

Pigging Industry News

the newsletter of the Pigging Products & Services Association



President's Letter

by **Gordon Short**
Weatherford P&SS, UK

THE PAST 12 months have been a very active period for the PPSA. During this time we have seen our membership grow from 71 to 84. It has been particularly pleasing to see this growth reflecting the global nature of our industry.

As with previous years PPSA has run seminars to promote knowledge of our industry and of our member companies. In November 2004 we held a seminar in Aberdeen which proved very successful, attracting some 65 delegates: the theme was 'Emerging issues' with specific emphasis on how PPSA members are working with our clients to provide innovative solutions to operating and maintaining ageing pipeline assets. In addition to PPSA Full members, both BP and Shell (Associate members) presented papers on ageing pipelines from the operator's point of view and how they saw future developments.

In a break with tradition we also ran a seminar in London in December, which attracted some

45 delegates. This event focused on new challenges such as very deepwater and ultra-long distance pipelines.

Other initiatives this year have seen us form our technical advisory committee. This has been set up to allow the association to handle technical general enquires or requests for information which our members would normally be unable to provide. In addition, the PPSA has taken exhibition space at the Pipeline Pigging and Integrity Management conference and exhibition in Houston, in February 2005, with the express aim of promoting PPSA and through this, our member companies.

Our industry continues to change and evolve and as an association the PPSA must change and evolve with it. I believe that we have embarked upon this process in 2004 and will continue to do so in 2005 and beyond. I now hand over the presidency to Bryce Brown of Rosen, and I wish Bryce every success in the year to come. ●

New members

Full

CDRiA Pipeline Services

Ltd, Warsaw, Poland

Macaw Engineering Ltd,

Wallsend, UK

Online Electronics, Aberdeen,

UK (*rejoining after a short absence*)

Associate Member

PipeCare AS, Haugesund,

Norway

Individual Member

Steve Hutcheson, Pipeline

Pigging Technology Ltd,

Chesterfield, UK

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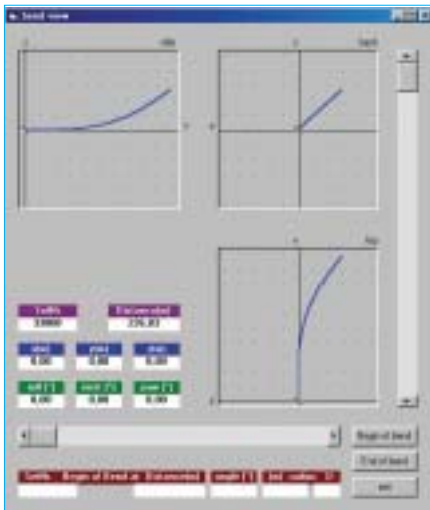
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Industry news

Analytic Pipe's tool "exceeds expectations"

THE company's newly-designed and -proved multi-channel calliper tool exceeded all expectations in a recent project in Saudi Arabia, where the company performed a 145-km baseline survey on a newly constructed pipeline. The tool was able to show indications of 1% of nominal OD. The battery capacity has also been increased, to a maximum of 1600hrs depending on the tool size and requirements.

After detection of a defect, it can be shown in 3-D view, highlighted in red, enabling a real impression of the detected defect to be seen. As can be seen from the accompanying screenshot of the software, the view contains all the important information about the o'clock position, the length, width, depth, and distances from and to the next reference point.



Screenshot of a report from Analytic Pipe's new tool.

PE's news

New chairman

AFTER five years as non-executive chairman of **Pipeline Engineering**, Tom King has retired and has been replaced by Syd Fudge who, until recently, was CEO of **Kaverner's** offshore construction division. Syd brings to PE invaluable experience of manufacturing and service in the offshore industry. This appointment is proving timely as PE Solutions expands its flow assurance consultancy and pigging design business. ●

Flow-assurance services

FLOW assurance is critical in today's oil and gas industry as more multiphase hydrocarbons are produced from deepwater fields and transported through longer delivery systems, and where increased use of multiple flow streams under extreme and changeable environmental conditions is commonplace. To meet these flow-assurance challenges, PE is working with a number of key players in the industry to provide an integrated service including:

- assessment and consultancy services including investigation, design support and solution provision
- remediation services for production systems where hydrates, wax, scale, asphaltenes, and other solid deposits have become an issue



PE's reord-breaking 56-in sphere.

