PIGGING PRODUCTS & SERVICES ASSOCIATION

PO Box 30, Kesgrave, Ipswich
Suffolk, IP5 2WY, UK
Tel: +44 1473 635863
Fax: +44 1473 353597
ppsa@ppsa-online.com
www.ppsa-online.com

November 2014

Pigging Industry News

the newsletter of the Pigging Products & Services Association

THE PRESIDENT'S LETTER

By Steve Mayo, Pipelines 2 Data (P2D) Ltd

Across the pipeline pigging industry, there seems to be a feeling of optimism, as the volume of work appears to be rising, as well as the recognition of the vital importance of our sector's contribution to the wider landscape of worldwide energy provision, particularly in areas where decommissioning is becoming a paramount concern. It's also great to see the technological advancements being made across the sector, with customer focussed solutions paving the way.

This was evident at the recent IPE exposition in Calgary, at which PPSA exhibited. The conference and exhibition had a record number of 6160 attendees and 225 exhibiting companies there, including delegates, exhibitors and other visitors. It was a great opportunity for PPSA to tell people about the Association and the variety of products and services that our members provide. As usual our Buyer's Guide was in great demand.

PPSA also continues to go from strength to strength, with more new members joining us. Please join me in welcoming: Full member KTN AS, and four individual members Euan Gibbons, Frank Mueller, Anupam Sharma and Ron Strathdee. All of our new members bring additional resource and expertise to the great forum with which we are all familiar. I have no doubt that they will also benefit hugely from the flow of information back to their individual organisations. Welcome to the club!

Preparations are heating up for the annual PPSA Seminar in Aberdeen. This year, held on the 19th November, with a fantastic 10 papers to be presented alongside the exhibition. If previous years are anything to go on, this will be a truly excellent opportunity to catch-up with colleagues, make new contacts and get immersed in the latest developments of our craft. We are also looking forward to the pre-seminar evening reception curry night on 18th which will be taking place in the exhibition area.

Another date for your diary is the annual PPSA golf tournament that is taking place in Houston, USA on Monday 9th February 2015. All players are welcome to join us and sponsorship opportunities are available.

This is followed the next day by our Annual General Meeting, that is being held at the Westchase Marriott Hotel, Houston at 3pm. Please contact Diane Cordell for details at ppsa@ppsa-online.com.

NEW Members

Full

KTN AS, Norway

Individual

Euan Gibbons, UK

Frank Mueller, UAE

Anupam Sharma, Saudi Arabia

Ron Strathdee, UK

With our e-training tool under development, our expanding member list and continuing stream of customer enquiries, PPSA remains at the forefront of our sector. I hope you enjoy this edition of the newsletter and look forward to seeing many of you in my 'neck of the woods' for the seminar in November.

PPSA exhibiting at IPCE 2014 in Calgary

Pig proves pipe is ready for inspection

PECAT™, a pigging based inspection tool supplied by **Circor Energy – Pipeline Engineering** is helping operators and contractors schedule and plan effective in-line inspections (ILI) of pipelines.

Inspections of pipelines are carried out to identify and locate defects and in-service damage that, if not repaired, could result in pipeline failure. This operation is performed by intelligent or 'smart' pigs which vary in technology and complexity depending on the assessment they will be used to perform.

It is accepted practice for most oil and gas pipelines to undergo ILI's as part of their ongoing integrity management; this may also be a legal requirement. Effective ILI operations rely on pipelines being clean and operators want to avoid ILI tools being sent through insufficiently cleaned pipelines. In advance of an ILI, or where pipelines are not regularly cleaned, progressive pigging programmes are often carried out to clean the line, with decisions on whether to run an ILI based on the results and debris returns being encountered.

While cleaning in advance of an ILI is clearly beneficial, the decision of when to inspect a pipeline is to some degree opinion based, as actual available data about the cleanliness of the line is largely based on analysis of debris quantities being returned with each pig run. To support and improve the decision process regarding when a pipeline is suitably clean for inspection, PECAT™, which is ATEX certified, can be sent through the line. PECAT™ uses in-built unique and patented sensor and data logging technology to measure the location and quantity of debris, as well as ovality, temperature and differential pressure. This data is used to help operators and contractors make informed decisions regarding the readiness of a line for an ILI.

