THINK BIG.

Size does matter. ROSEN maintains the industry’s most comprehensive technology portfolio, from hardware to software, as well as the largest tool fleet. Meaning more flexibility for you.

www.rosen-group.com
## Contents

**WORLD PIPELINES | VOLUME 15 | NUMBER 3 | MARCH 2015**

### Editor’s comment
03. Newbuild in the Netherlands.

### Pipeline news
05. Keystone XL Pipeline; PennEast Pipeline; Keathley Canyon Connector; Rover Pipeline project; Line 78 Pipeline and more.

### Regional Review
12. The domino effect
Gordon Cope examines how the recent tumult in energy markets is having a knock-on effect with South American producers.

### Intelligent Pigs
20. Broadening the remit
Martin Bluck, Magnetics Product Manager at PII Pipeline Solutions (PII), UK.

26. Multi-diameter methods
Laura Seto, Enbridge Pipelines Inc., Canada, and Dr. Thomas Hennig and Thorsten Sickinger, NDT Global GmbH, Germany.

33. One stop shop
Lorraine Coats, Precision Pigging, USA.

### Pipeline Equipment
39. Juggling industry requirements
Jérôme-Alexandre Lavoie, Creaform, Canada.

43. How they do it
Charlie Cantrell, Darby Equipment Company, USA.

### Composites Coatings
48. Composites to the rescue in the rainforest
David Hunter, NACE Level III Coatings Inspector, Neptune Research, Inc., USA.

55. Composite comfort
Tim Mally, Citadel Technologies, USA.

61. The quest for next generation coating
Cedric Oudinot, Head of Product Management, Rederio Shaw, USA.

### Pipeline Failure
67. Age-related concerns
Vivek Mittal, Global Product Manager for Hydratight, UK.

71. Life-extension strategies
Andy Duncan – Integrity Lead Consultant, Intertek Production and Integrity Assurance, Intertek, UK.

77. Check mark in the box
Gordon Aaker, P.E Engineering Services, LP, USA.

### Planning a Pipeline
81. Choosing the linear method
Lorne Duncan, Linear Project Americas, Canada.

86. Connecting pieces of the puzzle
Shankar Rajagopalan, Chief Technology Officer, Advanced Technology Division, CRC-Evans Pipeline International, USA.

### Compressors, Engines & Turbines
91. A boost in production
Joe Ryan, Miller Electric Mfg. Co., USA.

### Pipeline Steels Q&A
95. *World Pipelines*’ pipeline steels Q&A
Featuring DNV GL, Norway, and Welspun, USA.

### Valves & Pumps
101. Growth & revolution
Carlos Davila, Crane Co., USA.

---

**Maats** is one of the leading suppliers of pipeline construction equipment and services to the pipeline industry around the globe. Trading, renting and manufacturing equipment for the construction of pipelines with all common diameters. Maats supplies a wide variety of specialised construction machinery such as pipe layers, welding tractors, bending machines, related equipment and a variety of custom built and tailored equipment.

[www.maats.com](http://www.maats.com)
Leading the way.

Tier 4 emissions and the demand for enclosed cabs are changing pipelayer platforms. Midwestern's new M540c on CAT D6K2 LGP was designed utilizing state of the art 3D scanning, modeling and years of experience. This sideboom features a multi-functional joystick controller and a newly designed winch package with high efficiency, two-speed piston motors. Operator visibility is dramatically improved on both the boom and counterweight sides. Count on Midwestern to stay ahead of the ever changing needs and the competition.
NEWBUILD IN THE NETHERLANDS

This week I visited the Ceona Amazon multi-purpose pipelaying ship, which is sitting in dock at the Huisman’s yard in Schiedam in the Netherlands. The Ceona Amazon is a purpose-built versatile deepwater field development vessel, designed for operation in deeper waters such as off the coast of West Africa, in the Gulf of Mexico and offshore Brazil. Lloyd Werft built the ship after Ceona designed it in-house, and it has been a very quick two years in the making. The pipelay and crane equipment has been provided and installed by Huisman (in a handy colour coding exercise, everything that is yellow on deck has been provided by Huisman). The vessel has a 570 t multi-lay pipetower, two heavy duty 400 t offshore cranes and a special G-lay pipelay system, which is quite something to behold. The G-lay system features an inclinable lay spread, with up to 570 t of top tension, and a rigid firing line system. Steel pipe joints are assembled along a traditional S-lay spread and then pipe is deflected around a stern wheel and up, up into a conventional pipelay tower with two tensioners, before exiting vertically through the large 8 x 13.5 m midship moonpool (as in J-lay operations).

