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TAP powers towards completion
The 878 km Trans Adriatic Pipeline is now more than 90 per cent complete after four years of construction.
Cover: Personnel checking the boring machine prior to assembly. Image courtesy of Trans Adriatic Pipeline AG, all rights reserved.

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From the Editor

This issue of Pipelines International has its usual feast of technical reports and industry insights. But this got me thinking – yes, this is a good magazine to read, but why do we actually read it? Is it because we are obsessed with pipelines and need to get a life? Or is it because we want to learn? I belong to the latter group – although my children and grandchildren would probably, cruelly, put me in the former.

I like to consider myself a ‘lifelong learner’. This means I always want to learn – it does not mean I know very little, or I am very slow at learning – although, again, my children and grandchildren would probably suggest otherwise.

What is learning? Learning is the acquisition of knowledge – humans and animals (and some would say, today, machines) can learn. Knowledge is based on data, information and experience, and it can change our lives, through changing our behaviour and understanding the world around us a little bit better.

But what is more important – data, information or experience? Well, data are simply facts and information is a collection or linkage of data. So, really, we are asking what is more important – information or experience? Good question. Albert Einstein (1879–1955) was a clever guy, right? Let’s see if he can help. He said, “Information is not knowledge. The only source of knowledge is experience.”

The great thing about articles in magazines such as Pipelines International is that the contributors have great experience and are passing on their knowledge to all of us, through their articles. Behind every good article is an experienced mind and the opportunity to learn.

Learning is essential today – we face so many changes in technologies, business processes and our workplace, that learning is needed to simply survive and keep up with this pace of change. Indeed, the ability to learn allows change and adaptability, and this is a skill that employers should be looking for.

Staying on the subject of learning, I’m sure many of you were at this year’s Pipeline Pigging and Integrity Management Conference and Exhibition (PPIM) in Houston in February. It gets better and bigger every year – well done to all involved.

It is, of course, a learning experience. PPIM actually offers ‘blended’ learning, where a mixture of training courses, guest speakers, conference papers and exhibitors present differing learning methods and experiences, which is recognised as the best way to learn. But, to me, the most important part of PPIM is meeting, talking, socialising, etc., with all the attendees.

Why? Well, today’s workforce is increasingly dispersed, working remotely, from home, or in smaller groups. Soon, this workforce may be virtual, with few interactions. This will make conferences and exhibitions more important than ever.

What if we decide not to learn? Interesting… I recall the World Bank saying something like ‘learning is at the centre of building human capital’. Sounds like good business. But, one thing is for certain – if you decide not to learn, prepare to go backwards.

Which brings me back to our publication. Read and learn, but – more importantly – enjoy this edition of our magazine.

Phil Hopkins
Editor-in-Chief
The BISEP® with extensive track record provides industry first double block and bleed isolation while maintaining production. Hydraulically activated dual seals provide fully monitored leak-tight isolation, every time, any pressure.
PennEast files new pipeline plan

PennEast Pipeline Company has filed an amendment to construct the federally approved PennEast Pipeline Project in two separate phases. Filed with the Federal Energy Regulatory Commission (FERC), PennEast said the amendment is a step towards meeting the urgent and growing need for clean and low-cost natural gas in the Greater Philadelphia region. Under the new proposal, Phase One of the project would consist of 36 inch (915mm) pipe for 111 km, constructed entirely within Pennsylvania and anticipated to deliver natural gas by November, while the second phase would comprise the remaining route in Pennsylvania and New Jersey with a targeted completion of 2023. Under the phased approach, PennEast will have three Pennsylvanian delivery points: UGI Utilities to serve the Blue Mountain Ski Resort in Carbon County, and new interconnections with Columbia Gas and Adelphia Gateway to serve the growing demand in the southeast region.

Algerian gas pipeline completed

Eni has completed construction of a new natural gas pipeline in the Berkine Basin, Algeria. The 185 km long, 16 inch (406 mm) pipeline has a transport capacity of 7 million m³ of gas per day and will serve as a connection between the BRN and MLE fields in the Berkine. The pipeline will export gas produced in Berkine’s Block 403 along with gas fields in North Berkine where the first four wells have recently been completed. Known as a ‘fast track’ project, the pipeline is a shared commitment by Italy-based Eni and the Algerian state-owned SONATRACH to accelerate the time to market while also contracting companies that are part of the SONATRACH group to carry out the works. Gas in the Berkine is expected to produce approximately 6.5 million m³ and 10,000 bbl of associated liquids, which along with the oil interests will create an overall production of 65,000 bbl/day by the end of 2020. Production from oil fields in the same blocks began in May 2019.

CJ Express Expansion goes ahead

Midcoast Energy has made a positive final investment decision (FID) in support of the CJ Express Expansion Project in Texas, US. The project will add compression and pipeline facilities at multiple locations on Midcoast Energy’s existing East Texas pipeline system. Aiming to provide transportation of natural gas supplies from East Texas to the Texas Gulf Coast, the pipeline and its new expansion activities will increase gathering capabilities in the high-growth Shelby Trough area of the Haynesville Shale. The expansion will also increase Midcoast’s Clarity pipeline transmission capacity to Gulf Coast demand centres to approximately 1 billion cf/d. The CJ Express Expansion Project is anticipated to be complete in early 2021.

Brazil gets first LNG terminal

Centrica and Centrais Elétricas de Sergipe S.A. have collaborated to commission the first private liquified natural gas (LNG) import terminal in Brazil, South America. In early February, a Centrica-chartered vessel – the Singapore Energy – delivered 95,000 m³ of LNG by a ship-to-ship operation to the Golar Nanook Floating Storage Unit (FSRU). The FRSU, located 8.5 km off the Brazilian coast, is connected to CELSE’s Usina Termoelétrica (UTE) Porto de Sergipe I – a combined-cycle, gas-fired power plant. Centrica Energy Co-Managing Director Marketing and Trading and Global Head of LNG Jonathan Westby said Centrica is happy to commence this collaboration with Golar and CELSE and is pleased to have completed the ship-to-ship transfer. The Porto de Sergipe I power plant includes the FSRU and additional maritime installations, being an underwater anchoring system and a pipeline that transports the gas to the plant itself. The 8 km pipeline was constructed in 2018.
Baltic Pipe confirms location
The Voivode of the West Pomerania province has issued a location decision for the Polish part of the Baltic Pipe offshore pipeline. The decision defines the location for the line valve station (LVS), the DN 900 onshore pipeline connecting the LVS with the offshore section and the 56 km offshore gas pipeline of the Baltic Pipe Project. The offshore pipeline will be laid on the Baltic Seabed in the Polish marine area, which covers both the territorial waters and the Exclusive Economic Zone. GAZ-SYSTEM has also approved the design for the pipelay of the seabed and the installation of the section, which will connect the offshore pipeline with the LVS. Obtaining the location decision, in conjunction with this approval, has allowed GAZ-SYSTEM to apply for a construction permit for this section of the Baltic Pipe, which GAZ-SYSTEM President Tomasz Stępień said is a decision that will be issued by the Voivode of West Pomerania province, possibly by the second quarter of 2020.

Russia set for 24 new pipelines
Russia is expected to produce a total of 24 new-build pipelines by 2023, according to a new GlobalData analysis. GlobalData said Russia’s new installations would account for 84 per cent of new oil and gas pipelines in the Former Soviet Union (FSU) between 2020 and 2023, with the new infrastructure expected to have a total combined length of 10,497 km. GlobalData also said Turkmenistan was likely to be the second highest FSU contributor thanks to the addition of the Central Asia-China Line D onshore gas pipeline, which will run 1,000 km. The pipeline will be 100 per cent owned and operated by Trans-Asia Gas Pipeline and is expected to come online in 2022. Additionally, Nord Stream 2 is the longest of Russia’s upcoming pipelines with a total length of 2,400 km which GlobalData Oil and Gas Analyst Adithya Rekha said would be operating later this year.

STATS completes extensive pipeline isolation
STATS Group has completed an extensive pipeline isolation campaign for an operator in Malaysia. The campaign comprised 12 pipeline isolations over six months in West Malaysia and Sarawak on behalf of partner Handal Energy Berhad for a major Malaysian operator, representing the largest integrated campaign ever undertaken by STATS in the region. The works featured STATS’ Remote Tecno Plug® (RTP) – ranging from 12 to 32 inches (304 to 813 mm) – which provided inline pipeline isolation to allow the live repair and replacement of valves on onshore and offshore assets. The project was completed by teams from the STATS Beranang workshop in Kuala Lumpur and supported by UK and UAE personnel, who worked jointly to ensure the safety and scheduling of the works. STATS Regional Manager for Asia Pacific Gareth Campbell said the success of the project is making the company look forward to future opportunities.
Eddyfi/NDT acquires Halfwave

The newly minted Eddyfi/NDT entity has acquired Halfwave and its Acoustic Resonance Technology (ART).

Halfwave Subsea will merge with TSC Subsea, while its inline inspection (ILI) body – Halfwave AS – began its integration with NDT Global at the Pipeline Pigging and Integrity Management (PPIM) Conference in Houston, US.

The integration process is expected to be finalised during 2020 and Eddyfi/NDT said NDT Global’s operational expertise will help improve the robustness of Halfwave’s ART inspection service.

Eddyfi/NDT CEO Martin Theriault says the entity is first and foremost an NDT technology company.

“The uniqueness and proprietary nature of the ART technique was an opportunity we could not miss. Eddyfi Technologies will benefit from leveraging a new modality to create a multitude of new applications,” said Mr Theriault.

“TSC Subsea will add a second, highly differentiated modality to its offering.

“NDT Global will officially enter the in-service gas pipeline segment and present a competitive alternative to EMAT insofar as SCC crack detection.”

Halfwave CEO Paul Cooper says the company was excited to join the Eddyfi/NDT team.

“It has been a great journey growing and developing the ART NDT platform into unique market-leading pipeline and subsea inspection applications,” he says.

“Eddyfi/NDT’s impressive complementary technology portfolio, technology focus and global footprint provides the perfect vehicle for ART to realise its full potential in the market.”

Halfwave was acquired from its main shareholders EV Private Equity, Shell Ventures, Chevron Technology Venture and DNV GL.

The Eddyfi-NDT Global merger was announced in February 2020.

PRCI awards promotions

The Pipeline Research Council International (PRCI) has promoted both Laurie Perry and Gary Choquette.

The newly promoted staff members will work closely together to develop the program management team for PRCI.

Ms Perry has more than 30 years of experience working in the oil and gas industry, including being an active participant in supporting organisations; since joining PRCI in 2015, Ms Perry has served as a Program Manager, playing a key role in the organisation and being an integral part of the research execution efforts.

After leading both the Corrosion Committee and Underground Storage Technical Committees in her time, Ms Perry has earned a promotion to Senior Program Manager where she will continue to facilitate her committee roles.

Working closely with Ms Perry is Mr Choquette, who has worked in the natural gas transportation for more than 30 years himself.

After joining PRCI in 2012 as a Senior Program Manager and leading the Measurement Technical Committee and the Compressor and Pump Station Technical Committee, Mr Choquette has continued to provide strategic vision for the research portfolio.

Most recently, Mr Choquette has held the position of Director of Research Executive before earning the current promotion to Executive Director of Research and IT.

In this expanded role, Mr Choquette will lead the software development and maintenance program, as well as working closely with key contractors to ensure the research portfolio’s overall success.
Clariant opens UK lab

Clariant Refinery Services has opened a new crude and fuel oil laboratory in Bradford, England.

Supported by a highly experienced technical services team, the new laboratory will act as a global centre focusing on applications for transport and storage of crude and fuel oil and is equipped to address multiple challenges faced throughout the oil industry, including in pipelines and storage terminals.

To assist customers in meeting the International Maritime Organisation (IMO) 2020 regulations, the facility will also focus on tackling pour point and stability challenges.

The IMO 2020 regulations have ruled that, as of 1 January 2020, marine sector emissions in international waters need to be limited to 0.5 per cent from the previous 3.5 per cent limit.

Clariant Head of Refinery Services Kay Kutschbach says IMO 2020 is a challenge for the entire industry with customers requesting solutions tailored to specific requirements; the new lab will achieve this through its ability to replicate field conditions and analyse products’ full performance potential in a real-life simulation.

“With a global service reach, our investment in a state-of-the-art laboratory supports customer focused developments,” said Mr Kutschbach.

“This allows Clariant to offer proven performance to match future customer needs.”

Attributed to the lab’s innovative methodologies, Clariant has already developed products and stabiliser solutions specific to challenges presented by the new regulations.

The lab was officially opened on 23 January 2020.

Chevron, Saudi Aramco join Hydrogen Council

The Hydrogen Council has expanded its membership, welcoming a host of major industry names to its ranks.

Woodside, Chevron and Saudi Aramco are among the 22 new members named to the group, taking its total number of participants to 81. The Council is a global initiative of energy, transport and industry companies facilitating the deployment of hydrogen solutions around the world to help foster the transition to clean energy.

Fortescue Metals Group, Siemens and McDermott were among the other names welcomed to the group in Brussels ahead of the Council’s third anniversary CEO Event held in Versailles, France in January 2020.

Hydrogen Council Co-Chair and Air Liquide CEO Benoit Potier said it was pleasing to see continued interest from world-renowned companies.

“In the past three years the Hydrogen Council has boosted global collaboration and the industry is firmly positioned to scale up hydrogen solutions around the world,” he said.

“Increased support from new countries and investors is a testament of the strong momentum we have built.

“It is through this continued collaboration and the scaling up of hydrogen solutions that we will achieve the environmental and economic benefits toward a low carbon society.”

When the Council was founded in 2017 it contained 13 members.

Today’s coalition of companies collectively represents US€18.7 trillion ($20.8 trillion).

Wood to sell services business

John Wood Group PLC has announced the sale of its industrial services business to technical services provider Kaefer.

Wood’s industrial services business provides integrity and fabric maintenance for assets in the marine, process energy, offshore oil and gas sectors and infrastructure division through the UK and Ireland.