A recent project in the UK North Sea where PECAT™ proved particularly beneficial involved a 16" export line which was experiencing high levels of wax formation on the internal pipe wall due to the low temperature of the crude oil.

Operational pigging was in place to remove the wax; however, previous attempts to inspect the line had not returned full sets of data. With another inspection due, the operator wanted assurance that the line was sufficiently clean. Initially a progressive cleaning campaign was carried out with pipeline pigs supplied by Circor Energy - Pipeline Engineering. As this cleaning progressed, changes in the quantity of wax being retrieved and the reduction in differential pressure indicated that the line had been cleaned. A gauging pig was also sent through the line which indicated that all potential obstructions had been removed.

PECAT™ was then run through the line to provide accurate data on quantities of wax remaining on the internal pipe wall, as well the location of any remaining wax. The data recorded by PECAT™ indicated that there were no significant quantities of wax left in the line, with typical readings of build-up on the internal pipe wall being less than 0.5mm.

Based on the results of the PECAT™ survey, an ILI tool was run and the inspection produced a full set of results.

Implementation of a specific progressive cleaning programme followed by running PECAT™ through the line proved to the operator that it was ready for inspection, ensuring they avoided the high expense, both in time and operational costs, of carrying out an ineffective ILI.

Circor Energy - Pipeline Engineering's PECAT™ inspection tool

Offshore ILI case study by Quest Integrity Group

Recently, a major exploration and production company faced a challenging situation to complete an integrity inspection of a 10-inch offshore production-to-storage pipeline in the North Sea. The challenges included low-flow conditions, a vertical launch and limited platform space - situations that would typically require front-end line, process and tool modifications. The client reached out to **Quest Integrity Group** to solve this ILI challenge.

Project Details

When the client set the initial scope of services for the project, it was assumed there would be a separate caliper inspection to get the geometry data on the line, which would have been difficult given the operating conditions. However, since Quest Integrity's ultrasonic ILI tool, **InVista™,** provides complete wall loss and geometry data, there was no need to perform a separate caliper survey. In addition, a gauge tool run is traditionally a safety measure ahead of an ILI run to make sure the line is unobstructed, but due to the high collapsibility factor of the InVista tool, it was not necessary.

The InVista tool was designed for challenging inspection environments, and was able to overcome the major challenges that this ILI project presented. First, the pipeline flow was exceedingly slow, but the inherent features of Quest Integrity's technology allow the equipment to work well in low-flow conditions. Additional challenges included a vertical launch and limited space on the platform deck. Since the InVista tool is compact and lightweight, it can be launched by hand, even in a vertical position. The tool was launched from the existing vertical launcher on the platform without handling equipment or line modifications that would have been made to accommodate larger and heavier ILI tools.

Inspection Results and Fitness-for-Service Assessment

Following the field inspection data verification and preliminary report, the pipeline inspection data was analyzed for wall thinning and anomalies such as corrosion, denting, and ovality, and the fitness-for-service of the pipeline was determined. The remaining strength factor (RSF) and reduced maximum allowable operating pressure (MAOPr) were also reported for the line.

Highlights of the inspection report included:

- A total of 19 external and manufacturing related metal loss anomalies were individually identified in the inspection data. The minimum measured thickness due to external metal loss was 13.1mm (0.516 in.). Based upon a nominal wall thickness of 20.6mm (0.811 in.), this metal loss corresponded to a 36.4% wall loss.
- A total of 17 dents in excess of 0.5% of the nominal outer diameter (OD) were identified in the inspection data. The maximum dent size was 2.2% of nominal OD.
- The minimum reduced MAOP calculated, according to the Part 5 Level 2 assessment methodology in API 579, was 28,220 KPa (4,093 psi).