- maintenance and additional support services to improve system availability, performance, and operation

Set up in May, 2004, this service has already undertaken a number of flow-assurance projects and is finding its services in great demand. ●

56-in spheres

PE has broken records again by supplying a number of 56-in diameter inflatable polyurethane spheres for the production cleaning of a client's gas pipelines. It believes the spheres are probably the largest of their type ever manufactured.

The 56-in spheres were manufactured from a three-piece core, which was then suspended in an outer mould, enabling the outer skin to be cast in one piece. PE's proprietary *Omnithane* polyurethane was used to provide low-abrasive and high-tensile characteristics. The main challenge was to build suitable tooling that ensured equal temperature dissipation so that the polyurethane, once poured, would cure at an equal rate and would therefore not be prone to tear propagation, a common

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Supplying: Pigs (solid polyurethane, metal bodied, foam, spheres) . Pig signallers . Closures . Traps . Piggable tees . Isolation plugs . Internal joint testers . Design and consultancy service



Black-powder removal pigs from PE.

problem with many types of sphere on the market.

In addition to the spheres, PE is providing on-site services to train clients' personnel, due to the large weights (2 tonnes each) and sizes involved, to ensure safe and trouble-free operation. ●

Light-weight pigs help remove black powder

WORKING with a major pipeline operator, PE was asked to develop a new generation of pigs for large gas lines which would help remove black powder. Due to the arduous conditions of the dry-gas lines, in conjunction with long runs and large diameters, in this case up to 56in, PE's client found that conventional designs were unsuitable for its operational cleaning requirements, particularly in removing the powder.

The challenge was to reduce the pig weight, while still allowing for all the required features, such as magnets for ferrous debris collection, additional discs for debris removal, and correct centralization along with high-density brushes for fine-powder removal. In addition, the pigs had

to be run in high-production flowrates, and special bypass and jetting facilities were incorporated to control their speed and allow sufficient bypass to run the pigs without any interruption to production.

To reduce the pig weight, new body tube designs and special alloys were used, reducing the weight by up to 50%. To cope with the high abrasive conditions in the dry-gas lines, suspension wheels, mounted on a newly-designed trailing arm, were also incorporated. The new designs also used PE's proven *Hyper Omnithane* polyurethane to minimize the wear on the discs. ●

Inspection of non-piggable pipelines

RROSEN has developed a robotic pipe scanner (RPS) for the inspection of above-ground non-piggable pipelines.

The RPS is designed for 360° coverage inspection of above-ground carbon steel pipelines that are unsuitable for inspection using intelligent pigs. The tool uses the reliable and proven magnetic-flux technology to provide high-quality inspection results. Typical applications for the system include product lines, flowlines, and firewater lines in refineries. The tools are currently being used in the Middle East for a project covering more than 50 pipelines with various diameters.

The equipment for on-site performance consists of three major components. The self-propelled inspection tool installed on the pipeline, the control panel for manual or remote-control operation, and the data evaluation and visualization electronic notebook. The tool can be opened and clamped on the pipeline within a few seconds.



Screenshot from Rosen's on-site 'visualization notebook'.

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Depending on the tool size (available in 6, 8, 10 or 12in), this can be done manually or by use of a crane. An important feature of the RPS is its ability to bypass a variety of installations, like supports: whenever the scanning process pauses at a support, the tool opens and lifts its magnet yokes; afterwards, it lowers and closes the magnet yokes and continues the scanning process. This feature speeds-up the inspection process, allowing fast and reliable inspection of a large number of pipelines.

The on-site visualization notebook provides a real-time view on the inspection results, using *ROSOF*T data-management software that comes with the RPS package. The software, delivered to the client with the final report, offers complete access to all database results. Each defect can be viewed, evaluated in detail, and easily printed for field use. Feature assessment can be carried out in accordance with various codes, for instance POF, RSTRENG, and API 579. ●

Greenstream pipeline success for Weatherford

WEATHERFORD'S temporary air-compression station (TACS) installed in Sicily, Italy, for wet buckle contingency during pipe-lay of the 32-in diameter *Greenstream* Libya-Italy gas export pipeline has now successfully completed dewatering and drying operations. The 518km Trans-Mediterranean pipeline Libya Gas Transmission System (LGTS), or *Greenstream*, runs from Melitah, Libya, to Gela, Sicily in water depths exceeding 1100m, and was constructed by **Saipem SpA**, using the *Castoro Sei*.