The sale to Kaefer comprises an initial cash consideration of US$104 million and a further potential payment of approximately US$14 million pending financial goal agreements.

Wood CFO David Kemp says the purpose of the sale is maintaining a strong balance sheet and achieving target leverage.

“As our focus has moved towards building a premium, differentiated and higher-margin business, the industrial services offering is no longer core to our strategy,” he says.

“However, it is an excellent fit with Kaefer who see a clear opportunity to grow the business further and extend its market share across new sectors and geographies.”

The divestment follows the planned sale of the company’s nuclear business, which was announced in 2019 and is anticipated for completion in the first half of 2020.

Do you have company news you would like featured in Pipelines International?
Email your announcements to Journalist Sophie Venz at svenz@gs-press.com.au

David Kemp.
Vale Andrew Palmer
Professor Andrew Palmer was most recently Keppel Chair Professor of the Centre for Offshore Research and Engineering (CORE) in the Department of Civil Engineering at the National University of Singapore.

He divided his career equally between practice as a consulting engineer and university teaching. In 1985 he founded Andrew Palmer & Associates, a noted company of consulting engineers specialising in marine pipelines.

In 1996, Professor Palmer returned to research and university teaching as Research Professor of Petroleum Engineering at Cambridge University in the UK. He was also a Visiting Professor in the Division of Engineering and Applied Sciences at Harvard University from 2002 to 2003.

Tremendously accomplished, Professor Palmer was a Fellow of the Royal Society, a Fellow of the Royal Academy of Engineering, a Fellow of the Institution of Civil Engineers and past chair of the Det Norske Veritas Pipelines Committee.

Dr Phil Hopkins, an independent consultant based in the UK and a former Managing Director of Andrew Palmer & Associates, remembers Professor Palmer as a generous and intelligent man with a great sense of humour.

“Andrew was kind enough to be the keynote speaker at a conference I helped organise in the 1990s. He sent me his paper for inclusion in the proceedings, and a copy of his presentation, well before the conference dates,” Dr Hopkins says.

“He started the conference with his keynote, but it quickly became clear his presentation was completely different to the one he’d sent beforehand, and it had nothing to do with his paper in the proceedings.

“Immediately after his presentation I asked him if he knew that his presentation was different, and not related to his paper. He replied: ‘Yes, did you enjoy it?’ ‘Well, yes’, I said. ‘It was excellent.’ To which he replied ‘Well, it looks like you’ve been very lucky today, let’s hope the other presenters do the same thing.”

Professor Palmer was engaged in marine pipeline engineering for 45 years and played a leading part in many pipeline projects in the North Sea, the Middle East, Canada and the Far East. He was the author of four books and more than 250 published papers on pipelines, offshore engineering, ice loading and geotechnics.

More than 1,000 engineers have attended Professor Palmer’s renowned course, Subsea Pipeline Engineering, which he presented with his friend Dr Roger King, and those who attended the course – plus many more – rely on their textbook of the same name. Professor Palmer was a friend to many in the industry and his research, published works and ideas will continue to have a great impact on engineers and the broader pipeline community for years to come.

Truly a unique mind, Pipelines International sends its condolences to Dr Palmer’s family and friends.
Engineering for the Nord Stream 2 Pipeline Project

by Pavel Persidskii, Chief Technical Officer, Nord Stream 2 AG

Nord Stream 2 is an international cooperation project to build a new pipeline across the Baltic Sea, providing the European energy market with direct access to the world’s largest gas reserves in Russia. When complete, the twin pipeline system will have the capacity to transport 55 billion m$^3$/a from Narva Bay near St Petersburg to Germany’s Baltic coast at Lubmin, where it will be connected to the European gas grid.

The need for such a new pipeline was recognised by Europe’s energy industry with five of Europe’s major energy companies committed to funding half of the project. The industry was faced with declining domestic gas production – especially the announced reduction in gas from, and imminent closure of, the Groningen field – and there was a growing political imperative to replace coal-fired power generation with more climate-friendly gas power stations.

Another key development driving such a project was the increasing integration of the European market for gas, where market regulation and investment in interconnectors and LNG receiving terminals had led to more competition to supply the market and an increased need to provide flexibility of supply. It became clear the Nord Stream 2 pipeline could be a valuable and competitive addition to Europe’s energy infrastructure.

ENGINEERING CHALLENGE

Nord Stream 2 will enable Europe to benefit from the development of large gas fields on Russia’s Yamal peninsula, such as Bovanenkovskoye (~4.9 trillion m$^3$ – initial gas reserves). The new infrastructure will deliver gas efficiently and reliably to Russia’s domestic and international customers.

The so-called Northern Corridor and the pipeline through the Baltic Sea will take the gas 4,300 km to Europe. The northern route is not only the more direct one, but also maintains higher pressure than older transport systems.

The engineering challenge was to design a pipeline system and plot a precise route for it along the bed of the Baltic Sea. A route closely following the first Nord Stream was chosen and much of the engineering that went into the original could be replicated for the new pipeline; but, in the years since the first Nord Stream was designed new technology and new solutions could also be used to manage the unique characteristics of Nord Stream 2.

Engineering the Nord Stream 2 pipeline has required a massive international effort. No fewer than 1,000 companies from 25 countries have been working together to plan and deliver this infrastructure.

The results will be lower transportation costs and lower greenhouse gas emissions, which are some of the many ways that clever engineering helps deliver a more sustainable, efficient and economically beneficial outcome.

The Nord Stream 2 engineers have put together a project whereby 200,000 individual 24 t pipe sections are laid along a 1,234 km route that passes through the waters of five countries, being Russia, Finland, Sweden, Denmark and Germany.

SEABED ANALYSIS FOR THE BEST POSSIBLE ROUTE

Extensive and sophisticated survey operations have been central to every stage of the project. The entire pipeline route from Russia to Germany
was planned and precisely plotted based on the findings from these surveys.

The initial route corridor was selected based on an exhaustive desk study considering existing survey data along with environmental and technical constraints. This initial corridor was mapped over a width of at least 1.5 km and was systematically narrowed down based on survey data to a 65 m corridor around each pipeline.

Merely surveying the seabed to plan the route and design the pipelines has involved contractors from eight countries and more than 80 different vessels. By the end of the project, more than 71,000 km will have been surveyed and more than 2,300 samples will have been collected to confirm the geology of the seabed. Additionally, more than 870,000 labour hours have been worked to find the best route for the pipeline and, in its conclusion, 150 TB of data will have been gathered.

By the end of the project, Nord Stream 2 will have spent an estimated €140 million (US$152.5 million) on survey works alone. To ensure a clear route, survey operations helped Nord Stream 2 engineers identify every detail of the seabed shape including: steep slopes; sediment types; rock outcrops; environmentally sensitive areas; cultural heritage and wrecks; cables and other infrastructure already there; and other items that would affect installation of the pipeline, from dumped cars to shipwrecks to unexploded ordnance.

Compared to the first Nord Stream project, which was completed in late 2011, the survey process moved much more swiftly for Nord Stream 2. Not only did the survey team benefit from the experience of working in the Baltic Sea, but data acquisition and analysis techniques improved significantly as equipment and survey vessels were developed and modernised.

For example, the project was able to build 3D models of the seabed and the objects it holds up to 20 m below the seabed. The surveys also identified the need for 70 cable and pipeline crossings, where gravel berms and concrete support mattresses would need to be strategically placed to support the pipeline in areas of high seabed relief.

Additionally, the surveys also showed the preferred route had shallow water areas, where pre-lay and/or post-lay trenching or rock placement activities would be required to embed sections of the pipeline into the seabed to increase stability and maintain the integrity of the pipeline.

During and after pipelay, post-construction surveys are carried out to check the pipeline has been laid along the agreed precisely defined route, as well as providing very high-quality data sets that will set the base line for the future operations team.

ENGINEERED FOR SAFETY

Using this survey data, Nord Stream 2 adopted and adapted many of the engineering solutions developed for the first Nord Stream, considering many of the Nord Stream 2 project team had worked on the previous project. Most notably, one such solution was the decision to dispense with interim compression: whereas onshore pipelines require interim compressor stations every few hundred kilometres, the gas will enter Nord Stream 2 at very high pressure (220 bar), which is enough to take it the entire 1,234 km to the German coast, where it will arrive at roughly 100 bar.

The pipeline has been designed and pipes manufactured with segmented pipe wall thicknesses along the route corresponding to decreasing pressures; starting at 220 bar in Russia, 200 bar in the middle section and 177.5 bar in the final section leading to the German landfall.

This is one of the factors determining the design of the pipes: each steel pipe is 12 m long and weighs 12 t, with an inner diameter of 48 inches (1,219.2 mm) and a varying wall thickness of up to 41 mm. Each pipe has internal flow coating and external corrosion protection coating.

The steel pipes are then coated with concrete to double their weight, further strengthening each pipe segment and adding to the stability of the pipeline on the seabed.

ENGINEERING SOLUTIONS FOR THE LANDFALLS

The two landfalls at either end of the pipeline presented different challenges, requiring different solutions. At the German landfall, Nord Stream 2 used two 700 m microtunnels to bring the pipeline out of the sea to the onshore section.
Whereas, for the Russian landfall, it developed a unique open-cut construction method using flooded trench-boxes and a powerful linear winch located half-way between the shore and the Pig Trap Area. The landfall in Russia is the start of the Nord Stream 2 pipeline and has been designed and constructed to take gas from Gazprom’s Slavyanskaya compressor station and send it through the pipeline to the German landfall. The compressor station and the pipeline are connected by four underground pipelines that are also operated by Gazprom.

The Russian landfall facilities are 3.8 km away from the shore. The landfall is equipped with all systems necessary to monitor the parameters of the incoming gas and ensure safe operations, including the pig traps and shut-down valves, as well as systems to monitor gas flow. At the other end of the pipeline, the gas will be delivered to the Nord Stream 2 German landfall facilities and thereafter the Gascade Receiving Station, which will be able to process more than 6.5 million m³ of natural gas per hour. An impressive interaction between valves, filters, preheaters and control equipment ensures high-quality natural gas flows at the right pressure, as the gas moves on into the German and European network.

The landfall facilities and receiving station at Landfall Germany spans nearly 12 hectares (120,000 m²) and has additional safety valves, filters, preheaters and pressure-reduction equipment. Both the pressure and the temperature of the gas fall during the lengthy transport to Lubmin, but dust must first be filtered out before it can be warmed by preheaters and a connected boiler plant.

Heat exchangers ensure the gas meets the desired temperature, as it cools drastically when the pressure is later reduced for transfer into the European transmission system.

The size and strength of the pipeline – combined with the high operating pressure – have required the engineering, production and installation of 28 complex large diameter valves. These were designed and manufactured in Italy and have been installed at the Russian and German landfall facilities, along with some smaller valves. The massive shut-down valves are up to the size of a small house.

Two consecutive safety valves separate the landfall facilities from the station’s measuring and control areas. The incoming and outgoing gas streams are checked here for quality, measured for custody transfer and precision-controlled for pressure and volume before being transferred to the next pipelines. Additional safety valves have been installed ahead of the EUGAL and NEL pipelines.

GREEN LOGISTICS

To ensure all the disparate elements of the project work seamlessly together, Nord Stream 2 adapted the award-winning ‘green logistics’ concept developed by the first Nord Stream project. With the objective of minimising environmental impact and maximising efficiency, the green logistics minimised the distance travelled from pipe mills to coating plants and from the storage yards to the pipelay vessels.

Nord Stream 2 used four hubs around the Baltic Sea: Mukran in Germany, Kotka and Hanko in Finland and Karlskrona in Sweden. Mukran and Kotka received the 12 m steel pipes and concrete-weight coated them to increase their weight to 24 t, then passed some on to the other two hubs – Hanko and Karlskrona – and stored the rest ready to be shipped out to the pipelay vessels, which laid both pipelines simultaneously and around the clock.

Loaded with more than 4,700 t of pipes, the pipe segments welded together aboard the vessel Castoro 10 were pulled ashore to the German landfall facilities by a high-performance winch through these 700 m long microtunnels. Connecting the Nord Stream 2 Pipeline to landfall facilities via tunnel limited the impact on sensitive areas and left existing infrastructure undisturbed above ground. Image courtesy of Nord Stream 2 and Axel Schmidt.

Once the ends were been welded together, the seam was ultrasonically tested and coated. The welded pipe string was then carefully placed in a slight arc on the Baltic Sea floor. Image courtesy of Nord Stream 2 and Axel Schmidt.

The ROV operates from the vessel Trio to explore the seabed close to Lubmin, Germany. During this nearshore survey work, the crew can carefully identify whether objects along the planned pipeline route need to be moved later. Image courtesy of Nord Stream 2 and Axel Schmidt.

The landfall for the Nord Stream 2 Pipeline is being constructed in Lubmin at an energy and technology site located west of an industrial harbour. Image courtesy of Nord Stream 2 and Axel Schmidt.
carrier vessels took 10 hours to reach Karlshamn from Mukran, and the trip from Kotka to Hanko approximately 10 to 12 hours, allowing for round-the-clock operations.

Unlike for the first Nord Stream – the two lines of which were laid one after the other and were connected to the landfall pipes by hyperbaric tie-ins – Nord Stream 2 had its two lines laid simultaneously and used above-water tie-ins (AWTIs) in both German and Russian waters.

The AWTIs were performed from laybarges. Lifting cranes, the davits, lift and hold the two pipeline sections above water with a line-up clamp during the welding together of the pipeline sections. Buoyancy devices are located on the pipeline to ensure the pipeline can be lifted safely above the water in preparation for the tie-in.

**UNIQUE ID FOR EVERY PIPE SEGMENT**

Given the scale and complexity of the project, with dozens of suppliers and contractors involved in delivering the pipeline, a major challenge was keeping track of the 200,000 pipes needed to construct it.

The solution was to develop a pipe tracking system (PTS) based on treating each pipe segment as a unique individual: every joint was given an identification number from birth at the pipe mill that remained the same throughout its journey, including every time it changed hands from one supplier to the next.