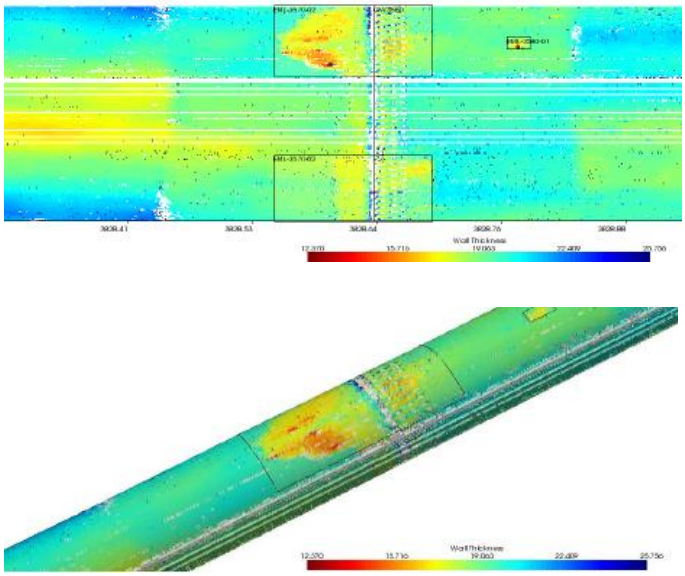


Figure 1. LifeQuest™ Pipeline 2D and 3D Images of External Metal Loss on the Line

Benefits

There were several benefits to using the InVista technology for this ILI project. First, the client saved

time and money as no front-end tool, line or operational modifications were required in order to complete the integrity inspection. The fundamental size of the tool, as well as navigational capabilities and a high collapsibility factor, effectively reduced the total project cost. Another major benefit was reduced risk and HSE concerns with the ILI project operation. Heavier and larger ILI tools would have required lifting equipment and more manpower to complete the inspection. By utilizing a lightweight and compact tool in the confined space of an offshore platform, the client mitigated risk for this ILI project.

Successful inspection of Coflexip flexible pipe on seabed with Innospection Ltd's MEC-FIT™

At the request of an operator in Norway, **Innospection Ltd** has recently performed a successful inspection of an 8" Coflexip Flexible Pipeline using the **MEC-FIT™** (Magnetic Eddy Current) technique. The challenge of the inspection was the detection of wire disorganisations and defects such as metal loss or wire cracking in the tighter wire setup of the flexible pipe with a 15° wire angle arrangement. The operational task was the inspection of the major accessible area of the flexible pipe on the seabed, including a larger bend of the exposed section.

The patented MEC-FIT™ technique was developed by Innospection to provide a reliable and technically advanced solution for the inspection of flexible risers operated from offshore installation. This field proven technique combines magnetic field lines with Eddy Current field lines which not only allows the deeper penetration into the various armour layers for defect detection in the inner layers but also enables the optimisation of inspection for a specific layer from which a defect signal is received.

Originally used for the detection of metal loss and cracking in flexible pipes with a 30°-45° wire angle of the armour layers, the MEC-FIT™ technique was successfully verified to be sensitive also in the detection of defects in flexible pipes having a tighter armour wire setup at 15° wire angle. With a signal to background ratio of >6dB, a 90% Probability of Detection was achieved for defect types like single and multiple wire gap in the outer layers, multiple wire gap in the inner layers as well as extra wire on top outer layer at 15° and 35°.

To overcome the subsea deployment challenge, a customised inspection tool known as the MEC-Crawler was built. This tool enables the scanning of the flexible pipe in the axial direction and can also be repositioned to perform the inspection in the circumferential orientation using its hydraulically driven wheels.

The scanner head with a multiple sensor array covers 180mm circumferentially and several axial runs with overlaps were taken to cover the major accessible areas of the flexible pipe. The distances driven are measured with an encoder wheel. An umbilical connected to the inspection tool not only supplied the electrical and hydraulic power but was used also for the routing of the signals via fibre optics to the Eddy Current Data Acquisition system located at the topside.

Inspection of flexible pipe on seabed with MEC-Crawler

Valero utilizes TDW's advanced inspection technology to detect anomalies and maintain pipelines

For **Valero Energy Ltd**, a subsidiary of international refiner and marketer of transportation fuels **Valero Corporation**, inspecting pipelines with efficient methods that generate data that offer a comprehensive picture of the condition of the line is critical. In the United Kingdom, Valero owns and operates the Pembroke Refinery on the west coast of Wales, the Mainline Pipeline, and associated feeder pipelines in Wales and England. Maintaining this complex refinery and vast network is demanding, calling for ongoing inspections to make certain every line is maintained to the highest standard.

To ensure that inline inspections of the lines are executed efficiently while generating the greatest amount of useful data, Valero recently retained global pipeline service provider **T.D. Williamson (TDW).** Valero's main objective was to rule out or identify threats to pipeline integrity.

