then pigged through the pipeline to the receiver. A remote-operated vehicle (ROV) was launched and positioned at the receiver. Following this, data were collected in order to determine if the threshold exceeded a certain percentage value. Once the information was verified, the tool was left in the pipeline for the actual subsequent pressure test.

A major project was run by Analytic Pipe in the Indian Ocean that proved to be highly successful and the procedure was applied successively in 22 pipelines.

Inspection took place at a depth of 800m, at a maximum pressure of 400 bars, without removing the tool from the pipeline. ●

Improved "Detection and Sizing Performance" for MFL inspection tools

Following years of detail improvements on sensor technology and magnetic circuitry as well as significant progress in data analysis software, in January 2010, 3P Services launched a new general MFL tool specification.

The new "Detection and Sizing Performance Specification", as usual in the format as recommended by POF, is valid for all of 3P Services' MFL inspection modules, whether configured as pure MFL or as combined tools. This also includes bi-directional MFL applications.

The Probability of Detection (POD) and sizing accuracy values, taken from numerous pull tests, have significantly improved. In particular, capabilities to detect and size "pinhole" type features, part of the domain of MFL superiority over UT technology, have again increased. ●

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TDW Introduces Quick Access Threaded Closures

T.D. Williamson, Inc. (TDW) recently introduced a line of easy installation, quick access threaded closures. The threaded closures (TDW D-500) are suitable for use on pig traps, filters, strainers, scrubbers, heat exchangers, blowdowns, and many other types of vessels. They operate in fluids such as natural gas, refined products, water and crude oil.

Available in sizes 2- through 14-inch, D-500 threaded closures offer a number of important

advantages. The doors are easily opened and closed with standard tools, requiring no special tools or hammering. The large cross-section O-ring on the barrel collar maintains a positive seal. The closures feature a pressure warning lock to alert the operator to internal pressure prior to opening the door. For added safety, the primary door seal is released before the threads are completely disengaged. The simple design of the closures allows economical production, and TDW maintains a well-stocked inventory for quick delivery.

D-500 Threaded Closures are available in several configurations. Sizes 2- through 8-inch without hinges are standard, as are sizes 10- through 14-inch with horizontal hinges. Horizontal hinges on 4- through 8-inch closures and vertical hinges on 4- through 14-inch closures are available as special orders. ●



D-500 Threaded Closure Horizontal and Vertical Hinge

Record breaking pipeline isolations in 2010

TDW Offshore Services AS (TDW) has carried out a record-breaking number of pipeline isolation operations with its SmartPlug® pipeline pressure isolation technology. By the end of 2010, TDW should have completed at least 30 operations, the highest in company history.

The primary benefit of TDW's SmartPlug pipeline pressure isolation method is that it makes it possible to safely isolate the area targeted for work from hydrocarbons without bleeding down the entire work zone, which is costly and time-consuming.

The company attributes the increase in operations to a number of factors. "What we're seeing is

an increased dedication to safety and appreciation of reduced cost benefits realized by pipeline operators," said Rutger Schouten, Director of Operations and Technology for TDW.

With 175 SmartPlug isolation operations carried out since 2000, the vast majority of operations were carried out for the purpose of replacing topside valves. Most operations took place in the North Sea and Asia Pacific, although several were executed in the Gulf of Mexico and the Mediterranean Sea.

As demand for its pipeline isolation services has escalated, TDW has risen to the challenge by developing large customized SmartPlug tools, as well as systems such as the SmartTrack™ technology that complement its SmartPlug tools for use in highly

complex isolation operations.

The SmartTrack system makes it possible to track pigs, whether they are subsea, topside or inside underground pipelines located onshore. It played a central role in a recent operation in the Mediterranean Sea where an anchor drag caused catastrophic failure when it severed a 26-inch high pressure subsea gas pipeline, resulting in a 14% reduction in a parallel 20-inch subsea high pressure pipeline. TDW worked in cooperation with the pipeline repair contractor, using a combination of its SmartTrack remote tracking and pressure-monitoring system, pipeline recovery tools, and SmartPlug pipeline pressure isolation tools to effectively isolate the affected sections of the pipeline. It was the first time that TDW had been called in to facilitate repair of a pipeline that was completely severed. ●



www.tdwilliamson.com



T.D. Williamson, Inc.
Pipeline Performance™

Case Study—Push-Pull System for Piglet

Following on from November's article about the development of **A Hak Industrial Services'** Push Pull system for Piglet, here is a case study showing the new technology in action.

The push-pull system allows for user-friendly high-performance ultrasonic inspection of branch lines. The modifications made to the original Piglet inspection system involve the combination of the ultrasonic measurement unit, the odometer and all required electronics into a single module and the replacement of the polyurethane discs by a unique patented suspension system for optimal centreline running.

It is suitable for 6" pipelines with a maximum length of 60m and a minimum bend radius of 1.5D. Other system specifications are similar to the original Piglet inspection system, including the inspection velocity of 600-800m per hour.

After extensive testing the push

pull UT inspection system was first introduced during the inspection of a fixed airport hydrant fuelling system. The main loading line from the kerosene depot to final valve chamber consisted of a 300m long section of 8" line, followed by a 70m long 10" section. Along the main loading line, a total of 8 no. 6" branch lines with lengths varying from 4m to 60m ran from the main loading line towards aircraft fuel hydrants. Whilst the main loading line was inspected with the original Piglet® system, the branch lines were inspected with the push-pull UT inspection system.

Prior to the removal of the hydrant valve, the branch line to be inspected was depressurized. Once the hydrant valve was removed, a temporary valve and an extension spool piece were installed for safety and accessibility purposes after which the push-pull tool was pushed to the end of the branch line.

The most challenging branch line configurations had a total length of 60m and required the inspection tool's passage of a 6" S40 1.5D 90°



Push Pull system inspecting an airport hydrant system

bend, a 6" S40 equal tee and another 6" S40 1.5D 90° bend located at respectively 3m, 35m and 40m from the entry point.

The inspections were performed during the day, whereby the airport hydrant fuelling system remained fully operational with the exception of the single branch lines whilst these were inspected in turn.

The inspection of the branch lines was successfully completed in 2 normal working days. The push-pull UT inspection tool performed well and completed the project in good working order.

At the moment 6" and 8" (dual diameter) are available and other diameters are under construction (4"). Patents are pending. ●

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