At any given time, Nord Stream 2 were able to know where each pipe was, together with its past and future movements. The use of hand-held electronic devices enabled easy scanning of the pipes to collect and transmit the data to the central database, enabling effective real-time control and decision-making, both now and in the future operational phase.

All elements of this state-of-the-art project have been engineered and are being implemented to the highest standard, so that the pipeline will be able to give Europe direct and reliable access to the world’s largest gas reserves in Russia for decades to come.

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**About the author**

Pavel Persidskii is Chief Technical Officer of Nord Stream 2 AG, the company set up to plan, construct and operate a new gas pipeline linking Russia to Europe. He was previously Deputy Chief Technical Officer, having joined the company in 2016. Mr Persidskii began his career in 2001, performing various engineering functions for Giprospetsgaz JSC, the main design company of PAO Gazprom, before becoming Chief Technical Officer for South Stream Serbia. He has been Chief Project Engineer on various Gazprom projects and holds a degree in economics and civil engineering from Volgograd State Academy of Architecture and Civil Engineering.
The construction of the Trans Adriatic Pipeline (TAP) commenced in 2016, with the project 93.5 per cent complete as of February 2020. The 878 km pipeline will cross Greece, Albania and the Adriatic Sea to Italy to bring Caspian natural gas to Europe.

The 93.5 completion percentage includes all engineering and procurement scope, in addition to progress on the 12 pipeline construction steps onshore, the construction of the block valve stations, compressor stations and pipeline receiving terminal as well as the offshore construction and pipeline installation.

Once finalised, TAP will offer a direct and cost-effective transportation route that will open the vital Southern Gas Corridor – a 3,500 km long gas value chain stretching from the Caspian Sea to Europe.

TAP ROUTE

TAP is an 878 km pipeline that will start near Kipoi on the border of Turkey and Greece and connect with the Trans Anatolian Natural Gas Pipeline (TANAP). From there, TAP will continue onshore and cross the entire territory of Northern Greece for its longest stretch.

The pipeline route will continue east to west through Albania to the Adriatic coast, where the offshore section will begin near Fier, Albania. TAP will then cross the Adriatic Sea to tie into Italy’s gas transportation network in the country’s south.

The 878 km length will be split between 550 km in Greece, 215 km in Albania, 105 km in the Adriatic Sea and 8 km in Italy. TAP’s highest elevation will be 2,100 m in the Albanian mountains and its lowest depth will be offshore, 820 m beneath the Adriatic Sea.

A 12-STEP CONSTRUCTION PLAN

In order to overcome challenging geographic conditions – including mountainous terrain and multiple river crossings – the project has employed innovative trenchless technologies. The methods were selected according to the unique geology of the sites, including horizontal directional drilling, microtunnelling, auger boring and pipe jacking.

Since the construction of a large gas pipeline is a complex job, many experienced contractors with
specialised teams are responsible for building the various sections of TAP over a 12-step process while using these trenchless methods.

The first three steps include environmental surveys to determine suitable construction techniques, followed by clearing a 38 m right of way (ROW) then stringing and bending the 48 inch (1,219 mm) steel pipes to match the route direction.

The fourth step for TAP is the pipe’s welding and subsequent automatic X-ray and ultrasound testing to ensure all pipes meet national and international standards. Once adequately tested, each weld is covered with a protective coating to prevent corrosion and be protected from mechanical impact.

During the sixth step, a trench is dug for the pipeline and the topsoil is placed separately for the reinstatement. Next, the welded pipe is lowered into the trench—generally in increments of 1 km or less—and then a tie-in is carried out where two lowered-in pipe strings are welded together in the trench.

The next three steps include placing soil around the pipe in the trench to act as padding to protect the pipeline, further testing of the pipeline’s integrity to be completed using hydrostatic testing and restoration of the ROW to its original state as much as possible to preserve environmental growth.

**ADDITIONAL CONSTRUCTION WORKS**

The Greek section of TAP will include a compressor station near Kipoi for 10 billion m³ and an additional station near Serres on the instance that TAP’s capacity is expanded. There will also be 22 block valve stations along the 550 km route in Greece.

In Albania, a compressor station will be built near Fier and a metering station will be built near Bilisht, while eight block valve stations and one
landfall station will also be built along the Albanian route. Should the pipeline capacity be expanded, the metering station near Bilisht will be turned into an additional compressor station.

As it approaches the coast of Italy through the Adriatic Sea, TAP will pass through a specially constructed 1.5 km microtunnel to enter land beneath the ground at a depth of 25 m. This will ensure the pipeline does not affect the local seagrass or the shore and will not be visible from the coast.

There will be a landfall station in the vicinity of the landfall and a pipeline receiving terminal (PRT) that will house TAP’s supervisory control centre in the municipality of Melendugno. The PRT will occupy 120,000 m² land and use electrical heaters to warm the gas and facilitate its flow, ensuring there will be zero emissions during normal operations.

**EXPANDABLE PIPELINE CAPACITY**

TAP’s developers integrated flexibility in its design to accommodate larger gas volumes as increased needs are anticipated in the future. The initial capacity of 10 billion m³ of gas per year is equivalent to the energy consumption of approximately 7 million European households.

In the future, the addition of the extra compression stations in Greece and Albania could double capacity to more than 20 billion m³ as additional energy supplies come on stream in the wider Caspian region.

TAP will also include a ‘physical reverse flow’ feature that will allow gas from Italy to be diverted to southeast Europe in the instance energy supplies are disrupted or more pipeline capacity is required to bring additional gas into the region.

**COMMUNITY ENGAGEMENT**

Through every stage of construction, TAP and its contractors engage with hundreds of local communities along the pipeline route in Greece, Albania and Italy through various events.

In early March, TAP hosted the 43rd Industry Advisory Panel (IAP) of the Energy Charter in Tirana, Albania. The event brought together several high-level representatives in the energy sector as well as energy companies, associations and members of diplomatic corps based in the country.

The discussions focused on the transition to a low-carbon energy system, the future role of energy infrastructure and both strategies and market rules for a climate-neutral energy sector. Many participants shared input about diversification of energy supplies in Europe.

TAP Managing Director Luca Schieppati highlighted the pipeline’s benefits to southeast Europe and the significant role natural gas infrastructure can play in achieving the goal of a carbon-neutral sector.

Mr Schieppati explained the natural gas provided and facilitated by TAP will support decarbonisation in southeast Europe where the energy sector is overly reliant on heavy fossil fuels for power generation.

The IAP is the expert consultative body to the Energy Charter Conference and provides policy advice from energy companies, international associations and financial institutions on energy investment.

For more information visit [www.tap-ag.com](http://www.tap-ag.com)
The Three Seas Initiative – launched in 2015 by Croatian President Kolinda Grabar-Kitarović and Polish President Andrzej Duda – takes its name from the Baltic, Black and Adriatic Seas that border the Central and Eastern European region. The program was conceived to promote connectivity among nations in this region through support of infrastructure, energy in support of infrastructure and energy projects.

The nations included in the initiative are Austria, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. In particular, the group wanted to create an energy and infrastructure corridor in the region and reduce reliance on Russian oil and gas.

In February 2020, US Secretary of State Mike Pompeo announced it would contribute $1 billion to support the Three Seas Initiative in a move that he says will help strengthen the country’s alliance with European allies.

“As a brand new statement today of our support for sovereignty, prosperity and energy independence of our European friends, today I want to announce that through the International Development Finance Corporation, and with the support of our United States Congress, we intend to provide up to $1 billion in financing to Central and Eastern European countries of the Three Seas Initiative,” says Mr Pompeo at a conference in Europe in February.

“Our aim is quite simple: it is to galvanise private sector investment in the energy sector to protect freedom and democracy around the world.”

In addition to decreasing reliance on Russia, the US also hopes supporting the Three Seas Initiative will promote the use of energy exports, both from the US and other countries. The money will be put into the Three Seas Investment Fund, which has also received more than €500 million (US$540 million) from initial funding institutions in Poland and Romania.

The fund will be used to unlock other alternate sources of funding, including from individual countries or the European Union (EU), which has shown support for the initiative.

It is aiming to raise up to €5 billion (US$5.4 billion) and will engage in infrastructure projects with a combined value of up to €100 billion (US$1.08 billion).

Some of the projects the initiative is looking to pursue include connecting new and prospective LNG terminals in Poland, Lithuania and Croatia to locations within the region, as well as the potential for connecting regional energy networks to the Trans Adriatic Pipeline.

Connection to other new gas reserves, including in the Black Sea, are also being analysed, along with other infrastructure projects such as water and transport.

For more information visit www.three-seas.eu
HIMOINSA supplies emergency power to BRUA

The BRUA pipeline – a direct natural gas transport route – will run through Romania in all four directions to connect the country to natural gas grids in Bulgaria, Hungary and Austria. Set to be one of the largest gas pipelines in southeast Europe, Romania has employed a HIMOINSA generator to guarantee safe and reliable power supply to the major project.

The Bulgaria-Romania-Hungary-Austria (BRUA) gas pipeline is part of the Three Seas Initiative (TSI) project, promoted by the European Union, whose objective is the economic development of the regions between the Baltic, Black and Adriatic Seas.

In the first phase of the project, the maximum transport capacity of approximately 1.5 billion m³ per year in the direction of Bulgaria and approximately 500 million m³ per year in the direction of Romania.

Due to ongoing gas exploration in the Black Sea – the project will be extended by a further 300 km to increase capacity in the distribution grid.

Natural gas fuel was chosen for the project to allow a direct connection of the gas pipeline to the general system, as well as offer a more profitable, efficient and environmentally sustainable solution.

HIMOINSA POWER GENERATOR

HIMOINSA will supply power to the pipeline project to ensure the transport of natural gas generated in the Black Sea, it is estimated to countries in southeast and central Europe. This supply will be carried out in association with All Generating – HIMOINSA’s Romanian distributor.

The project will use a natural gas powered HGM-740 T5 NG model to supply 741 kVA of emergency power to the facilities of the new pipeline. The generator is prepared as standby equipment in a gas compression station to respond promptly to any outage in the grid, ensuring the flow of piped gas and the safety of the installation are not affected.

Additionally, the generator has been installed in a 12 m long soundproofed container with a configuration specially adapted to work while connected to the gas system of the pipeline. To ensure low sound emission levels, a residential silencer has also been included in the configuration levels to alleviate emissions by 35 dB.

BRUA PIPELINE PROJECT

Developed by Transgaz – the technical operator of the national natural gas transmission system in Romania – the BRUA pipeline is 479 km with a 32 inch (810 mm) diameter. It will cross 79 administrative units in 11 counties and includes new gas compressor stations at Podișor, Bibești and Jupa in Romania.

Preparations of the project commenced in 2016 and the financing agreements for construction were signed in November 2017. Financing for the first phase was provided by a European Commission grant of €180 million (US$191.8 million), an investment loan from the European Investment Bank of €50 million (US$53.3 million) and a loan from the European Bank for Reconstruction and Development of €60 million (US$63.9 million).

The pipeline’s construction commenced in the first quarter of 2018 in three different sections. The general contractor of the first two sections is Austrian company Habau and the third section is contracted by Romania’s INSPET.

The first phase of the project became operational in 2019 and the second phase is anticipated to be operational by 2022, with total cost of the pipeline at an approximate €479 million (US$882 million).

The BRUA pipeline will eventually be linked to the Transgaz and Bulgartansgaz operated Giurgiu–Ruse pipeline and the Transgaz and MOL operated Arad–Szeged pipeline.

For more information visit www.himoinsa.com

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High-tech protection from corrosion

Mobiltex has launched the fourth generation of its CorTalk RMU1 remote monitoring technology and unveiled a powerful, new IoT-based CorTalk interruptible device – INT1 – designed to simplify data gathering and to protect critical infrastructure assets from corrosion.

Together, these Internet of Things (IoT) devices will enable utilities and pipeline operators to remotely perform interruption, obtain cathodic protection (CP) measurement data and dramatically reduce travel to remote locations to perform manual inspections and conduct measurements of CP systems. Savings could be most significant for CP operators with critical bonds, which require measurements to be taken up to six times per year.

The compact RMU1 G4 device adds two-way communication to enhance its robust CP remote monitoring capabilities of coupons, test points and structure bond applications. This new feature also enables the RMU1 to receive commands and to control the new INT1 device for GPS-synchronised interruption.

“The enhanced RMU1 and new INT1 are game changing devices to help reduce operational costs with cloud-based monitoring and control of CP systems. For the first time, field technicians can easily combine remote monitoring of CP systems and interruption of bonds and anodes into a compact, powerful package that fits entirely within a test point station,” says Mobiltex CEO Marc Bracken.

“These latest advancements will enable Mobiltex to continue its rapid growth with best-in-class devices that provide our clients with superior reliability, ease of installation and increased operational efficiency.”

**INSTALLATION AND PAIRING PROCESSE**

Both the RMU1 and INT1 can be installed into a CP test station within minutes and are powered by a long-life battery that provides up to 10 years of continuous operation. The INT1 interrupter accessory can be added at any time and is quickly connected to the RMU1 with a single cable.

Once connected, the INT1 automatically pairs with the RMU1 and can remain permanently installed, eliminating the need for technicians to install portable interrupters or to physically break bonds between pipelines and structures to take off-potential readings.

Technicians can easily access the RMU1 and INT1 devices from any web-enabled device, such as a mobile phone, tablet or desktop computer, to configure the interruption process, view performance data and generate reports.

When not performing interruption, RMU1 devices reliably transmit CP performance data as frequently as every few hours via satellite or cellular network to the Mobiltex CorView analytics platform. If the CP system experiences an outage or measurements are not within a set range of parameters, the RMU1 triggers a notification to the operators.

This regular data collection can also help operators identify short-lived events that may impact CP performance, such as power load transfers or faults. These intermittent issues are often not identified through annual or semi-annual site inspections and can leave pipelines vulnerable to corrosion.

For more information visit www.mobiltex.com
ENTEGRA expands global fleet of technology

ENTEGRA® Global – a portfolio company of Intervale Capital – is expanding its range of ILI tools with a new Cathodic Protection Current Mapping (CPCM) technology, powered by a worldwide licensing agreement with Shell.