TDW was to carry out inline inspections of several sections of the pipeline network using its **Multiple Dataset (MDS)** inline inspection platform with **SpirALL® Magnetic Flux Leakage (SMFL)** technology. Because the MDS tool generates multiple datasets in a single inspection run, it not only reduces inspection time, it closes the gaps inherent in individual inspection technologies. To illustrate, axial MFL is unable to detect anomalies that are located within the same magnetic field orientation. These include defects such as axial grooving and slotting; i.e., crack-like anomalies and preferential seam corrosion located in the long seam. SpirALL MFL technology was designed to locate anomalies with these narrow characteristics. In addition, by combining axial and SpirALL MFL, distinguishing between volumetric and planar or crack-like anomalies is much easier.

By using this technology to collect a wide range of in-depth data in a single inspection run, Valero would be able to assess the condition of each line, confident that they had a complete set of data upon which to formulate plans to repair or replace damaged or corroded sections.

Collectively, the three diesel lines extend for 181 km, from Pembroke – running 16 km east – to nearby Waterston, from Seisdon – stretching north for 113 km – to Manchester, and from Seisdon – running east for 52 km – to Kingsbury in England. Due to the substantial length of the two Seisdon lines, launch of the tool was carefully planned to make certain that it took place in daylight hours so that its location would be properly pinpointed at critical monitoring points and at the receiver at the end of the line. The TDW team also carried out gauge runs on each line to ensure that the line was clear of any blockages that would prevent the inspection tool from completing the run.

TDW's Multiple Dataset inline inspection platform

Inline Services' increases warehouse space

Inline Services is currently in the process of increasing its warehouse space and by the end of November 2014 should have their second building complete with the largest inventory of the most commonly used cleaning pigs on the market. With this dynamic market's demands their goal is to be able to provide same day service. They are also expanding sales, shipping and administrative positions as well as improving their Safety, Training & Quality Program.

...and gas transmission operator benefits from 42" Speed Control Pig

Their current list of 2014 activities continues to grow from scheduling their 42" **Speed Control Pig (SCP)** for a major gas transmission operator, who's set to run the tool in October. The cost savings in running the SCP by not having to reduce flow rates, plus obtaining the best possible cleaning of the pipeline, more than justifies this process. They have also recently been awarded a 42" large diameter sphere order from another major gas operator, who will be using the spheres for product batching.

... and record year for consulting

2014 has been a record year for their consulting division too having assisted several operators (liquid & gas) with pig selection and programming for cleaning their problem pipelines. Their new pig retriever pole, new disposable transmitters and non-intrusive pig detectors are also in stock to meet increasing demand.

Inline Services' Speed Control Pig

NDT Global appoints new Chief Executive Officer

NDT Global, a leading supplier of ultrasonic pipeline inspection and integrity services, has the honor to announce Gunther H. Blitz as Chief Executive Officer of NDT Global Europe.

Mr. Blitz has held various positions in the pipeline and plastics industry and has worked in several senior management positions. His broad experience in the Oil & Gas Industry will significantly strengthen NDT Global's leadership team.

NDT Global has embarked on a steady growth course with significant investments in inspection tools, engineering capacity and skilled workforce. The company's focus on long-term strategic development and international expansion has already resulted in framework contracts with major oil and gas companies and new offices in Malaysia and Russia.

"We are very proud that Gunther Blitz has been convinced by the exciting opportunities for development and growth at NDT Global", says NDT Global President Wolfgang Krieg, "and we are looking forward to his role of shaping and building our further long-term success".

The ROSEN Energy & Innovation Forum 2014

The ROSEN Energy & Innovation Forum held in June in Lingen at the **ROSEN Technology & Research Center** in Germany was a huge success focusing on key questions inside the oil and gas industry with approx. 150 guests from over 20 countries participating.

"The key take away from our panel discussions is that the interdisciplinary exchange of ideas is the key factor to boost innovation processes", said Friedrich Hecker, CEO of the ROSEN Group. He continued to say that it is crucial for the benefit of the whole industry to bring operators, regulators and innovators together to one table." He highlighted the importance of exchange between all relevant stakeholders and appreciated the open feedback and discussions from operators and regulators.

Within three subsequent panel discussions, highly reputable members from industry associations, operators, universities, regulatory and Government representatives discussed intensively on the topics of Assurance, Innovation and Safety.