Designed to carry 8500 t of pipe, the Ceona Amazon will lay rigid, flexible and umbilical pipes and install heavy subsea structures with two cranes working in tandem. Based on a drillship design, the vessel boasts excellent sea-keeping characteristics, and has a pipelay tower placed as close as possible to the transverse axis of the ship, so as to minimise the effect of vessel motions on the pipe installation stresses. This will hopefully go some way in protecting field joints during pipelaying. Other supplies are: Emerging Markets Communications (EMC), which provided onboard communications; Ennsub will provide two ultra deepwater ROV launch and recovery systems for ROVOP (ROVOP is deploying heavy duty and ultra-heavy duty hydraulic work-class ROV systems, manufactured by FMC Technologies Schilling Robotics, from its growing fleet of modern ROVs to Ceona’s ships).

The ship is a massive 199.4 m long and 32.2 m wide, and she will enter into service soon. In fact, my trip was very much a ‘seeing off’ of the vessel, which was pieced together in Bremerhaven, Germany, floated at Crist yard in Poland and kitted out in the Netherlands and is due to sail this month. In 2013, Douglas-Westwood predicted that “pipelay vessel rates would increase by up to 8% for high spec.” We find ourselves in new territory in 2015 as, along with the oil price, the rates for offshore supply vessels are tumbling. Nevertheless, DW’s latest vessel report (World Subsea Vessel Operations Market Forecast 2015 – 2019) is confident that vessel demand will accelerate, with “Deepwater Gulf of Mexico, West Africa and Brazil … expected to account for 40% of global expenditure.”

London-based Ceona is a young company (created in 2012, with backing from Goldman Sachs Capital Partners), and the Amazon is the flagship vessel on which it will now hang its hat. The company’s other vessels in the fleet are two subsea construction vessels, the Normand Pacific (flexible pipelay) and the Polar Onyx (DP3 and flexible pipelay), which has been working offshore Brazil.

Talking of Brazil, the World Pipelines team is currently busy working on the annual Brazil issue, which we publish each autumn. This year’s Brazil issue will be the 9th edition and we always have a keen interest in new vessels being deployed in Brazilian waters. Other vessels recently in service include the new pipelaying vessels from Subsea 7 (built by IHC) Seven Rio and Seven Waves (with Seven Crioulo and Seven Suns still to come); the PLSV Sapura Diamante from SapuraKencana Petroleum (another IHC build, with a few more jewels to come: Onix, Jade, Esmerelda and Rubi); and the Saipem FDS 2 and new company flagship MV Castorane. Look out for the Brazil issue at Rio Pipeline and OTC Brazil later in the year.
This is what experience looks like

**POWER:** The Maats bending machine program ranges from 16 to 60 inch. The robust and reliable Maats bending machines have the capacity to bend pipes up to 1 inch wall thickness x100 of the maximum loadable pipe-size. The Maats bending machines are the strongest available in the market.

**OPERATION:** The layout of the machines is simple, operating the machine is easy. Machine settings can be easily controlled and if required easily adjusted.

**MAINTENANCE:** Built with mainly Liebherr components, all major parts have a proven track record as components build on heavy duty construction machinery. Service, maintenance and the odd repair is easy. Service and spare parts can be easily obtained from your local Liebherr dealer, anywhere in the world.
NEB imposes additional obligations for Enbridge’s Line 9

The NEB has approved two of Enbridge’s condition filings with regard to the Line 9B Reversal and Line 9 Capacity Expansion Project (Line 9) while imposing additional obligations for the lifecycle of the project.

Enbridge’s previous submissions on conditions 16 (valve placement) and 18 (watercourse crossing management plans) were insufficient. Based on additional information provided by Enbridge, the NEB has found that the company has adequately demonstrated that its methodology for the number and placement of valves is currently appropriate. There have been 17 new valves installed as a result of the hearing process; there are now a total of 62 valves along the pipeline.

The approval of these conditions does not conclude the NEB’s regulatory oversight of the project. It is a lifecycle regulator – from proposal, through operation and to abandonment. The board recognises the sensitivity of the location of the Line 9 pipeline and will make sure Enbridge is doing what it takes to keep their pipelines safe. As such, the Board has imposed obligations on Enbridge requiring the company to submit within the next 12 months:

1. Data, location and analysis, including a risk/benefit analysis, of an additional group of valves.
2. Further to condition 25, an analysis of all the water crossings and identifying whether any additional valves are needed based on that analysis.
3. Updates to the intelligent valve placement assessment that takes into consideration the additional data.