The new Cathodic Protection Current Mapping (CPCM) inline inspection (ILI) technology provides a pigging solution for assessing a pipeline’s cathodic protection (CP) system’s effectiveness. The tool locates, identifies, measures and reports all CP current sources, leaks, interferences and gaps from inside the pipe – including difficult to access areas – while the pipeline remains in service.

CUSTOMER-FOCUSED DEVELOPMENT

ENTEGRA CEO Mark Olson says the company has been quietly working on this opportunity for a while.

“It’s a unique opportunity to deploy an otherwise unavailable, important and necessary new inline inspection technology,” he says.

“Our customers’ mandate is to ‘know your pipeline’. Our new technology fits perfectly with this objective and reflects ENTEGRA’s core values as well as our existing ultra-high-resolution magnetic flux leakage/caliper combination (MFL/CAL) ILI service, as we endeavour to tell the most complete story about the integrity of our customers’ pipeline systems and facilities.”

ENGINEERED TO COMPLEMENT

The CPCM ILI system has been engineered to complement ENTEGRA’s ever-growing fleet of innovative smart pigging tools and the company’s evolutionary data science operations.

ENTEGRA Global Director of Sales and Marketing Aaron Crowder says the CPCM ILI technology is engineered to fit perfectly with the company’s existing portfolio and service platform.

“We are working with pipeline owners and operators around the globe to better protect their new and existing assets, which ultimately protect people and our environment,” says Mr Crowder.

The ENTEGRA team has been instrumental in the development and evolution of ILI with new innovative tools and technologies at the heart of the company’s mission. ENTEGRA says it aims to optimise ILI for pipeline industry stakeholders while serving as responsible industry partners and environmental stewards.

INTERVALE CAPITAL

Intervale Capital invests in and builds market leaders throughout the energy and infrastructure products and services sector. Operating from offices in Houston and Boston, the firm has raised US$1.3 billion in committed capital since its inception in 2006.

Intervale portfolio companies – in addition to ENTEGRA – include Innovex Downhole Solutions, Milestone Environmental Services, Enercorp Sand Solutions, Taurex Drill Bits, Aegis Chemical Solutions and more.

About ENTEGRA

ENTEGRA is a global pipeline inspection company specialising in UHR technologies. The service provider serves upstream, midstream and downstream oil and gas markets and delivers a complete assessment of a pipeline’s condition. ENTEGRA redefines industry standards by developing and deploying an extensive fleet of UHR MFL, CAL and Mapping combination tools.

For more information visit www.entegasolutions.com
Pipeline installation options in Colombia have expanded with the construction of the first trenchless boring machine by two Venezuelan-born engineers. At the Colombian Institute for Subterranean Infrastructure Technologies and Techniques’ 10th Anniversary Gala Dinner, the Zillante brothers were awarded for the innovative technology.

Daniel and Roberto Zillante were raised in Venezuela by a family of hard-working Italian immigrants who had worked in construction all their lives. Since the age of seven, the brothers have spent time visiting work sites and developed a strong passion for the industry. Years later, the brothers earned engineering and business Master’s degrees that helped them co found Zilper Trenchless.

“Engineering and building things have been a passion for both of us since we were kids. We still remember the times when we used to get together to build R/C airplanes, small cars and anything else that you can think of. I think that passion is what inspired us to study engineering,” says Daniel Zillante.

Daniel is a Production Engineer with an MBA from MIT Sloan (USA), while Roberto is a Mechanical Engineer with a Master in Management Engineering from Politecnico di Torino (Italy).

A COMBINED PASSION FOR TRENCHLESS

The Zillante brothers say a combination of their passions for engineering and business, along with witnessing, firsthand, the need for more versatile and cost-effective trenchless technology, is what primarily drove the start of the business.

After working in the industry as a trenchless contractor, it became evident that many current machines were limited in versatility regarding pipe diameter, drive length, geology and grade precision – therefore limiting the number of projects that trenchless contractors could tackle cost effectively.

The Zillante brothers say, as a result of these limitations, they decided to cofound Zilper Trenchless and develop a new technology that could provide more versatility along with high grade accuracy at a low cost.

“Our vision was to create cost-effective technology that allows us to compete in projects where open-cut was the go-to solution. As we achieve our vision, we will help the world upgrade its decaying underground water infrastructure at a fraction of the cost – meaning better infrastructure, deployed faster than ever before,” says Daniel Zillante.

ASSISTED DYNAMIC BORING TECHNOLOGY

The Zilper Trenchless Assisted Dynamic Boring (ADB) technology will install and steer metal casings up to 72 inches (1,829 mm) and tackle the same geology as pipe ramming technology, without the length and precision limitations.

Even though Zilper Trenchless’ ADB system was inspired by pipe rammers, the ADB installation lengths are not as affected by larger diameters and complicated geologies as rammers are. Additionally, Zilper’s technology is capable of steering pipes and does not require additional systems to clear dirt from inside the casings.

“Our technology offers all the advantages that a traditional pipe ramming system offers but without its disadvantages. As any rammer, we install our casings by pushing and ramming from the entry pit,” says Roberto Zillante.

“We don’t use a rotating cutting head to excavate the ground so we are less sensitive to ground conditions and don’t suffer the relevant reductions in drive lengths that a pipe rammer experiences when installing bigger casings or complicated geologies. Additionally, we are able to steer the pipe to keep it on grade and we can clear the dirt from the inside of the casing with our same equipment.”
Due to Zilper Trenchless’ underlying technology, the machine is very energy-efficient which enables small hydraulic systems and small ramblers. As a result, the construction of a very affordable machine that can handle a wide range of projects was made possible.

“The maximum drive length that we can reach is a function of the geology and casing diameter. Depending on the combination of those factors, we can install anywhere from 80 to 180 m in a single drive,” say the Zillante brothers.

“As is the case with rammers, we cannot install through solid rock. Nonetheless, we have completed successful drives through cobblestone and boulders.”

Additionally, the guidance system can currently achieve up to 0.5 per cent grade accuracy; however, later this year, Zilper Trenchless plans to launch a new system that will further improve its accuracy while simultaneously simplifying its operation – part of its overall goal to match best-in-class accuracy by 2022.

GROWING THE TRENCHLESS MARKET

The ADB market is currently dominated by auger boring, guided boring machines and pipe ramblers. Daniel Zillante explains Zilper Trenchless’ focus is not to take market share from other technologies, but to focus on competing against open-cut excavation and growing the total market for trenchless projects.

The brothers explain that this is already happening in Colombia where trenchless technology is fast-growing in popularity.

“We just finished a stormwater project that had five drives totalling approximately 400 m of metal casing in three diameters [being] 30, 36 and 42 inches (762, 914 and 1,067 mm). We are about to start a new project and there are four more planned over the next few months,” says Roberto Zillante.

“By the end of this year, we expect to have used our technology to install at least eight diameters, ranging from 12 inches to 48 inches (305 to 1,219 mm) with a single machine, without any significant investment on downhole tools or parts.”

MANUFACTURING PROCESS

The ADB technology has been in development for more than two years. During this time, the company designed nine full versions of the machine on computers prior to manufacturing the full-scale commercial design.

These computer simulations allowed Zilper Trenchless to stress-test the designs before manufacturing could commence – a process that took more than a year. Roberto Zillante says while the manufacturing of this first commercial design took close to five months, the next design will be complete in only two months.

In terms of supply, most parts for the machine were manufactured in local shops around Bogota, Colombia. In addition, some components were sourced from Europe and the US to meet the specifications for the cutting-edge product.

A COLLABORATIVE APPROACH

The Zillantes say, owed to the hard work of Zilper Trenchless’ team and partners, they are now developing technologies that will positively impact the trenchless industry for decades to come.

“Even though many people don’t know this, we are a company that started out of Massachusetts Institute of Technology (MIT), in Cambridge, MA in the USA. MIT – and its entrepreneurial ecosystem, students and professors – have played a significant role in our journey,” says Daniel Zillante.

“My people have helped us build our company and our machines. Mentors, advisors and investors played a key role. We would not be here without them.

“We also have to thank Aqua Ingenieros SAS, a trenchless contractor in Colombia who believed in what we are building and became our first customer. They have been a tremendous thought partner and see great potential in our trenchless innovations.”

ICTIS AWARDS

The Zillante brothers received two awards during the Institute for Subterranean Infrastructure Technologies and Techniques 10th Anniversary Gala Dinner last year.

The first was titled Best New Trenchless Equipment 2019 and it was awarded in recognition of the versatility and cost-effectiveness of the ADB machine, while the second award was titled Best Trenchless Innovator 2019 and was given to Daniel and Roberto themselves, as founders, for their contributions in industry innovation.

“We created our company to fundamentally change the economics of upgrading underground pipeline infrastructure. In order to do so, we will keep innovating on technology and business models to accelerate the adoption of trenchless technologies,” says Daniel Zillante.
Building a global safety net

by Sophie Venz, Journalist, Great Southern Press

The global pipeline industry is consistently working to improve safety in its operations through the creation of standards with regulators, establishing international forums to share best practices and employing innovative technologies.

Across the globe, pipeline operators, associations and product manufacturers have been developing protocols over the past decade to work towards creating a safer industry. While varying approaches to achieve such a goal are taking place, the universal aim of a ‘zero-incident’ industry that will create a safer environment for contractors, operators and surrounding communities is a driving force for all.

UNITED STATES

Across the US, the Pipeline and Hazardous Materials Safety Administration (PHMSA) has long been working towards a safety goal of zero pipeline incidents, based on three fundamental actions of establishing and enforcing regulations, ensuring operators understand pipeline associated risks and encouraging improved safety performance beyond minimum compliance.

In addition to the PHMSA enforced regulations and standards, the American Petroleum Institute (API) developed a framework in 2015 for Pipeline Safety Management System (SMS), designed specifically for pipeline operators.

Pipeline SMS helps operators understand, manage and continuously improve their safety efforts by recognising that operators and companies are at different stages of maturity and subsequently require a flexible road map and suite of tools to be adequately supported.

UNITED KINGDOM

Formed in 1996, the United Kingdom Offshore Pipeline Association (UKOPA) exists as the authoritative view for UK pipeline operations, considering strategic issues relating to safety and integrity management of pipelines. In 2014, the association began publishing good practice guides discussing topics such as emergency response plans, safety management...
and hazard distances. In 2015, UKOPA undertook a strategic review to identify its goals and the benefits it aimed to provide by 2020.

Now, the association has achieved these goals and continues to develop the benefits offered to its member companies, including through members’ meetings, the good practice documents and its subsidiary working groups that cover pipeline safety, data and risk assessment and pipeline integrity.

EUROPE
Nations in the European Union must follow gas network codes administrated by the European Commission. Each year, the commission creates an ‘annual priority list’, including ideas to be integrated into the network code developments such as safety measurements and testing.

Additionally, the European Pipeline Research Group (EPRG) was established as a registered association in 2005 for European pipe manufacturers, pipeline operators, installation contractors and service providers active in the pipeline safety field.

EPRG conducts research and assessments to create publications, recommendations and guidelines – based on the collative expertise of specialists from varying disciplines – to educate European operators on safe practices.

AUSTRALASIA
The Australian Pipeline and Gas Association (APGA) has been the peak body representing Australasia’s pipeline infrastructure since 1998. While natural gas transmission pipelines in the region have a longstanding safety record, practices are continuously being implemented and developed to continue this reputation.

A working group of industry and government members developed and released the Australian Standard 2885 – Gas and Liquid Petroleum (AS 2885) to underpin the design, construction, testing, operations and maintenance of gas transmission pipelines in 2008.

Since then, APGA members have continued to actively participate in its design, review and development. APGA’s Research and Standards Committee was a partner in the Energy Pipelines Cooperative Research Centre – running from 2009 to 2019 – which undertook research in efficient use of materials, extension of safe operating life capacity, advanced design and construction and public safety of supply.

GLOBAL INITIATIVES
PHSMA’s Howard “Skip” Elliot says he believes applying new technologies is essential in the pursuit of the ‘zero incident’ goal, a belief mirrored by other associations and organisations around the world.

Many individual companies have taken it upon themselves to create safer industry practices through the development, manufacturing and supplying of innovative technology used on installation, maintenance, repair and operational projects across the globe.

TECHNOLOGICAL ADVANCES
In addition to focusing on new developments, many suppliers are reviewing and improving existing products due to the technological advances of the modern age. Over the past 10 years, safety measures for pipelines have seen an increase due to more accurate, reliable and efficient data being available.

For many decades, pigging has been a popular industry practice for maintenance and cleaning works. Now, ‘smart’ or ‘intelligent’ pigs have been developed to inspect pipelines for the purpose of preventing leaks.

These modern pigs include electronics and sensors that collect data while travelling through the pipeline. This technology and its complexity can vary depending on the intended use of the manufacturer and the service provider’s offering, but ranges from surface pitting and corrosion inspection to weld defect and crack analysis using magnetic flux leakage pigs.

CCTV is another sector of inspection technology that has rapidly developed over the past decade, with CCTV now being installed in robotics for pipe inspections in difficult to reach areas. Owed to global improvements in technology, the accessibility by a camera and the quality of the subsequent footage, this method can offer far greater, more accurate inspections of pipelines.

With companies utilising innovative technologies, regulators developing safety standards and associations providing clear resources to improve pipeline construction, management and operations across the globe, the goal of zero incidents now seems more accessible and achievable than ever before.
Maximising as a manufacturer

Pigs Unlimited understands building and supporting partnerships with distributors is the key to successfully securing sales worldwide. The company says distributors are imperative in helping its business penetrate new markets and expand geographically, which is why it focuses on maximising its manufacturer-distributor relationships.

As a manufacturer, having products in hand for distributors is paramount as supply is what drives sales to one brand or another. Global partners who stock items and products are an essential asset for Pigs Unlimited International’s market, along with its selection of inventory available for immediate shipping.

MANUFACTURING FACILITY

Pigs Unlimited large manufacturing facility allows for many products to remain in stock for a quick turnaround to distributors. Located just north of Houston, Texas, products can easily be distributed to both air and sea ports.