Panel 1: Assurance
Agreeing to the fact, that fundamental cultural differences are a challenge, the harmonization of standards & regulations is welcome throughout the international oil & gas industry. Regulation is recognized as chance to learn from the experiences of others, which overall facilitates business in an industry dealing with global norms but local assets.

Panel 2: Innovation
How to make people innovators, how to establish an inspiring culture of innovation? The lively panel underlined the importance of collaboration not only between different disciplines but also across the industry. The participants concluded that there are no limits to creativity processes in which a "no" is not allowed. Innovation has to be a win-win situation for people and enterprises – therefore investments in leveraging experience and operational knowledge are necessary.

Panel 3: Safety
Safety is one of the most important points – which needs a higher public awareness. Being more pro-active rather than being reactive. It's a must to better inform the public about the energy industry and their role in a globalized world.

The panel discussions were followed by technical workshops, live technology demonstrations and facility tours, ROSEN also opened its Technology & Research Center showcasing some of the latest technologies in Germany.

Compliance of ROAIMS to international codes

The **ROSEN Group** is proud to announce that BUREAU VERITAS has issued a Conformity Statement confirming that the methodology embedded in ROSEN`s highly acclaimed **ROAIMS Pipeline Integrity Management Software Suite** fully complies with the requirements of the following globally relevant codes, namely ASME B31.8S, API 1160 and PNGRB-IMS.

Asset Integrity Management Software, as incorporated into the ROAIMS suite is essential in order to handle the large volumes of inspection, operations related and material data involved in the integrity decision making progress. The suite of software provided by ROSEN consists of a collection of interoperable software tools that support asset maintenance planning in a reliable, safe and cost-effective way. The key objective of ROAIMS is to enable an efficient, auditable and well-structured integrity process to support operators and add value to their business.

The assessment performed by BUREAU VERITAS revealed 100% compliance to the above mentioned standards and therefore confirms the quality and effectiveness of ROSEN`s ROAIMS suite in effectively supporting the Pipeline and Asset Integrity Management Systems of operators in the oil & gas industry.

STATS Group invests £1 million in North America and the Middle East

Pipeline engineering specialist **STATS Group** has invested more than £1 million in a double pronged expansion in North America and the Middle East.

In Canada, the isolation and integrity testing business has upscaled to an Edmonton facility twice the size of its previous premises and has recently opened a project support office in Calgary.

The company has been operating in Western Canada for seven years and the extended Calgary facility includes 15,000 sq ft (1394 sq m) of office, workshops, test bays and tool storage space. Recruitment is underway to add to the 15-strong staff and turnover in North America is expected to account for 20% of the group's global revenue.

STATS Canadian General Manager, Stephen Rawlinson said: "We have recently completed a substantial contract offshore Canada for a major operator, providing isolation services to allow the subsea replacement of a section of an 18" natural gas pipeline. Following other recent contract wins we are making a substantial investment in infrastructure and asset build for the North American market in 2014 and beyond."

STATS' Middle East business, led by Regional Director Angus Bowie, is reaping the benefits of a new 12,000 sq ft (1100 sq m) workshop which has opened in Abu Dhabi.

Located in Mafraq, the facility includes assembly bays, pressure test bays and stores, and complements an existing sales and engineering office in the Corniche area. It will be used to support assembly, test and mobilisation for Middle East workscopes and for Factory Acceptance Tests.

The team is now 22 strong following the recruitment of Operations Manager Thomas Simpson and two graduate engineers and extra staff are being recruited as part of a phased expansion plan for the Middle East market, which has included establishing a separate trading entity in Qatar.

Angus Bowie said: "We are now building infrastructure in the Middle East and the new Abu Dhabi facility gives us a proper presence and the foundations to substantially increase our market share."

"We are working across the region in UAE, Oman, Qatar and most recently in Saudi Arabia. We expect to see an uplift in the emergency repair work we carry out and revenue from the Middle East region will contribute to around one quarter of group revenue this year."

ROSEN Group introduces new manufacturing facility in Alberta, Canada

The **ROSEN Group** proudly introduced their new manufacturing plant in North America to the mining industry. On the occasion of the "Oil Sands Trade Show and Conference" at Fort McMurray, AB, the ROSEN Group started their series of events, named "Alberta Bound Roadshow 2014", displaying both outstanding capabilities in development and manufacturing of intelligent plastic solutions as well as lined specialty spool pieces.