Weatherford's TACS boasts the largest fleet of purpose-built air compression equipment in the world. The majority of the 58 compressors are built with the 'combination' design incorporating

a rotary-screw and reciprocating-booster compressor in a single 20-ft skid frame. The fully stand-alone TACS includes four feed compressors, 16 air dryers capable of dew points in excess of -60°C, eight high-pressure boosters, 18 coalescing and carbon-bed oil-removal filters, flow meters, centralized remote monitoring system, fuel-pumping and -distribution system, and all support facilities (electrical generation, lighting, etc.).

The TACS retains 53,000HP and produces in excess of 1800m³/min (63,600scfm) of compressed air at pressures up to 250bar (3625psi). It also incorporates the facility for high-pressure nitrogen generation with the addition of Weatherford's membrane units.

The station was mobilized directly to Sicily from Russia, where it was successfully utilized to provide similar services to Saipem on the *Bluestream* development project in the Black Sea. ●

Multi-channel caliper pigging

JANUARY saw the launch of **Weatherford's** *MultiCal™360* combined multi-channel caliper and *SAAM* smart utility pig, that has been introduced to provide new levels of inspection and defect-orientation detection (the o'clock position). A large number of caliper arms and new data-sampling techniques enable the definition of the size, profile, location, and o'clock position of pipeline defects down to 2% of diameter. Designed to meet new pipeline-integrity management regulations in the USA, the tool will be targeted initially at North America, with the rest of the world following shortly afterwards.

Suitable for use in hydrocarbon



Weatherford's MultiCal™360 combined multi-channel caliper and SAAM smart utility pig.

lines from 6in to 60in, the fleet of tools will be based in Houston. ●

Lamma Extension project awarded to Weatherford

IN ADDITION to contracts recently awarded for pipeline precommissioning work on Bayu Undan, Sakhalin, SCP (South Caucasus Pipeline), and the BTC pipeline, **Weatherford P&SS** has confirmed that it has also been awarded precommissioning work on the *Lamma Extension* project in Hong Kong. This project involves the installation of a submarine gas-transmission pipeline to transport gas from the existing Guangdong LNG plant at Cheng Tou Jiao, in Shenshen, to the Lamma power station on Lamma Island, Hong Kong.

The work scope awarded by EPIC contractor **Saipem Asia Sdn Bhd** includes filling, cleaning, testing, gauging, dewatering, and drying 92km of 20-in diameter gas pipeline in 30-35m water depth. Work is scheduled to commence in June, and to continue into 2006, and will be coordinated from Weatherford's base in Singapore. ●

Nigerian contracts

BJ Services Co Nigeria Ltd has been awarded two contracts by **Shell Petroleum**

Development Co of Nigeria Ltd (SPDC) for pipeline cleaning, stuck pig recovery, descaling, and auxiliary pumping support services. The work will support SPDC's Eastern Division operations in the land and swamp areas of the Niger Delta region. The two-year contracts include a one-year option to renew, and are being supported by BJ PPS' personnel and equipment at the company's permanent bases located in Port Harcourt Nigeria. ●

ISO 14001 award

BJ Services' marine base in Great Yarmouth, UK, has been awarded ISO 14001, an environmental-management system, following a compliance certification audit by **Det Norske Veritas** (DNV). Following this, the company must continually update practices that may adversely affect the environment because the nature of environmental management is constantly changing. As a result, ISO 14001 involves setting individual company objectives for improvement, and requires continual monitoring of practices to retain the certification status. ●

Pipe-in-pipe annulus integrity service

A NEW service to determine whether the annulus between the inner and outer pipe of a pipe-in-pipe system is dry or flooded has recently been developed and proven by **Tracerco** on a pipeline 1000m subsea offshore West Africa. The technique employs two different non-intrusive scanning techniques operated by ROV to

give quick and immediate validation of annulus integrity.

Annulus integrity is essential within a pipe-in-pipe system for general integrity of the whole pipeline system, as well as confirmation of continued thermal protection and deposit lay-down prevention. The service was developed at the request of a major oil and gas operator after concerns that one of their installed pipelines had been breached and seawater had ingressed into the annulus. The results from this first project were excellent with unequivocal results proving that the annulus had not been compromised and was still dry.