The facility’s location is also convenient for shipping across the US making logistical shipping options truly unlimited. However, the company aims to keep its costs to a minimum to ensure its distributors get the best possible pricing without sacrificing on the quality of its product.

Within the past two years, Pigs Unlimited has invested in new machines to improve safety in the manufacturing process and secure a more consistent and top of the line product.

RELATIONSHIP FOUNDATIONS

Pigs Unlimited International Director of Marketing Ashley Murray says the company understands distributors are not merely a customer, but also a partner.

“Honesty and integrity is the foundation of the distributor relationship, we understand and acknowledge that distributors are the key to getting our products to customers,” says Ms Murray.

“We offer product support questions and answers to find solutions to the individual circumstance since every line is unique. Our goal is always to get a response quickly, within 24 hours – if not sooner – because we understand the urgency in this industry.”

A common goal between manufacturers and distributors is market leadership and profitability. To reach this goal, Pigs Unlimited and its partners practise strong communication, along with quality products and availability, making these focuses the cornerstone of the business.

About Pigs Unlimited International

Founded in 1995, Pigs Unlimited International began with the intent of providing customers with an all-inclusive line of pigging products. Now, Pigs Unlimited International currently manufactures all styles of pigs – foam, steel and solid-cast – as well as spare components including cups, discs and brushes. The company’s main goal remains providing its customers with the most complete line of pigging products, which is accomplished by maintaining full pig manufacturing capabilities and maintaining relationships with industry leading pigging product vendors around the world.

For more information visit www.pigsunlimited.com
With thousands of attendees through the door, February 2020’s edition of the Pipeline Pigging and Integrity Management (PPIM) Conference in Houston, US was a great opportunity for companies in the sector to showcase its offerings to peers and potential business partners in the industry.

A well-established name operating out of Oklahoma, US, Enduro Pipeline Services offers a range of services and products including inline inspection, pipeline cleaning, tracking equipment and project management services for the pipeline industry.

As has come to be expected, Enduro had one of the most eye-catching exhibitor stands in the exhibition hall and a large cohort of staff on hand to speak with any and all interested parties about the company’s high quality pigging services and tools.

Front and centre were some of Enduro’s most popular products, including the Wireless Geophone and the Non-Intrusive Pig Sensor (NIPS) Unit, with sought-after Enduro apparel that pipeliner’s love to add to their wardrobe.

NIPS is a pig sensor that detects a change in the magnetic field as a pig is run through a pipeline and passes under the unit. The product is used most often at launchers, receivers and valve sites where pipe is exposed.

The system includes the NIPS unit, two sets of lithium CR123 batteries, an instruction card and a high-impact, O-ring sealed watertight carry case. Each NIPS is equipped with a strong rare earth magnet on the base that attaches directly to the pipe.

Another popular product for Enduro customers, the Wireless Geophone detects pig movement by sound amplification of normal noises created by pig passage. The unit can be placed on the ground or attached to exposing piping such as valve settings or vent pipes and includes features such as volume control, rechargeable headset and up to 30 hours of operation when charged.

A range of transmitter models are available to purchase at Enduro’s new online store and can be mounted on Enduro’s cleaning pigs, as well as other industry pigs. The transmitters are designed with a pulse frequency switch that allows crews to track two or more pigs at the same time, while being able to differentiate between transmitters.

Enduro continues to impress the market through the quality of both its products and customer service, all the while sticking to a goal of consistent improvement and modification to achieve the best results possible.

Enduro Pipeline Services once again made the most of the interest of the large crowd at PPIM 2020, showing off its state-of-the-art range of pigging and inspection services and equipment.

About Enduro Pipeline Services
A leader in the pipeline services industry, Enduro takes a progressive and innovative approach to business, people management and service to the pipeline community. With global headquarters in the US in Tulsa, Oklahoma and an additional office in Calgary, Canada, Enduro’s reach in the industry stretches far and wide and is a name synonymous with quality products.

For more information visit www.enduropls.com
One way to decarbonise our future is investing in the hydrogen economy, as the only byproducts of hydrogen power are water and heat. The availability of hydrogen is unlimited, and a hydrogen-fueled energy infrastructure can be locally produced, meaning countries can power themselves independently without having to rely on external energy suppliers.

Hydrogen can be extracted from a wide range of substances, including oil, gas, biofuels, sewage sludge and water. The cleanest way to produce hydrogen is to extract it from water through electrolysis, which requires electricity.

For the process to be truly green, this electricity must be produced with renewable energy. This is where the loop closes; since hydrogen is a reliable and efficient energy carrier, it potentially solves the biggest challenge currently faced by renewable energy: its storage and transportation.

Therefore, replacing fossil fuels with hydrogen produced by renewable energy would enable completely carbon-free power generation.

A report from the International Energy Agency – requested by Japan under its G20 presidency – found that “clean hydrogen is currently enjoying unprecedented political and business momentum, with the number of policies and projects around the world expanding rapidly.” However, less than 0.1 per cent of global hydrogen production today uses water electrolysis.

Natural gas is still the main source by far, providing three quarters of the current 70 million t of hydrogen worldwide.

The US alone produces 10 million t of hydrogen each year, with approximately 2,574 km of hydrogen pipelines operating in the country. Research currently focuses on solving challenges related to pipeline conversion as using existing gas infrastructure offers ideal conditions for storing, transporting and distributing increasing amounts of hydrogen.

However, this requires significant modifications to the pipelines due to the physical and chemical properties of hydrogen. Hydrogen is very small and mobile, which enables it to permeate various materials, including plastic and steel.

This may lead not only to leaks of much higher volume than with natural gas, but also to the embrittlement of pipe material, thus speeding up cracking of the pipeline walls. To prevent this from happening, hydrogen pipelines must be subject to thorough and rigorous integrity management.

The pipeline industry has been taking close note of the increased demand for hydrogen – and the accompanying requirement for hydrogen transport pipelines – over the last decade. However, there are currently very limited inline inspection options that do not require taking these lines out of service or the use of nitrogen, which can be costly for operators.

A CASE STUDY

A 19 km pipeline segment, 10 inches (254 mm) in diameter and installed in 1996, was set up for the transport of hydrogen. When this line segment was initially inspected by a smart tool, the industry was not prepared to run their tools in such explosive environments.

The only way to inspect hydrogen pipelines was by utilising water as a propellant; however, this process comes at a high cost to the operator and can be quite time consuming, as it requires the line be taken out of service for the inspection and the necessary drying process.

As the industry gained a better understanding of the requirements for these environments, the operators pushed for more cost-effective solutions.

TOOL SETUP FOR HYDROGEN

In 2015, the operator approached ROSEN for a method to safely inspect the line segment with a combination of geometry and magnetic flux leakage (MFL) technologies. The following
measures allowed ROSEN to successfully complete the requested inspection in January 2017 and again in 2019.

For any inspection conducted in an explosive atmosphere, tools are set up in compliance with the European Union's ATEX directives. This allows for a considerable reduction of risk in such a project by preventing the occurrence of sparks within the tool, providing a flameproof enclosure for the components, having a pressurised enclosure for the electronics and utilising intrinsic safety with voltage-restricted electrical circuits.

Due to the harsh product, the tool was set up with non-standard cups, differing in shore – meaning hardness. The cups are designed to lower the risk of static electricity, resist decomposition and allow for proper resistance to uneven wear. For the standard tool set up, a minimum of 435 psi is typically requested. However, this was not something the operator would be able to provide while propelling with the product.

Instead, the team was required to move forward with a pressure of ~270 psi and a flow rate of 11 MMscfd for the first inspection. In order to reduce excessive velocity from pressure build-up in installations while still providing enough seal to propel the tool through the line, various bypass holes and notches were applied to the design.

Finally, protective measures for the magnet circuits were taken. Hydrogen can be extremely damaging to magnets and the impairment of the magnet circuit may lead to lowered levels of magnetisation of the pipe wall, thereby reducing data quality.

FIRST INSPECTION IN 2017

Once the tool was extracted, there was no damage to the tool or its components, and the cups showed minimal wear. The resulting data from the combination tool showed 100 per cent sensor coverage for both the geometry and MFL portions, and magnetisation levels were within the predicted ranges.

While the tool did experience a few spikes in velocity when traversing installation areas, the overall data quality was acceptable for evaluation.

REINSPECTION IN 2019

Given the success of the first inspection, the operator returned to ROSEN when it was time to reinspect the line segment in 2019. This time, it was able to provide a pressure of ~340 psi while maintaining the same flow rate.

Due to the successful outcome of the previous inspection, the same tool configuration was chosen for the reinspection. Once again, the cups showed minimal wear, and the tool was generally in good condition.

However, during this inspection, the combination tool did acquire some damage. The damage was determined to be the result of the higher-than-usual velocity while coming into the receiver and hitting the door of the trap.

No electronic connection could be established with the tool on-site; however, the data could be extracted without difficulty at the maintenance workshop.

During the data review, it was noted that the tool still experienced a few velocity spikes in installation areas, but the increased pressure allowed for an overall reduced speed and a more stable inspection of the line segment. The data was again at 100 per cent sensor coverage for both the geometry and MFL portions and was acceptable for evaluation.

A HOLISTIC APPROACH FOR SUSTAINABLE DECISION-MAKING

Service providers must support pipeline operators in the process of change in order to extend the lifetime of valuable assets beyond the decarbonisation of the energy system. Besides adapting existing technologies and services to the special requirements of a hydrogen grid, this means for ROSEN that all service offerings for hydrogen assets are integrated into a holistic integrity management framework that addresses hydrogen-related threats, interactions and defects.

With this integrated approach, risk reduction is provided for the injection of hydrogen into an existing network of gas pipelines. Pipeline operators are then able to make sustainable decisions for the conversion of their existing gas grids to hydrogen, ensuring hydrogen transport operations that are reliable in all aspects of performance, safety and security.

For more information visit www.rosen-group.com
The hype about hydrogen

by David Convery, Managing Editor, Great Southern Press

With hydrogen continuing to build momentum as a green addition to the world’s energy mix, Pipelines International takes a look at how its story is unfolding around the world and some of the projects at the forefront of this new energy push.

The hype around hydrogen is simple – it’s a powerful, clean energy source that can potentially be stored in existing gas networks and is highly valued by many of the same consumers as LNG. Hydrogen is something the industry has had its eyes on it for a long time, but now things are finally getting down to serious business.

Public sentiment towards fossil fuels, a continually expanding focus on renewables and a desire to shift to something with strong economic promise has pushed hydrogen to the forefront of the industry, gaining more support seemingly with each passing month.

INTERNATIONAL COUNCIL

Launched in 2017, the Hydrogen Council is a global initiative of energy, transport and industry companies looking to facilitate the growth of hydrogen around the world. A growing coalition of CEOs, the council boasts members including Equinor, Chevron, Saudi Aramco, Siemens and McDermott with today’s alliance of companies collectively representing more than US$20.8 trillion.

While the introduction of new energy sources is always costly and critics of hydrogen have often cited the high price tag placed on its production and potential implementation, a recent report from the Hydrogen Council argued these costs will fall dramatically within the next decade.

The council conducted an industry study based on 25,000 data points gathered and analysed from 30 companies representing the entire hydrogen value chain across the US, Europe, Japan, Korea and China. The report predicted a strong fall in the cost of producing low carbon and renewable hydrogen, lower distribution and refuelling costs due to higher load utilisation and a dramatic drop in the cost of components for end-use equipment under scaling up of manufacturing.

“2020 marks the beginning of a new era for energy; as the potential for hydrogen to become part of our global energy system becomes a reality, we can expect fewer emissions and improved security and flexibility. This announces the decade of hydrogen,” says Air Liquide Chair and CEO and Hydrogen Council Co-Chair Benoît Potier.

“A clean energy future with hydrogen is closer than we think, because the industry has been working hard on addressing key technology challenges. This report shows the path forward to scale-up to fully achieve hydrogen competitiveness and deliver the decarbonisation we urgently need.”

The report contended several of the hydrogen solutions analysed could become cost competitive before 2030, including in industries such as steel, heating and transport.

GREEN NETWORK IN GERMANY

In Germany, BP, Evonik, Nowega, OGE and RWE Generation have signed a Memorandum of Understanding (MoU) to develop the GET H2 Nucleus project which will supply green hydrogen produced from wind and solar to industrial companies in Lower Saxony and North Rhine-Westphalia.

Hydrogen will be produced using a 100 MW electrolyser in Lingen, Lower Saxony and transported to customers and refineries in Lingen, Marl and Gelsenkirchen – mainly via the existing gas pipelines – which will be converted to transport 100 per cent hydrogen, but also via a partially new construction.

The joint venture (JV) says building up a hydrogen infrastructure based on the existing gas infrastructure will guarantee industrial customers the security of supplies which they are dependent upon. In the longer term, existing cavern storage facilities along the hydrogen pipeline are to be incorporated, which will further increase this security of supplies.

If all goes to plan, the network will begin the production and supply of green hydrogen by the end of 2022. The project partners said they are paving the way for a sustainable national hydrogen
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sector and a leading technological role for Germany.

The JV says it is important for German politicians to create the necessary legal conditions to enable all companies involved in hydrogen projects to rapidly expand production and construction of necessary infrastructure.

AUSTRALIAN STRATEGY

In Australia in November 2019, after nearly 12 months of development, the Council of Australian Governments (COAG) Energy Council released Australia’s National Hydrogen Strategy. Devised by COAG’s Hydrogen Working Group, chaired by Australia’s Chief Scientist Dr Alan Finkel, the strategy provides a plan for Australian governments and industry to grow the country’s hydrogen sector and turn the energy source into a major export by 2030.

The strategy was created through analysis and consultation with industry experts, the public and government officials and includes an extensive portion of original research. While the council intends for the strategy to be continually modified and updated as the industry progresses, at the time of its release Dr Finkel said the key stakeholders were ready to put things into action.

“The potential to export clean hydrogen is substantial, with the International Energy Agency and the World Energy Council both identifying Australia as a potential hydrogen production powerhouse,” says Dr Finkel.