"We are very satisfied with the outcome of the roadshow. We have met the right people from various disciplines of the right industries – ranging from operators to engineering companies that used this opportunity to get informed about the ROSEN Group and our products and services portfolio", stated Corporate Marketing Director Michael Magerstaedt. "It was a pleasure to see, how our life-size spool exhibits spurred intense discussions amongst visiting experts. We truly gathered the feeling that a roadshow is an innovative way to introduce our **RoCoatTM** directly to our customers", he concluded.

The Alberta Bound Roadshow comprised of a series of events at different locations in Fort McMurray, Edmonton and finally in Calgary, where the new facility will be located. Planning to go on stream during the first quarter of 2015, the ROSEN Group are establishing a local source for the RoCoatTM interior pipe liner in Canada. Liner produced at Calgary will be identical to the product manufactured at this technology's "birthplace" in Lingen, Germany and successfully applied in Alberta oil sands tailings and hydrotransport pipelines. This facility is the first of its kind in Canada to apply hot cast polyurethane liner to pipe spools of diameters up to 48" in lengths up to 18 meters (60 ft). The new facility will encompass internal pipe coating, pipe refurbishment for pipe re-lining and manufacturing of our Intelligent Plastic Solutions product line, most prominently RoCoat™ internal abrasion protection liner.

Jee Ltd hosts workshop on integrity management of subsea pipelines

Jee Ltd is joining the expert line up at the Subsea Integrity Management Conference in Aberdeen on 2-3 December 2014. The conference will see Jee Technical director, Mike Hawkins deliver a technical case study on 'The challenges of concealed corrosion on a critical gas riser' and present a review of a Premier Oil case study for effective integrity management of offshore risers.

Jee will also be taking centre stage by hosting a half day innovative taster training workshop immediately after the conference on 4 December. The training delivery will focus on Integrity management of subsea pipelines and is open to Diamond pass SSIC ticket holders. The Diamond pass ticket can be transferred onto a company colleague for the Jee training course.

Jee post-conference training: Integrity management of subsea pipelines – 4 December 2014

Summary

- An introduction to pipeline integrity, including failure and pipeline inspection
- Pipeline Integrity Management System (PIMS)
- Learn how to identify issues and assess a range of integrity threats

If you are interested in finding out more about the Jee training workshop or would like to register interest to attend, please contact marketing@jee.co.uk

FREE technical information service

Contact our members and panel of advisers to answer your questions about pigging and pipeline integrity at:

ppsa@ppsa-online.com

Basic valve interlock configurations by Netherlocks Safety Systems BV

In pipeline pigging procedures, different valve interlock configurations can be distinguished, depending on the complexity of the pigging procedure. In this article, 3 basic configurations are described in detail.

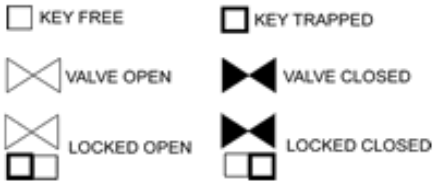
Pipeline pigging configuration 1
Application field

This configuration is applicable:

- when the drain and vent are connected to an open system;
- when no venting to a closed system is required prior to opening the atmospheric vent.

Symbol index

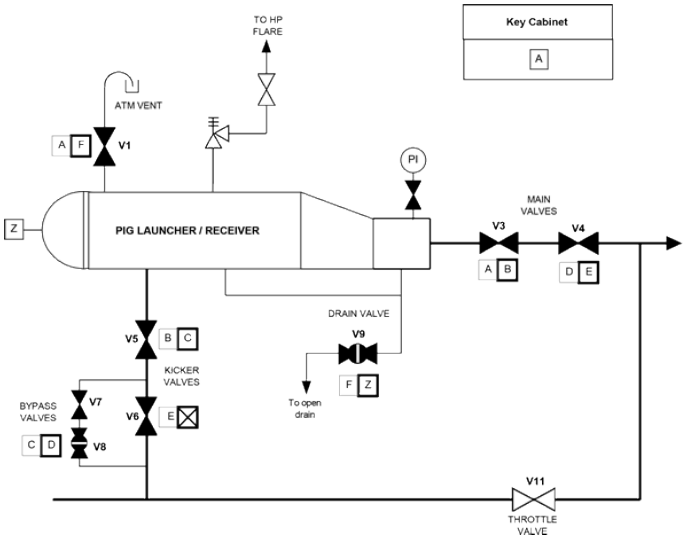
The following symbol index applies to all configuration schematics in this article:



Basic functionality

- All main and kicker valves to the vessel are locked closed before the closure door can be opened;
- The atmospheric vent and open drain have to be opened before the closure door can be opened.