The service is available for any diameter and wall thickness of the inner and outer pipes, and is of use where there are concerns about external damage or corrosion leading to the ingress of seawater, or where internal corrosion can result in the ingress of product into the annulus. The service is currently under trial with the intention of using it as a regular health check for annulus integrity. ●

Simian and Siena gasfield projects

CONTINUING its successful multiple services precommissioning and commissioning of the **British Gas Rosetta** and **Burullus** projects, **Sahara Petroleum Services Co** (Sapesco) has commenced multiple-services operations on the precommissioning and commissioning activities for the **Simian** and **Sienna** gasfield projects at Idku in the Nile Delta,

Egypt. The project work is split into three main phases: first, a shutdown of the main **Burullus** facilities; second the start-up activities for **Simian**, and thirdly the start-up activities for **Sienna**. Commissioning activities for a separate phase for **Sapphire** will commence later in the year.

Additionally, Sapesco has completed the precommissioning and commissioning activities for **United Gas Derivatives Co** for the LPG process systems at Port Faoud and Damietta in Egypt, where LPG production has now commenced. Sapesco successfully dried the pipeline to -40°C dewpoint, and now expects to complete the connecting 52km 10-in pipeline commissioning with product available later this month. This is the first major export pipeline for liquefied gas products in Egypt. ●

Constant demand for pig wheels

AS a major supplier of wheel assemblies in both general industrial and pipeline applications, **FTL** has established a reputation for the design, manufacture, and supply of high-quality and reliable assemblies. To ensure this reputation is upheld, a constant material development and design programme is maintained.

There are increasing demands for wheel assemblies to accept ever-greater load and speed combinations; this is often without allowing for increasing the size of wheel or installation envelope. As ever, these increasing functional requirements must not lead to any



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reduction in service life. To accommodate these increasing demands, new wheel assemblies, using the latest bearing technology combined with efficient and effective sealing designs, are being developed. In order to validate the designs for use in the field, and to provide the degree of assurance customers require, all the wheel assemblies are fully validated on a range of in-house test rigs. The test rigs are able to replicate extreme load and speed conditions combined with varying degrees of impact resistance.

The range and number of *Varipig* systems in use continues to grow, and FTL has begun a comprehensive test programme for the latest multi-diameter capable *Varipig* system. The new build pig has been designed to accommodate large diameter changes in operation within a complex multi-diameter pipeline system. Among the challenges to successfully pass through the pipeline system is the initial requirement for the *Varipig* to be launched within the small-diameter pipeline, then increase into the larger-diameter pipeline, and then subsequently re-enter a smaller-diameter pipeline section. ●

Safety interlocks for Buzzard

SMITH Flow Control has been awarded the contract to supply safety interlocks for the *Buzzard* field development in the North Sea operated by **EnCana (UK)**. The company will supply approximately 220 interlocks for process pressure protection and for the crude export pig launcher.

Interlocks ensure all valve-handling procedures are carried out in the correct sequence, reducing the chances of serious accidents due to operator error. In addition to valves and pig launchers, interlocks can also be used to protect switches, vessel closures, access guards, tanker-loading systems, and pressure and temperature sensing systems. ●

Just another high-pressure pigging project

LTS Inc has completed two 15,000-psi pigging systems for **ENI Petroleum**, to be installed on **Anadarko's Marco Polo** host platform in the Gulf of Mexico, off the New Orleans coast. LTS already has 16-in 15,000-psi systems, in operation in the GoM, and specializes in high-pressure, high-temperature and deepwater tie-back applications.

Recent orders include three 8-in 10,000-psi systems for **Murphy Oil** and **Walter Oil & Gas** installed on the *Medusa* platform; additional orders have been placed by Anadarko for two 10-in 10,000-psi pigging systems also being installed on *Marco Polo*, as well as two 8-in 10,000-psi systems being supplied to **Dominion E&P** for its *Triton/Goldfinger* tie back. ●

News from T D Williamson

MAGPIE Systems, Inc is introducing a combination MFL and deformation tool, which combines deformation technology with either a standard MFL tool, or MFL with an ID/OD tool. The

company says that a single run can provide all the information needed to assess a pipeline's structural integrity, which saves time and money. The deformation tool is a high-precision tool for locating, sizing, and determining orientation of diameter reductions in pipelines; it can also detect and identify bends and their locations. ●

Pigging training

INPIPE Products is offering comprehensive in-house training on pigging components. Those interested should contact Lucien Piette at the company for details of training dates, etc. ●

Large-bore and high-pressure pig-launcher systems

THE CONSTRUCTION of large-bore export pig launchers on **BP's Holstein** platform off the New Orleans coast has called for the manufacture of 34-in and 28-in closures. These sizes are outside standard ANSI and MSS flange ranges, and posed significant technical challenges, as well as requiring a 20-year design life. The twin-lead screw closure design was supplied by **LTS Inc** and connect the *Cleopatra* and *Cesar* export pipelines to the *Holstein*, *Mad Dog*, and *Atlantis* platforms. With *Thunder Horse*, these fields make up the *Mardi Gras* system, one of BP's largest developments in the world with nearly 2 Bbbl of recoverable oil and the most significant find in the Gulf of Mexico's history.