The Australian Pipelines and Gas Association (APGA) has shown great support to try to get hydrogen off the ground by working closely with initiatives like the Future Fuels CRC, who are continuing to develop new hydrogen technologies in an attempt to make the fuel a serious player in Australia’s energy mix. Multiple gas companies are exploring the possibility of blending hydrogen into their grids, which can both help store excess renewable energy and lower the carbon footprint of gas assets.

In May 2019, a report released by Energy Networks Australia confirmed that this kind of activity in the gas networks was permitted under law.

In New South Wales, Jemena has purchased a 500 kW electrolyser for its Western Sydney Green Gas Project – a AU$15 million (US$8.6 million) trial co-funded by the Australian Renewable Energy Agency that will produce hydrogen for use in Jemena’s NSW gas network. Another major operator, Australian Gas Infrastructure Group (AGIG), is on a similar path in South Australia through its Australian Gas Networks (AGN) arm, having officially begun construction of its Hydrogen Park SA (HyP SA) in an area south of Adelaide in December 2019.

“At HyP SA we will be building a 1.25 MW electrolyser as the first Australian demonstration project of its scale and size, with small quantities of renewable hydrogen produced and blended into the local gas distribution network next year,” says AGIG CEO Ben Wilson.

“Commercial hydrogen production is achievable and can decarbonise Australia’s energy mix while at the same time accessing export markets.”

The first customers to receive the gas in Adelaide will receive a blend of 5 per cent, but the company says it intends to eventually deliver 100 per cent renewable gas.

AGIG is also undertaking a study in Western Australia (WA) to assess the possibility of introducing hydrogen into the feedstock mix in the Dampier to Bunbury Natural Gas Pipeline (DBP). Making use of the 1,600 km pipeline, the initiative is major step up in terms of scale when it comes to blending hydrogen, with the WA Government to provide AUS$216,000 (US$124,500) of funding for the study while AGIG will put up a further AUS$234,000 (US$135,000).

WA’s Peel, Pilbara and Mid-West regional precincts are to be the focus of the study, along with the capital’s metropolitan area, and Mr Wilson says the company has a responsibility to decarbonise natural gas assets.

“Project developers have already approached AGIG requesting to blend hydrogen into our pipeline,” says Mr Wilson.

“AGIG generally supports these projects but we must only proceed in a manner that ensures public safety is maintained, and there is currently no predefined method of introducing hydrogen into such large-scale assets as the Dampier to Bunbury
HYDROGEN

link. AGIG is prepared to invest therefore in a number of studies to determine the best manner of introducing hydrogen into the DBP.”

The feasibility study is expected to be completed in June 2021.

Elsewhere in WA, energy infrastructure operator ATCO announced in late December 2019 it had begun successfully blending renewable hydrogen into the gas network at its AU$3.6 million (US$2.08 million) Clean Energy Innovation Hub in Jandakot. The blend has been used in gas appliances on site including cooktops and air conditioners, and ATCO is also using the development to examine the role hydrogen could play in hybrid microgrids.

ATCO has also benefited from ARENA funding, receiving a total of AU$1.6 million (US$922,700).

EXPORTS AND NEW TECH

Like oil and LNG before it, one of the attractive characteristics of a successful hydrogen industry is its potential as an exportable energy source. Countries such as China, South Korea and Japan in particular, who are some of the world’s largest LNG importers at present, have expressed particular interest in starting to import hydrogen.

A AU$400–500 million (US$231–288 million) project is underway at the Port of Hastings, Victoria to convert hydrogen gas made from brown coal into liquified hydrogen for export from Australia to Japan. Kawasaki Heavy Industries is spearheading the project, known as the Hydrogen Energy Supply Chain (HESC) pilot project, which has received AU$50 million (US$28.8 million) from each of the state and federal governments in funding and has a consortium of partners including Electric Power Development, J-Power Latrobe Valley, Iwatani Corporation, Marubeni Corporation and AGL Loy Yang.

The project has attracted criticism for its use of brown coal with concerns over the scale of emissions it could produce if it proceeds past the pilot stage. Nevertheless, Australia’s Environmental Protection Authority gave the project the green light arguing the current works were about demonstrating that the process, including the hydrogen shipping aspect, could work. Operations are set to begin in late 2020 or early 2021.

ENGIE is another company consistently investing in hydrogen, who by its own admission is looking to become a “major player” in the field. The company has experimented with the refuelling and operations of a hydrogen passenger train in the Netherlands, invested in a new hydrogen production, transport and storage technology initiative in Bilbao, Spain, and a renewable hydrogen and ammonia production facility in WA.

Whether the energy source can and will become the multibillion-dollar green energy juggernaut its propagators hope it will remains to be seen, but with so much money, time and effort now being concentrated in hydrogen’s direction, the answer might become apparent sooner than first thought.
New pipeline helps unlock natural gas in Argentina

TGS has completed the construction of a major gas infrastructure project that will allow natural gas from a major non-conventional resource to be delivered to customers throughout Argentina.

Despite the world containing 46 countries with non-conventional natural gas resources, only four are engaged in its development: Argentina, US, Canada and Australia.

Vaca Muerta is the main formation of non-conventional shale gas in Argentina and the second largest reservoir worldwide. It is located in the Neuquen basin that spans across Neuquén, Río Negro, La Pampa and Mendoza, all of which are provinces of the Argentine Republic.

Vaca Muerta reserves amount to around 22.6 trillion m³ of gas with basin extending to approximately 30,000 m². Billions of dollars are currently being invested into the region through a number of major oil, gas and energy companies including Shell, Wintershall Dea, Total, Chevron and ExxonMobil from overseas and YPF, Pluspetrol, Pampa Energía and TGS from Argentina.
Transportadora de Gas del Sur (TGS), translated in English to ‘gas transporter of the south’, is Argentina’s largest extractor of natural gas, having formed in 1992 after the privatisation of the country’s energy sector.

In December 2020, TGS finished works it had started 15 months prior in Tratayén, Neuquén – a US$300 million dollar investment for the construction of a 150 km pipeline and associated processing plant. The infrastructure will allow the gathering of non-conventional gas from the Neuquen Basin, as well as its injection into the country’s main transportation pipelines to supply different regions throughout Argentina.

These works consolidate TGS as the first midstream company in the Vaca Muerta region, as the pipeline goes through 30 of the basin’s producing areas and will enable the transportation of up to 60 million m³ of gas per day, which will be processed at the newly constructed plant. The initial processing capacity of the plant is 5 million m³ of gas per day, to be expanded in the future through the installation of new modules as the reserves continue to develop.

The Directorate of Exploration, Exploitation and Transportation of the Undersecretariat of Energy, Mining and Hydrocarbons inspected and subsequently certified the project after its construction, allowing it to be brought into service.

The project provides producers in the region with an integral solution to gas transportation thanks to the efficiency of its large-scale gas gathering infrastructure.

TGS is the largest gas transportation company in Argentina and operates its own gas pipeline system, the longest in Latin America. It is leader in the production and commercialisation of natural gas liquids, adding value to its clients and connecting producers’ activities to the market.

It also provides independent bandwidth services through its controlled company Telcosur S.A.

For more information visit www.tgs.com.ar
A major LNG producer wants to pipe gas from the Browse fields off the Kimberley, Western Australia (WA) to the North West Shelf (NWS) LNG plant on the Burrup Peninsula near Karratha. The main 42 inch (1,067 mm) export pipeline will be laid in water as deep as 510 m, more than double the maximum depth ever achieved before for this size of pipeline when Inpex built the Ichthys to Darwin pipeline in 200 m of water.

Water depth is one challenge for Woodside Browse Subsea Pipeline and Delivery Manager Patricia Long. Another is distance.

“The fact we are 450 km from Broome airport means these are long helicopter journeys and the pipelay vessel will need to have the facility to refuel the helicopters,” says Ms Long.

The pipelay will take about 12 months with 800 helicopter flights required to change out the 450-strong marine and construction crew.

“Helicopters bring their own inherent risk; therefore, do we approach this differently and consider high-speed vessels for crew changes?” she says.

**BROWSE IS BIG**

Gas from the Torosa field will travel the furthest. Some wells will be more than 20 km from the Torosa floating production, storage and offloading (FPSO) facility. The Torosa FPSO is connected by a 34 inch (860 mm) pipeline to a second FPSO 83 km away.

From there, the gas flows through an 833 km export pipeline to connect to the NWS pipeline and then travels about another 130 km to the NWS LNG plant. In total, the gas is transported more than 1,000 km.

The 80,000 carbon steel joints, with wall thicknesses between 25 mm and 29 mm, will weigh 620,000 t.

The scale of the project means issues that are of secondary importance on smaller pipelines need careful management. Twenty shipments will transport the joints of pipe to the coating yard and then the numbers start to get huge.

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Pipe dream

by Peter Milne, Freelance Energy and Resources Journalist

Energy heavyweight Woodside has US$28.73 billion plans to develop the Browse and Scarborough LNG projects offshore Australia. The project will feature massive offshore vessels feeding gas to sprawling LNG plants, but it is pipelines that will link it all to a gigantic two-basin gas export machine.
Trucks will travel 240,000 km around the coating yard where there will be 1.7 million pipe lifts.

“We know handling of the pipe is a high-risk activity,” said Ms Long.

Every time a pipe is inspected it needs to be handled, so Woodside is reevaluating the inspection points required along the supply chain. Even an end cap matters. Usually, the joints would require 160,000 plastic protective end caps that later need to be disposed of. Ms Long wants to look at alternative materials for the end caps.

SCARBOROUGH

While gas from Browse will go to the five existing NWS LNG trains, the Scarborough field will feed a new second LNG train at the nearby Pluto LNG plant through a 435 km, 32 inch (810 mm) diameter carbon steel pipeline.

Worley subsidiary Intecsea is producing the front-end engineering design and Saipem has the installation contract. Where the pipeline rises from 1,000 m water depth to 300 m as it traverses the continental shelf the route was carefully chosen to minimise the amount of unsupported spans.

Unlike Browse, Scarborough goes all the way to shore through more environmentally sensitive areas. They are also shallower waters, so more affected by the cyclones that frequent the region.

A 3 m deep trench will be dredged over the last 50 km of the route, which is in less than 40 m of water depth. The lay barge will place the pipe in the trench that afterwards will be backfilled to provide extra stability for the pipeline.

SMALL PIPELINE WITH A PUNCH

Separate to the Browse and Scarborough projects, Woodside plans a short onshore pipeline to link its two LNG plants, which is likely to unlock commercial value out of all proportion to its size as an engineering project.

In a year or two, production from the NWS fields will begin to decline leaving valuable liquefaction capacity idle until gas from Browse arrives in 2026. To snare an opportunity in November, Woodside awarded a contract to DDG Operations, a subsidiary of the Australian Gas Infrastructure Group, to build a 5 km, 30 inch (760 mm) interconnector pipeline to link two LNG plants.

This comparatively tiny investment will allow up to 1.5 million t of gas from the Pluto and Scarborough fields to fill the unused NWS capacity, starting in 2022. The interconnector could accelerate up to US$1.7 billion of revenue from gas that otherwise would not be produced until the tail end of the Scarborough field’s life.

It is the interconnector that makes two otherwise separate projects come together as the Burrup Hub. The 5 mtpa capacity line, to be operated by DDG, will allow Woodside to operate its two new offshore fields – 1,500 km of pipeline away from each other – and the LNG plants as an integrated operation.

This gives Woodside long-term operational flexibility to match offshore production with liquefaction capacity and reserves with long-term sales contracts, as well better deal with both planned and unplanned outages.

COVID-19 BRINGS CHALLENGES

The pipeliner’s dream that is the Burrup Hub has momentum but is yet to reach go. On 2 April, Woodside announced it was enacting a number of measures in response to both the oil price crash and the COVID-19 pandemic, which included the postponement of final investment decisions (FID) and an approximately 50 per cent reduction in total expenditure for 2020.

Woodside CEO Peter Coleman says these are “extraordinary times that no one could have foreseen”.

“Our immediate priorities have been minimising the risks from COVID-19 to staff, contractors and the communities where we operate, and maintaining our ability to deliver gas to the Western Australian and overseas customers who depend on us,” he says.

“The development of the Scarborough and Browse gas resources through Woodside’s
PROJECTS

The proposed Burrup Hub remains among the world’s most cost-competitive LNG investment opportunities and one which will provide significant economic returns to shareholders, governments and communities for decades to come.”

FIDs for Scarborough and Pluto Train 2 are now expected in 2021, while a date for Browse was not specified. The reduced expenditure means planned turnarounds of two LNG trains at the Karratha Gas Plant have been deferred until September 2020 and August 2021 respectively, while most of the company’s exploration activities have also been postponed.

Though a number of projects are now postponed – including Santos’ plans to kick off its US$4.02 billion Barossa project to send gas through a new 260 km, 26 inch (660 mm) pipeline to the existing Bayu-Udan pipeline, and then a further 100 km to the Darwin LNG plant – it is hoped the two oil and gas giants will succeed in their plans, which will see offshore activity in Australia reach all-time highs.

Woodside’s proposed Burrup Hub in Western Australia. Image courtesy of Woodside Energy Ltd.

To submit your abstract for the inaugural PPIM Middle East, visit www.ppimmiddleeast.com

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Dominion’s 25 year plan rolls on

Dominion Energy is in the middle of a more than two decade plan to replace thousands of kilometres of its mammoth pipeline system throughout the state. The latest instalment involves the replacement of natural gas pipelines in Cleveland.

Dominion Energy Ohio currently operates a natural gas pipeline system spanning more than 35,000 km across the state of Ohio in Midwest US. In 2008, the company launched its Pipeline Infrastructure Replacement program, a US$4 billion endeavour with an aim of replacing more than a quarter of the pipelines in its entire system.

Estimated to run for approximately 25 years, the program is upgrading the bare-steel, cast iron, wrought iron and copper pipe to either plastic or effectively coated steel pipe replacements. Dominion says the existing line is safe, but the enhanced lines will be more durable, resistant to corrosion and meet all US Department of Transportation regulations.