To start the pigging procedure, start key A is taken from the control room and used for (a) opening the atmospheric vent before opening the closure door or (b) opening the main line and proceeding with pressurizing the vessel.



Sequence specifics

This safety level can be achieved with the use of a linear interlocking sequence. All valves are operated in a linear order and reverse-operated in the reverse order.

Pipeline pigging configuration 2
Application field

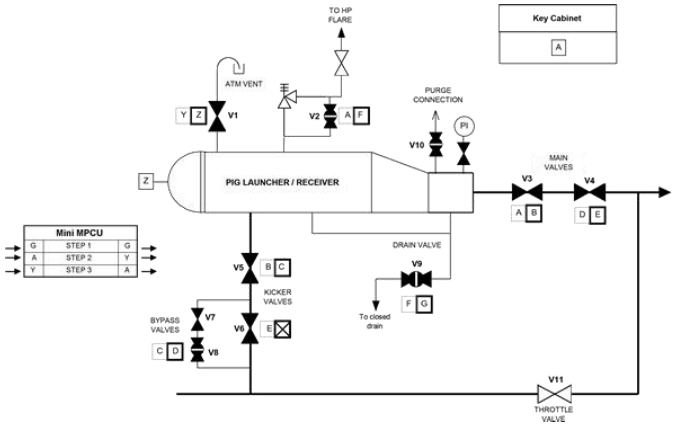
This configuration is applicable:

- when the drain is connected to a closed system;
- when venting to a closed systems is required before atmospheric venting is allowed.

Basic functionality

- All main and kicker valves to the vessel are locked closed before the closure door can be opened;
- Before the vessel is opened, the draining and venting procedure is performed at least once;
- The atmospheric vent has to be opened before the closure door can be opened;

To start the pigging procedure; Start key A is taken from the control room and used for (a) opening and closing vents and drains; only after that, the atmospheric vent and the closure door can be opened or (b) opening the main line and proceeding with pressurizing the vessel.



Sequence specifics
This particular configuration can be achieved by using a 'mini-MPCU' in pigging operations. This device is used to affirm opening and closing of the vent and drain. Only after opening and closing of these valves, the key is released that opens the atmospheric vent, after which the key is released to open the closure door.

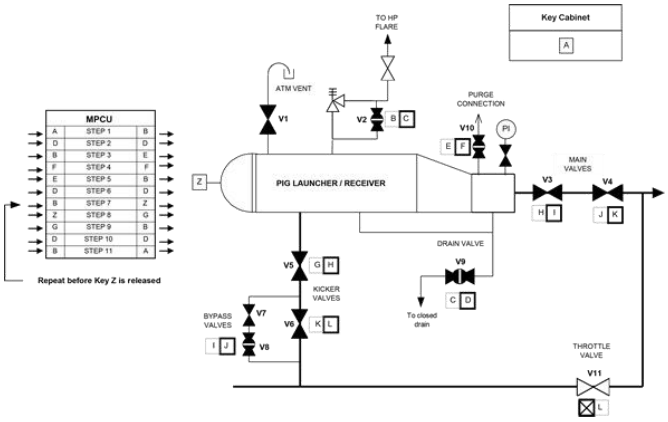
Pipeline pigging configuration 3
Application field

This advanced configuration is applicable:

- when the vent and drain is connected to a closed system;
- when one or more purging cycles are required to degas the vessel before it can be opened safely.

Basic functionality

- All main and kicker valves to the vessel are locked closed before the closure door can be opened;
- The vents and drains are opened and closed again, the purge is opened and closed again, then vents and drains are opened and closed once more;
- Above cycle may have to be repeated several times before the closure door can be opened;
- The atmospheric vent has to be opened before the closure door can be opened;
- After launching, the vessel is guaranteed to be vented and drained.