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Key to the requirements was for the closures to be quick and easy to operate, but their size and weight made manual operation cumbersome and time consuming. Moreover, the barrels are vertical, especially making it difficult to open and control the function of the door, which weighs in excess of 1 ton on the 34-in unit. The solution was to automate the closures enabling local opening and closing with remote sensing from an integrated control panel. Each closure can be opened in approximately 5mins – much less time than the 6-8hrs estimated to assemble and bolt-tension custom-designed flanges. ●

News from RTD

IN 2004 several particularly-challenging projects were undertaken by **RTD PIT Project Services**, in which tailor-made solutions were required to meet clients' requirements. A new 10-km umbilical has been put in service. All drives and controls are intrinsically safe for special application on- or offshore.

Combining two umbilicals can be undertaken: with this combination, the company has the capability to cover pipelines up to 20km in length. The interface between the umbilicals guarantees reliable connection without sacrificing on safety (cable-pulling strength) or signal deterioration.

Extending the travel distance requires more pulling force to pull the umbilical behind the inspection tool. To solve this, two traction modules can be mechanically combined like two locomotives in front of a train.

This combination also allows passage of very steep river crossings up to 30-45°.

A modified traction module has been used in a 36-in offloading pipeline to pass a full-bore horizontal tee and a *Plidco* connector. The double set of wheels provided extra traction and guaranteed passage of such obstacles.

A novel unit has been designed and introduced to provide two different UT inspections simultaneously. This patented design offers 100% surface coverage with two 0° sensors for corrosion detection, but can also perform a ToFD inspection simultaneously for detection and sizing of transverse cracks or weld inspection. This unit is available for pipe diameters of above 10in. ●

On-line wax measurement

IN CRUDE oil pipelines there is a chance of paraffin deposition, which occurs as a more-or-less regular internal coating, the thickness, location, and consistence of which depends on the type of crude and the operating conditions during pipeline transport (temperature, pressure). Such paraffin layers interfere with in-line inspection and – if major volumes of paraffin are sedimented – the available pipe cross section may be reduced substantially so that the pipeline operation is restricted.

3P Services' wax -measuring pig is an in-line inspection tool that delivers multi-channel, highly-detailed, data about where in the

pipeline (axially and circumferentially) wax is deposited, and to what thickness. It is a slim tool, so it can be applied in an early stage of cleaning, measuring significant thickness of paraffin layers. Thus, it supplies a detailed database which can be used to plan an efficient pipeline-cleaning programme, or to correlate with paraffin-sediment modelling. The 'wax' pig may be applied during the cleaning programme to monitor the progress of paraffin displacement.

The major advantage of the wax pig's data is that it allows confirmation of the success of the cleaning programme, and to prove the readiness of the pipeline for inspection. Since its sensors have the best resolution at small thickness (1mm), the degree of cleanliness can be evaluated carefully and precisely.

The wax pig is a special application of the company's well-proven in-line inspection technology; it has all features of a self supporting intelligent pig, including an odometer to record distance, and a clock-position decoder to monitor the pig's rotation, and several hundred kilometres of pipeline can be inspected in one run. To measure the thickness of the paraffin layer, direct-magnetic response sensors are used, incorporated in a segmented pig cup and used to measure the stand-off from the internal steel surface. Other helpful parameters, like delta pressure over the pig, temperature, etc., can be measured with installation of additional sensors. ●



Benefits of joining the Pigging Products & Services Association

Members receive:

- ☆ e-mail notification of technical enquiries and tender invitations received by the PPSA
- ☆ entries in the PPSA's Buyers' Guide and Directory, and on the PPSA's web site
 - ☆ free copies of *An introduction to pipeline pigging*
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To join the PPSA, please fax back the form below.

Annual membership fees:

Full member: £890 plus £50 joining fee
 Associate member: £410 plus £50 joining fee
 Individual member: £140

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Company: _____

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