In 2016, the Public Utilities Commission of Ohio (PUCO) authorised Dominion to continue the program and recover the associated costs through to 2021 and approved the program’s annual spending to increase 3 per cent each year from US$200 million in 2018.

PUCO reviews Dominion’s expenditures annually and the approved increase in annual spending is to ensure the completion of the program falls within the originally approved 25-year time frame.

The latest operations in the replacement program occurred in Brooklyn, a suburb of Cleveland, where Dominion invested US$1.2 million to replace 2.3 km of piping on Ira Avenue, between the Ridge and Pearl roads. Some of the lines in need of replacement were installed close to 100 years prior, while others were installed in the 1940s and 1950s.

More than 170 customers are serviced by the pipelines in this area and all were notified 24-48 hours before the replacements began.

Dominion’s main headquarters are located in Richmond, Virginia and the company operates in 12 US states. The company manages the country’s largest underground natural gas storage system and has more than 5.3 million retail electric and gas customers.

For more information visit www.dominionenergy.com
What we must know in order to understand your risk assessment

by W. Kent Muhlbauer, WKM Consulting, Austin, Texas, US

When a risk assessment is presenting its findings as a range or distribution of possible values, we can usually at least partially see the effects of uncertainty. When risk estimates are presented as single values, we must know how uncertainty was handled in producing those values. This requires the author of the risk assessment to declare a level of conservatism used in his assessment.

In earlier instalments of this column, we introduced the concept of pipeline risk assessment Essential Elements. This is a list of ingredients that arguably must be included in any pipeline risk assessment. In this column, we address the essential element we call ‘controlling the bias’.

BIAS

The meaning behind the phrase – controlling the bias – can be less succinctly described as: identify, understand and manage the uncertainty, conservatism and subjectivity of the assessment. Much has been written about uncertainty, quantifications of uncertainty using statistical theory, and philosophical implications of knowledge types and lack of knowledge.

Here, we will focus on the more practical aspects of handling uncertainty in our pipeline risk assessments.

‘Controlling’ is a deliberate word choice. We recognise that some bias is intentional and useful, so we are not trying to avoid all bias. The right amount of bias applied at the right points in the process, is key, therefore, the intent is bias control.

Uncertainty is always present in our risk assessments because we have incomplete knowledge of true values – we don’t know the exact material properties at every point along every pipeline, we don’t know how many times an excavator will actually be digging near this segment next year, we don’t know where coating deterioration may have occurred, etc.

Even where we have measured values, we know that no measurement is perfect and all measurements can also be considered estimates. Measurements sometimes do not even involve the use of a measuring tool.

For example, an estimate of four excavations per km-year may be a forecast of the future activity level near the pipeline based on a measurement of four such events in the past year.

We estimate or measure knowing that there is an inaccuracy associated with either. We use samples to infer all possible values of the population and we understand that the real world involves distributions of possible values, not point values.

The nominal wall thickness we record is 0.25 inches (6.35 mm) but we know that, at various points along the pipeline, the wall thickness may actually range from 0.23 inches (5.87 mm) to 0.27 inches (6.78 mm).

We estimate the average risk (expected loss) for a segment of pipeline to be US$220/a but we understand there can be a multimillion-dollar incident here next year and again the year after!

We cannot eliminate this uncertainty, but we can manage it. This exactly mirrors risk – we cannot eliminate that either but can manage it.

PXX

It is important that a risk assessment identify the role of uncertainty in its calculations. Each assessment should be performed with a pre-determined target level of conservatism (which includes the handling of ‘uncertainty’, for our purposes here).

Depending on the intended use of the risk assessment results, various levels of conservatism might be appropriate. As an aid to communication of conservatism level, a PXX designation can be used to show a level of confidence that actual experience will be no worse than estimated.

For instance, P90 is the point where 90 per cent of future performance is expected to be ‘better’ than this value – one would be negatively surprised 10 per cent of the time or once out of every ten episodes. P99.9 is very conservative – a negative surprise occurs only once out of every 1,000 episodes.

The risk modeller should determine the level of conservatism appropriate to his audience needs. The PXX designation communicates this to the user of the risk assessment. PXX can refer to various aspects such as the conservatism in each input value or the conservatism in the final estimate.

P90+

A P90+ risk assessment (P99, P99.9, etc) intentionally contains layers of conservatism. A P90+ risk model assumes that things are ‘bad’ until proven otherwise.

This is done to encourage future data collection as a means of risk reduction and, more importantly, to ensure that risks are not underestimated. An underlying theme in a P90+ assessment is that ‘uncertainty shows as increased risk’.
This is a conservative approach requiring that, in the absence of meaningful data or the opportunity to assimilate all available data, risk should be overestimated rather than underestimated. Riskier values are generally assigned, reflecting the assumption of poor conditions, in order to accommodate the uncertainty.

This results in a more conservative overall risk assessment.

A P90+ level of conservatism encourages and quantifies the value of data collection via inspections and testing. It also avoids a discrediting of the model that would occur if, through the discovery of non-conservative estimates, it becomes apparent that the model is awarding the ‘benefit of the doubt’, thereby concealing possible risks.

So, a P90+ assessment is done to encourage data collection as a means of risk reduction as well as to protect the model’s credibility. Some pipeline-specific examples of high conservatism include:

- Assigning high rates to various potential exposures, e.g. using very aggressive corrosion rates, even when very rare.
- Assuming poor performance of older coatings and coatings of a certain type, even though, in the vast majority of cases, most coatings continue to perform very well.
- Use of worst-case potential consequences, even when potential for larger consequence scenarios is extremely small.
- Assuming weaknesses in pipe strength, even if no direct evidence suggests their presence.
- Underestimating the likely benefit of mitigations.

Note that when a number of P90+ inputs are used, they lead to final estimates that are much more conservative – perhaps P99.99 or higher. The P90+ assessment produces a point estimate for an extreme portion of the assumed distribution of actual values.

It suggests a very unlikely, but plausible, level of risk. Therefore, the P90+ assessment is more appropriate for use in risk management of individual pipeline segments. A P90 level – negative surprises only 10 per cent of the time – or higher is often warranted for risk management of specific pipeline segments.

P50

A P50 level of assessment represents the most likely estimates – the values that will occur most often. A P50 assessment best describes the anticipated behaviour of the entire population of pipeline segments. Such estimates are often used to calibrate the risk model.

However, P50 values will misrepresent the true risks for individual segments. This is because the P50, as a point estimate for the statistical mode or mean of the assumed distribution for the population, ignores the extreme values in that distribution. Therefore, it likely conceals important location-specific information.

In addition to its use in calibration, a P50 to P70 level of analysis might be appropriate for budget setting or long-range planning.

The ‘average’ behaviour of whole pipeline systems – collections of many pipeline segments – is better understood via P50 assessments. However, P50 estimates must be used very cautiously since they are designed to better communicate the average performance of populations rather than individual segments. They are often inappropriate for use in risk management of specific portions of a pipeline.

AN ESSENTIAL ELEMENT

This idea of bias-control might at first appear as a rather obscure, highly technical issue only. However, it is actually an essential element and critical to proper risk assessment.

It is essential to an understanding of the risk assessment and the subsequent use of the risk estimates. We will never have all the information we want or need so will always need to estimate some values.

A user of the risk assessment must know if your estimates are most probable (P50) values or if they contain conservatism, and, if so, how much (PXX). If not already defined, one of the first questions to ask when viewing a risk assessment is: ‘what is the level of conservatism in this assessment?’.
STATS boosts its numbers

The appointment of a new Chief Operating Officer is the latest in a string of significant moves by STATS Group to strengthen its role as market leader in pressured pipeline isolation, hot tapping and plugging services supply.

STATS Group has strengthened its management team with the appointment of Garry North as Chief Operating Officer. With more than 40 years’ experience in the engineering and oil and gas industries, Mr North has held senior operational management roles in Europe, North America and the Middle East.

STATS are market leaders in the supply of pressurised pipeline isolation, hot tapping and plugging services to the global oil, gas and petrochemical industries. Headquartered in Aberdeenshire, UK, the company also has operations in Edmonton in Canada, Houston in the USA, Abu Dhabi and Qatar in the Middle East and Kuala Lumpur in Malaysia.

STATS CEO Leigh Howarth says Mr. North’s appointment will consolidate the company’s solid reputation in the industry.

“Garry’s strong leadership qualities and his demonstrated ability to lead diverse teams, in different geographies, will deliver tangible benefits to the group,” he says.

“His focus will be to maintain and build on our excellent safety culture and to define and deliver improved operating processes, procedures and standards, to ensure we continue to meet the expectations of our growing client base.”

In addition to energy sector experience, Mr North has held executive positions in the aerospace, defence, petrochemicals and manufacturing industries, where he achieved significant business improvement and increased profitability.

Mr North says STATS remains entrepreneurial and inventive despite its established place in its field.

“My aim is to identify where we can fine tune and improve established procedures and to look at fresh ways of getting the optimum performance from the resources at our disposal,” he says.

“Any changes will firmly place safety and providing a safe working environment for our staff and end clients as a priority, while enhancing the entrepreneurial foundations on which the business has been established.”

NEW PARTNERS

In 2019, STATS agreed to an exclusive partnership with Safari Oil & Gas (SOG), one of the Kingdom of Saudi Arabia’s (KSA) top 50 listed companies. SOG is a diversified supplier of products and services to the oil and gas, water, and petrochemical industries in the KSA.

To support the partnership and drive expansion of STATS’ footprint in KSA, Business Development Manager Hafiz Abdul Kareem has relocated to the Kingdom from the United Arab Emirates to serve the market exclusively. STATS will supply equipment, services and personnel from its base in Abu Dhabi with a longer-term strategy of opening a permanent base in KSA.

STATS also signed a landmark Memorandum of Understanding (MoU) to work with Russian partners on Sakhalin-2, the country’s first offshore gas project. The MoU between STATS, Sakhalin Energy and OOO INTRA Services Company was signed during the Eastern Economic Forum in Vladivostok, which was attended by Russian Federation President Vladimir Putin.

One of the world’s largest integrated, export-oriented, oil and gas projects, Sakhalin-2 is operated by Sakhalin Energy Investment Company Ltd., which is owned by Gazprom, Shell, Mitsui and Mitsubishi. The project infrastructure includes three offshore platforms, an onshore processing facility, 300 km of offshore pipelines and 1,600 km of onshore pipelines, an oil export terminal and a liquefied natural gas (LNG) plant.

The agreement provides for STATS personnel to work jointly with Russian partners to implement projects for the maintenance, hydraulic testing, tie-in, isolation and shut-off of Sakhalin Energy pipelines. The MoU also serves as a starting point for long-term cooperation with a gradual increase in the Russian content and local production of STATS-provided technology in Russia.
T.D. Williamson celebrates 100 years

This year marks TDW’s 100th birthday, but despite its age the company is travelling stronger than ever as one of the most trusted, professional and safe names in the pipeline industry.

A century is a long time for any company to survive, but in such a constantly shifting landscape as the oil and gas sector it is a particularly admirable achievement. T.D. Williamson (TDW) has ridden its own ups and downs like any other entity would, but part of its longevity can be attributed to the company’s ability to meet any challenge head on and adapt to changing market conditions with a proactive attitude.

ORIGINS

The company was first established as ‘The Petroleum Electric Company’ by T.D. Williamson Sr in January 1920 as a supplier of electric motors, generators and other equipment for oil fields. Although the company existed for 12 years under this title, perhaps its most important contribution during this era was the introduction of a new cup-shaped rubber tool to clean pipelines.

TDW officially took on its famous name in 1933 and began operating out of Tulsa, Oklahoma where its headquarters would remain through to the present day. When the world was plunged into the chaos of World War II, TDW developed technology capable of effectively cleaning the recently developed War Emergency Pipeline System, which had diameters of 20 and 24 inch (500 and 609 mm) pipe.

While the origin of the name ‘pig’ has been questioned – some say it comes from the squealing sound it makes running through a pipeline, others say its an acronym for Pipeline Inspection Gauge – this technology would become the first pig used in the industry and played a vital role in helping keep pipelines maintained to ensure oil and gas supply to armed forces during the war.

CORNERING THE MARKET

In 1947, after the war ended, TDW constructed the first of its several manufacturing plants in West Tulsa, a location where many of the company’s operations still take place. With the construction of these plants, TDW was able to really entrench itself in the manufacturing side of the business and subsequently began to manufacture not just pigs, but other pipeline equipment as well.

TDW introduced several important pipeline products throughout the 1950s and 1960s including the first pipeline tapping machine, which it manufactured on behalf of Colonial Pipeline. The machine drilled branch connections to piping systems without leakage or interruption of line of flow, and now the company produces machines available up to 96 inches (2,438 mm) in diameter.

During these decades of immense productivity, TDW also introduced the first folding head STOPPLE® plugging machine, the PIG-SIG® scraper passage indicator, the SHORTSTOPP® low pressure plugging machine and the STOPPLE fitting design, which improved plugging fittings without increasing costs.

INTERNATIONAL EXPANSION AND BEYOND

With its success in the US, TDW was able to expand internationally beginning with the establishment of TDW Canada in 1958. This was followed by TDW UK in Maidenhead, England, while in 1969 the company constructed a new 1,200 m² manufacturing facility in Georgetown, Ontario.

The company continued to introduce new and innovative products to the market, such as conical pig cups and the KALIPER® pipeline geometric surveyor in the 1970s, before opening its first customer-oriented training school near its Tulsa manufacturing facility in 1977.

TDW crossed continents again in 1986, this time landing in Singapore through the opening of TDW Asia Pacific, before notching a major milestone in 1993 by becoming officially ISO 9001 certified. This certification signified that the company’s products met the standards and quality efficiency for the design and manufacture of monitoring, pigging, tapping and plugging essential piping systems in refineries, chemical plants, public utilities, onshore and offshore pipelines, gas transmission, and distribution systems.