To ensure consistent oversight, the NEB Chair has taken the extra measure to authorise a member of the board, pursuant to section 14 of the NEB Act, to review all future filings for this project. This member is authorised to act with the full authority of the board.

The obligations imposed are in addition to the several post-construction conditions that Enbridge was already required to meet, including the requirement for ongoing consultation and continued emergency management planning. The board takes protection of people and the environment seriously and it expects the same of the companies it regulates. Prior to operating the pipeline, Enbridge must apply for, and be granted, final leave to open.

PennEast Pipeline to drive US$1.6 billion economic impact

The design and construction of the PennEast Pipeline will generate approximately US$1.6 billion in additional wages, revenues and investments to regional and state economies of Pennsylvania and New Jersey, according to a Drexel University study.

“PennEast Pipeline Project Economic Impact Analysis,” co-authored by Econsult Solutions, finds that the proposed project would have a major, positive impact on the economies of the two states in which it would be built and operated.

According to researchers, design and construction of the PennEast Pipeline would support approximately 12,600 jobs and an associated US$740 million in wages. Additionally, the ongoing operation of the pipeline would generate approximately US$233 million in annual economic impact, supporting 98 jobs with US$83 million in wages. Even greater economic impact from ongoing operations would be realised from the new supply of natural gas to PennEast customers in the Pennsylvania and New Jersey markets.

“Drexel’s analysis illustrates the substantial economic benefit of the PennEast Pipeline,” said Peter Terranova, Chairman of the PennEast Pipeline board of managers. “As a large infrastructural improvement project, it will support thousands of jobs and generate more than a billion and a half dollars of economic activity in Pennsylvania and New Jersey. The sustained long-term value of PennEast also would be realised in the form of lower energy bills to consumers.”

“Using detailed construction and operations budget projections, our team designed a model to estimate the economic impact the design and construction activity, as well as ongoing pipeline operations, would generate,” said Stephen Mullin, President of Econsult Solutions.

US House of Representatives passes KXL pipeline bill

The US House of Representatives has given its final approval to a bill – already passed by the Senate – backing the Keystone XL pipeline.

The White House recently said President Barack Obama would veto the bill. The bill has not enough votes to override a presidential veto.

The House of Representatives approved the bill by 270 votes to 152. One Republican voted against it, while 29 Democrats voted in favour. The bill had been expected to get a smooth passage through the House of Representatives. Both chambers are controlled by Republicans, who overwhelmingly support the construction of the pipeline.

The House endorsed amendments approved by the Senate in January. The amendments acknowledged the existence of climate change, and said oilsands should not be exempt from a tax to clean up oil spills.

This latest development sets up a confrontation with Obama, who has said he would strike down the pipeline bill because he retains the authority to make the final decision about the pipeline. Obama has said his decision would take into account climate change concerns, but is waiting for final reviews.

API President and Chief Executive Officer Jack Gerard applauded the bipartisan House passage of legislation to finally approve the Keystone XL pipeline.

“Democrats and Republicans in the House have now joined their colleagues in the Senate to approve this pipeline,” said Gerard. “The American people want the 42,000 jobs this pipeline would create. This bipartisan effort shows that Congress is listening to their constituents. We continue to urge the president to reconsider his veto threat, support the will of the people and prove that Washington can govern and enact meaningful energy policy.”

API thanked the bipartisan co-sponsors in both chambers of Congress for their leadership in advancing this legislation.
IN BRIEF

China
A meeting was recently held to address the state of the Intergovernmental Agreement on arranging supplies of Russian pipeline gas to China via the western route.
Alexey Miller, Chairman of the Gazprom Management Committee, also met with Wang Dongjin, Vice President of CNPC.

Mexico
Pemex, Mexico’s state-owned oil company, has announced that it will no longer use pipelines to ship finished, usable gas or diesel amid a wave of fuel theft.

USA
National Grid is joining Access Northeast as a co-developer. Access Northeast is designed to directly address the lack of sufficient natural gas pipeline infrastructure in New England while providing environmental and economic benefits.