Sequence specifics
This configuration can be achieved by using a Mechanical Process Control Unit (MPCU). The MPCU is a mechanically-programmed key exchange system where sequence steps need to be confirmed before one can proceed to the subsequent step. After venting and draining key D is released and inserted in the MPCU, confirming that vents and drains have been opened. The same key is released and drains and vents are closed again, resulting in the release of key B from the vent, which is entered in the MPCU to confirm the closing of vents and drains. Similarly, the opening and closing of the purge valve is confirmed in the MPCU. After that, the venting and draining is repeated. If required, purging, venting and draining is repeated several times using the MPCU. After the required number of repeated steps of venting, draining and purging, the key is released to open the closure door.

More complex configurations
Over the years, Netherlocks has designed hundreds of valve interlock configurations, of which many for pipeline pigging. Often, these configurations are more complex than the ones described in this article. Procedures for more complex configurations can include:

- Hot oil flushing
- Chemical flushing
- Purging and flushing
- Portable pig launchers
- Hydrotesting
- Dewatering
- Bi directional pigging
- Gas pigging

ILI with TDW's Multiple Dataset Platform to improve hard spot detection

Pipeline hard spots are created due to localized quenching of steel during the manufacturing process. A potential threat to pipeline integrity, hard spots can become brittle and crack with time and under certain conditions. As such, operators with an environment conducive to the development of these cracks are very interested in detecting and addressing the threat before they contribute to a failure event.

A major US pipeline operator suspected hard spots with potential for cracking on a section of one of its 30-inch pipelines. They needed the ability to not only locate the hard spots, but to detect cracking initiated within the hard spots themselves. This level of characterization would provide the operator with a means to prioritize, allowing them to address the most critical hard spots first. The operator requested support from **T.D. Williamson (TDW)** to provide improved detection and characterization of its hard spot integrity threats. The technology selected was the **Multiple Dataset Platform (MDS) with SpirALL® Magnetic Flux Leakage (SMFL).** MDS utilizes multiple technologies, on the same tool, to overcome the limitations of individual inspection technologies. The platform includes deformation, high field axial magnetic flux leakage (MFL), patented SpirALL® MFL, low field axial MFL, and XYZ mapping.

Each technology on the platform provides a unique assessment of an integrity threat. The low-field MFL provides primary detection of hard spots, high field MFL confirms, and SpirALL® MFL identifies any crack-like defects within the hard spots. The data collected by the MDS platform is captured, synchronized, and analyzed in a single software, providing a unique assessment where one, two, or even three technologies may not be sufficient to detect, characterize, size, and prioritize given integrity threats.

The MDS inspection analysis confirmed the operator's suspicion: cracking within hard spots. Due to the advanced characterization offered through the overlapping inspection data, the operator was able to prioritize the hard spots and address as needed. The MDS platform has been used to detect integrity threats such as hook cracks, lack-of-fusion, selective seam weld corrosion, mechanical damage, and axially -extended metal loss. As a result of this technology, pipeline operators are looking to the potential of MDS to help solve detection and characterization challenges with a variety of additional integrity threats.

STATS Group performs first BISEP™ in Saudi Arabia

STATS Group performed its first **BISEP™** intervention and isolation operation in the Kingdom of Saudi Arabia. Two 6" BISEPs™ were utilised to carry out multiple operations in Damman's Second Industrial Area on behalf of a natural gas distribution company. The client has a vast underground distribution network providing natural gas to industrial clients throughout the city. The two BISEPs™ were deployed simultaneously to provide a mid-line isolation of a 70 metre section of the network while hot work modifications were performed with the system live and at full operational pressure of 19 bar.

The pipework followed a main four lane highway through the city, which presented additional safety challenges. One lane was partially closed while excavation work to uncover the pipe work was carried out, allowing STATS technicians access to complete the intervention and isolation work. The highway remained open for the duration of the workscope.

The BISEP™ provides fully proven double block and bleed isolation deployed through a single hot tap penetration. The dual energised seals provide an annulus port that proves and monitors the seal integrity before and during the intervention work. The high integrity isolation provided by the BISEP™ allowed welding to be performed on the gas system in an industrialised area without shutting down. Once the maintenance was completed and the BISEPs™ were recovered, completion plugs were fitted to the split tee flange allowing the fittings to remain on the line.