By 2007, TDW had 50 locations worldwide and one every continent except Antarctica, and in the decade to come would open more facilities in places including India, Australia, Colombia and Kazakhstan. The company celebrated another landmark achievement in 2014 when it officially ticked over 800,000 km of inspected pipelines using its inline technology and recorded its 1,000th STOPPLE® Train double block and bleed isolation in the same year.

TDW has left a major mark on the pipeline industry, but even after 100 years it seems as if it’s just getting started. A push to innovate, grow and adapt through the years has consistently kept TDW at the forefront of the market and its constant consultation with those on the industry’s front line means the level of trust remains as strong as ever.

What the future holds is anyone’s guess, but if past form is any indicator you can bet in 100 years’ time that there’s every chance TDW will be celebrating birthday number 200.

For more information visit www.tdwilliamson.com
YPAC offers opportunities for industry engagement

Thanks to a partnership between the Canadian Gas Association (CGA) and the Young Pipeliners Association of Canada (YPAC), Outreach Lead for YPAC’s Impact on Industry Committee Shubham Garg was one of three young professionals invited to attend CGA’s Operations, Engineering Integrity, and Construction (OEIC) Conference in Calgary.

Mr Garg, a Field Engineer-In-Training at Modern Resources, was selected to attend the conference through a contest held by CGA, in which participants made submissions discussing the role of natural gas in Canada’s diverse energy portfolio, the economy and emissions reduction targets.

OEIC focused on open discussion and exchange of ideas around all aspects of natural gas delivery systems.

This year, there was an emphasis on addressing environmental policy through natural gas innovation, covering a variety of topics including safety standards, program optimisation, automation, pipeline assessments and methods to reduce leaks and emissions.

For more information or to join YPAC visit www.ypacanada.com

YPPE takes to the web

A lot of plans have changed in the face of COVID-19, with travel restrictions in place and many pipeline events being cancelled.

Many may feel that they are missing out, however the Young Pipeline Professionals Europe (YPPE) has taken the challenge of remaining engaged head on, making use of digital platforms to launch YPPE Fest – a full line-up of webinars presented every day to keep young pipeline professionals connected and broadening their knowledge.

The first week featured HDM Pipelines Pipeline Integrity Advisor Dr Sameera Naib’s presentation ‘Crack growth assessments in welded pipelines’; ROSEN Group Senior Engineer Lewis Barton’s presentation ‘Corrosion diagnosis, a fundamental necessity of integrity’; Inspire Integrity UK Head of Integrity Services Derek Storey’s presentation ‘Precise geometry data avoids costly offshore repair’; IK-UK Business Development Manager Dave Cockfield’s presentation ‘Pathfinder – a new direction in pipeline proving, debris mapping and operational pigging’; and Quest Integrity Service Line Manager InVista and PIMS Geert Bontekoe’s presentation ‘Do we require gauge pigs for difficult pipelines?’.

YPPE Fest was well received and hopes to continue to host webinars with support on an international scale; in exciting news, the international community for young pipeline professionals is continuing to grow, with new groups forming in Mexico, India, Malaysia and Asia Pacific, and Saudi Arabia and Cooperation Council for the Arab States of the Gulf.

For updates from Young Pipeliners International – the umbrella organisation for young pipeline profession associations worldwide – for updates about how to get involved with each of those groups or to seek help forming their own group, people can follow the LinkedIn page at www.linkedin.com/company/young-pipeliners-international

For more information or to join YPPE visit www.yppeurope.org
YPF gets heated in South Australia

The South Australian chapter of the Young Pipeliner’s Forum (YPF) hosted 24 young pipeliners from 13 companies for a renewable energy site visit and lunch.

Two groups went on a site visit at 1414 Degrees, either side of a lunch-and-learn session with the Future Fuels Cooperative Research Centre (CRC), which focuses on the pivotal role that new fuels and the existing gas infrastructure will have to play in a low carbon economy.

ASX-listed company 1414 Degrees is currently developing its patented thermal energy storage system. This first-of-its-kind technology stores energy as latent heat in molten silicon that can discharge both heat and electric energy.

It provides an alternative to gas, coal or electricity for process heat, enabling low cost carbon reduction using renewable energy sources. Most of the attendees had not previously heard of 1414 Degrees, with pipeliners asking lots of questions around the technology and potential market impact of this renewable source of energy.

Future Fuels CRC CEO David Norman hosted the lunch-and-learn session and explained how the group operates, along with providing an introductory overview for hydrogen as a renewable energy. Both of these sessions could have doubled in time with plenty of discussion and idea sharing.

The YPF would like to extend a massive thank you to 1414 Degrees and Future Fuels CRC for facilitating these sessions, and to event sponsors APA Group and ROSEN – without these organisations this event would not have been possible.

For more information or to join YPF visit www.apga.org.au/YPF
The Pipeline Pigging and Integrity Management Conference and Exhibition (PPIM) has celebrated another successful edition as the pipeline industry’s only forum dedicated exclusively to pigging for maintenance and inspection. More than 3,000 industry professionals gathered to attend the event, which included training courses, an extended technical conference, panel sessions, a packed exhibition hall, as well as valuable networking and social events.

TRAINING COURSES
Before the start of the conference, PPIM posted a range of training courses, covering topics including risk management, excavation and non-destructive evaluation, pigging and inline inspection, fracture mechanics, defect assessment, integrity management, repair and welding, cracking and dents, and hydrostatic testing.

The valuable courses were presented by experts in their respective fields.

EXHIBITION
On Tuesday evening, after the conclusion of the second day of courses, the exhibition was officially opened at a welcome reception sponsored by ROSEN Group. The function gave attendees an opportunity to get the first glimpse of the latest technology and innovation the industry has to offer, while socialising over drinks and canapes.

The two-day exhibition was once again a great success, featuring technology from renowned manufacturers and suppliers, along with knowledgeable professionals equipped with the most up-to-date information on the latest products and services. Those attending the exhibition made the most of the opportunity to network and connect with new and old contacts alike.

CONFERENCE
The conference kicked off on Wednesday with breakfast, before the opening plenary session was launched. Following opening remarks from BJ Lowe and Ben Stroman of conference co-organiser Clarion Technical Conferences, the first paper of the day was presented by Colonial Pipeline’s Juan Martinez and DNV GL’s John Godfrey on vendor auditing to improve ILI system performance.

After the plenary, the John Tiratsoo Award for Young Achievement, recently renamed in honour of the late John Tiratsoo, was presented to Kirsty McDermott of National Grid and David Futch of ExxonMobil.

After lunch – generously sponsored by Enduro – Jan Fowjin and Chris Yoxall from ROSEN resumed the sessions with a presentation that looked at going beyond compliance, followed by an informative talk from Tide Water Integrity Services’ Bryan Melan on the inline inspection standard API Standard 1163 and its applications on site.

Presentations from Gary Zunkel from Bluefin on hydrostatic test data acquisition and validation followed after the break, followed by an informative discussion on non-destructive testing.

In 2020, PPIM demonstrated why it is such a highly valued event in the pipeline integrity and inspection industry when its 32nd edition took place in Houston, US on 17–20 February.
technologies involving Dr John Kiefer and Michael Rosenfeld from RSI Pipeline Solutions, along with Troy Rovella from PG&E and Exponent’s Dr Peter Veloo. A paper from Integrity Plus’ Justin Raimondi on pigging rounded out the plenary before the program split into three tracks.

At the end of the day, delegates once again congregated in the exhibition hall for the Exhibition Reception, which was sponsored by Intero Integrity Services.

On Thursday, the sessions continued, covering ILI, engineering assessment, materials, crack and seam welds, hydrostatic testing, pipeline repair, leak detection and mechanical damage. Due to the high number of quality papers submitted, for the first time in the event’s history, the technical sessions extended to Friday, covering pipeline repair, data management, mechanical damage, leak detection and stress corrosion cracking.

PPIM would not be possible without the continued support of the event’s valued sponsors. In 2020, these were: Platinum Elite Sponsor, ROSEN; Platinum Sponsors, Intero Integrity Services, TD Williamson and Enduro Pipeline Service; Gold Sponsors NDT Global, MISTRAS Group and Halfwave; Silver Sponsors N-Spec, Circor, Q-Inline and Argus Machine.

PPIM is organised by Clarion Technical Conferences and Great Southern Press.
The PPIM event galleries are now online!
Visit www.pipelinesinternational.com/galleries/ to view the collection.
**Conference continues its four-decade legacy**

For more than 45 years, the Gastech Exhibition and Conference has been at the forefront of the international gas, LNG and energy market and is regarded as one of the most significant meeting places for upstream, midstream and downstream gas, energy and LNG professionals.

Gastech has fast become a next generation energy event, with more than 190 plenary, strategic, technical and spotlight presentations on key industry topics ranging from the evolving energy landscape to geopolitical risks, the event will provide attendees with key insights on the latest sector challenges and corresponding solutions.

In 2020, Gastech anticipates it will receive more than 33,000 attendees, more than 3,500 delegates and more than 700 exhibitors from countries all around the world. The conference is renowned for its quality, breadth and expertise, featuring an extensive range of both strategic and technical sessions that advocate for gas and LNG in the global energy mix.

Attendees will have the opportunity to hear from representatives of some of the biggest companies in the gas industry, including ExxonMobil, Shell, Tokyo Gas, Snam, Total, Woodside and more.

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**Gastech Exhibition and Conference**

8-10 September 2020

Singapore EXPO

Singapore

[www.gastechevent.com](http://www.gastechevent.com)

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**Croatia reschedules event for October**

Due to the outbreak of COVID-19, the 35 International Scientific & Expert Meeting of Gas Professionals has been postponed to now take place in October 2020. The new date will coincide with the arrival of a FSRU vessel to LNG terminal located on the island of Krk, with organisers now hoping it will be suitable to organise a technical visit to this site.

As one of the largest three-day international gas conference and exhibitions in central and southeast Europe, the event anticipates it will gather more than 600 distinguished gas and energy experts and managers from 230 gas companies and institutions to discuss current gas and energy topics.

The conference will cover several of the current issues relevant to the gas economy and energy industry stretching along the entire natural gas chain, as well as the key issues determining the development of natural gas markets in the near future.

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**International Scientific & Expert Meeting of Gas Professionals**

21-23 October 2020

Congress Centre of the Grand Hotel Adriatic

Opatija, Croatia

[susret.hsup.hr/en/](http://susret.hsup.hr/en/)
**Biennial conference makes its return**

The International Pipeline Conference (IPC) is held every second year in Calgary, Canada. Since it was founded in 1996 by a group of pipeline engineers and managers it has become a prestigious forum for promoting sharing and technical knowledge transfer within the energy pipeline industry.

The conference has significant support from the executive levels of pipeline operating companies and its regulators, which grows year after year. IPC includes participants from more than 44 countries and crowds of more than 1,300 delegates, with nearly 300 peer-reviewed papers presented by industry experts.

Over the course of the conference, special events are held for students, young engineers, seasoned engineers as well as management and executives.

The topics covered by this year’s program include: pipeline safety management systems; project management, design, construction, and environmental issues; pipeline and facilities integrity; operations, monitoring and maintenance; materials and joining; strain-based design and assessment; risk and reliability; and northern, offshore and production pipelines.

**International Pipeline Conference**
28 September – 2 October 2020
The Hyatt Regency Calgary
Calgary, Canada
[event.asme.org/IPC](http://event.asme.org/IPC)

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**Successful event returns for 11th year**

After 10 successful years, the China International Pipeline Conference and Exhibition will return in 2020 to attract more than 500 enterprises from around the world as exhibitors and attendees. The event has gained attention from associations and contractors across the globe through years of development and brand accumulation. With the scale of the exhibition continuing to increase, the event has become an incomparable platform for exchanges, cooperation and exploration throughout the oil and gas industry.

The 2020 event will conduct more than 56 activities including an equipment exhibition, leader’s summit, skill competitions, business negotiations and many celebratory events. By establishing the professional platform, the organisers have collated high-end attendees, exhibitors and presenters from across the globe to foster new drivers of industry development.

**China International Pipeline Conference and Exhibition**
15–17 September 2020
International Convention & Exhibition Centre
Langfang, China
[en.pipechina.net](http://en.pipechina.net)
Pipiliner pets

Bowie
Owner: Willem Vos, Halfwave
Bowie actually is a pipeliner himself – if he sees a tunnel, he goes wild and has to go through, even if he doesn’t really fit. He’ll make it through in the end!

Mishka and Onyx
Owner: Richard Singleton, Tremco Pipeline Equipment
Mishka and Onyx are Alaskan Malamutes. Malamutes are the big dumb cousins of Huskies and don’t like to swim as water has too many natural predators in their home element.

Axle
Owner: Charmaine Ogilvie, APGA
Axle is part Bengal, 16 months old and already weighs 6.3 kg! He is extremely intelligent, very interactive and enjoys playing fetch with his toys every night.

Teddie and Alfie
Owner: Craig Hall, Halfwave
Teddie (left) made Alfie’s (right) life a nightmare as he was biting him all of the time, until Teddie bit him in the nether regions! Alfie pinned him down by the neck and you would think he was a pig with the amount of squealing that was happening.

Do you have a photogenic pet that’s ready for a close up? Email your pipeliner pet photos to Pipelines international Managing Editor David Convery at dconvery@gs-press.com.au
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UPCOMING EVENTS

UESI PIPELINES 2020 CONFERENCE
9–12 August 2020
Texas, US
www.pipelinesconference.org

INTERPIPE 2020
15-17 September 2020
Langfang, China
en.pipechina.net

INTERNATIONAL PIPELINE EXPO
28–30 September 2020
Calgary, Canada
www.internationalpipelineexposition.com

INTERNATIONAL PIPELINE CONFERENCE
28 September – 2 October 2020
Calgary, Canada
www.event.asme.org/IPC

TRANSPORTATION OIL AND GAS CONGRESS
16–17 November 2020
Milan, Italy
www.togc.events

PIPELINE RISK MANAGEMENT FORUM
18–19 November 2020
Houston, Texas, US
www.clarion.org

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Features and deadlines are subject to change.

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– Ute Hillemacher, NDT Global

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