Turkey
A meeting was held to address progress with the project for constructing the gas pipeline from Russia to Turkey via the Black Sea. The parties defined the key reference points of the route and technical solutions for the 180 km pipeline and selected a landfall location.

Alaska
The Bureau of Land Management has issued a Record of Decision for the proposed Greater Mooses Tooth Unit project, opening the way for the first production of oil and gas from federal lands in the 23 million acre National Petroleum Reserve-Alaska, which will provide a new energy source for the Trans Alaska Pipeline System.

Cameroon
Gaz du Cameroun S.A. has successfully completed pipeline pressure testing up to the boundaries of the Bassa and Logbaba power stations located in the port-city of Douala, Cameroon. GDC will now commence installing pressure reduction and metering units at both stations.

CPP and NAWAH sign agreement aimed at Iraq market
China Petroleum Pipeline, along with distributor and logistics service provider North America Western Asia Holdings, have entered into an agreement to jointly pursue potential energy sector development projects in Iraq.
With projections calling for US$48 billion of infrastructure investment to meet Iraq’s production targets, the country is experiencing unprecedented demand for international partners to help accelerate development of new pipelines, refineries and export facilities. Combining CPP’s experience in the energy industry with NAWAH’s Iraq-focused equipment and supply-chain expertise, the two companies are strongly positioned to win business in the resource rich country.
“Over the past 15 years, from West Africa and throughout Asia, CPP has constructed more than 40 long distance pipelines totalling 50,000 km and installed tank farms capable of storing 20 million m³ of oil and gas,” said CPP President Zhao Yujian. “We have the credentials and the commitment to assist Iraq in its accelerated, unparalleled development efforts.”
NAWAH, exclusive partner for the world’s largest provider of pipe, valve and fittings to the international oil and gas industry, strategically maintains a robust, in-country inventory of essential material to serve a growing energy sector.
Paul Brinkley, NAWAH’s President and Chief Executive Officer said: “This partnership brings enormous capabilities to Iraq and the country’s historic efforts.”

EU representatives discuss gas connectivity and infrastructure
On 9 February, representatives of Austria, Bulgaria, Croatia, Greece, Hungary, Italy, Romania, Slovenia and Slovakia, as well as the European Commission Vice President for Energy Union Maroš Šefčovic and Commissioner for Climate Action & Energy Miguel Arias Cañete, held the first meeting of the Central East South Europe Gas Connectivity (CESEC) High Level Group in Sofia. The objective of the High Level Group is to establish a regional priority infrastructure roadmap and advance its implementation in order to develop missing infrastructure and improve security of gas supplies.
Ultimately, each Member State of the region should have access to at least three different sources of gas.
Timely implementation of infrastructure is particularly important in view of the vulnerable situation of the Central Eastern Europe and South East Europe region. This was demonstrated most recently by the European Energy Security Strategy and Stress Tests performed last year. Security of energy supply is one of the building blocks of the EU project, one of the priorities for the European Commission.
At the meeting, the group’s discussions covered both external and internal aspects of the supply situation in the region, with a specific focus on interconnections and on the optimal use of existing infrastructure. Further expert level analyses will be carried out with the aim of identifying missing links and other barriers hindering effective market integration.

First gas from ultra-deepwater Gulf of Mexico Pipeline
Williams has announced with DCP Midstream Partners, LP, that the new extended Discovery natural gas gathering pipeline system is now flowing natural gas.
The Keathley Canyon Connector (KCC) deepwater gas gathering pipeline system and the South Timbalier Block 283 junction platform are serving producers in the ultra-deepwater Gulf of Mexico.
The 20 in., 209 mile KCC pipeline, which is capable of gathering more than 400 million ft³/day of natural gas, was constructed in depths of up to 7200 ft of water. “Building a pipeline in challenging terrain at this depth is incredibly complex, and I applaud our project team for their commitment to completing the project in a safe, environmentally responsible and timely manner,” said Rory Miller Senior Vice President of Williams’ Atlantic-Gulf operating area.
The KCC extension is supported by long-term agreements with the Lucius and Hadrian South owners, as well as the Heidelberg and Hadrian North owners, for natural gas gathering, transportation and processing services for production from those fields.
Only the most efficient technology ensures maximum availability

Challenging customer requirements call for excellent compression solutions.

siemens.com/energy/compression
Saipem to construct two new pipelines

The North Caspian Operating Company (NCOC) has awarded Saipem, through its subsidiary ERSAI Caspian Contractor LLC, a contract, at an approximate USD1.8 billion, for the construction of two 95 km pipelines, which will connect D island in the Caspian Sea to the Karabatan onshore plant in Kazakhstan. The scope of work includes engineering, welding materials, conversion and preparation of vessels, dredging, installation, burial and pre-commissioning of the two pipelines. Some of the scope will be executed with specialised subcontractors.

The two 28 in. dia. pipelines are made of carbon steel, internally cladded with a corrosion resistant alloy layer, and will have an offshore length of about 65 km out of the total 96 km. Construction will be completed by the end of 2016.

Umberto Vergine, Saipem Chief Executive Officer, commented: “This is a very important contract working for some of the most important oil companies in the world in a key region for Saipem. It also represents another relevant contribution to our backlog in this low price market environment.”

Shell and Sonardyne partnership

Sonardyne International Ltd, UK, has been used by Shell to successfully recover survey data from a network of long-life seabed sensors deployed in the North Sea. To date, the network of autonomous monitoring transponders (AMTs) has collected over a quarter of a billion measurements as part of a six year production monitoring study.

The AMTs were deployed in 2010 to meet Shell’s research and production monitoring requirements. Every few hours, each AMT wakes up to gather readings from a variety of inbuilt sensors, such as pressure and temperature. The measurements are logged and can be recovered on-demand from the surface using a Sonardyne 6G High Power Transceiver (HPT) acoustic telemetry modem.

For this latest data harvesting campaign, the Norwegian fishing vessel MV Elisabeth was chartered and a temporary deployment pole installed. To this, engineers fitted the HPT modem to gather data from each AMT within the network.

Inter Pipeline completes two pipeline expansion projects

Inter Pipeline Ltd has completed construction activity on two major expansion projects on its Cold Lake and Polaris pipeline systems. These projects, representing a combined investment of CAN$3 billion will provide transportation service to the Foster Creek and Christina Lake oilsands projects owned by the FCCL Partnership. As a result, Inter Pipeline will begin generating incremental EBITDA of approximately CAN$165 million/yr.

Pursuant to an agreement announced in July 2012, Inter Pipeline commenced work on an integrated, phased expansion of its Cold Lake and Polaris pipeline systems. In aggregate, Inter Pipeline will construct 840 km of pipeline and seven pump stations to provide transportation service to FCCL’s Foster Creek, Christina Lake and Narrows Lake oilsands developments. FCCL has committed to 850 000 bpd of bitumen blend and diluent capacity under a 20 year ship-or-pay agreement.

With the commissioning of infrastructure related to the Foster Creek and Christina Lake expansions, Inter Pipeline has completed approximately 90% of planned construction work. In 2016 and 2017, Inter Pipeline expects to invest an additional CAN$290 million to provide transportation service to FCCL’s Narrows Lake oilsands development.

News Highlights

- US crude oil pipelines and midstream report 2015-2021
- Update: BP Energy Outlook 2035
- Chinese oil, gas and petrochemicals

To read more about the articles go to www.worldpipelines.com
Canusa-CPS provides the world’s leading Factory Grade™ field-applied coating systems for 3LPE, 3LPP and FBE coated pipelines. Our GTS-PE, GTS-PP, and HBE coating technologies deliver truly consistent end-to-end pipeline coating performance. Combine GTS-PE or GTS-PP with our patented IntelliCOAT™ system for a fully automated coating application.
FlexTech secures double contract

Aberdeen-based flexible pipe specialist FlexTech has secured contracts worth in excess of £250 000. The projects, with two oil and gas majors, will take place both onshore and offshore supporting operations in the UK and the North Sea. FlexTech will execute flexible pipe and flexible pipe integrity work, covering offshore annulus testing and onshore life extension of flexible and subsea assets.

FlexTech Engineering Director, Craig Keyworth, said: “The contracts separately cover two and three year service agreements with clients who the team has previously worked with, representing a solid commitment from our customers.

“In the current market relationship building is imperative, and at FlexTech we strive to offer significant advantages to our clients. Our fixed price work scopes, ensure efficiency and flexibility, while representing real world savings.

“The team prides ourselves on our commitment to excellence, supporting clients from project inception to completion, and repeat business really helps to highlighting this.”

FlexTech offers a complete full lifecycle experience, from project inception to decommission and disposal. Its core business is the successful delivery of flexible pipe and riser engineering projects, offloading systems and integrity management and inspection. It also has a range of innovative products designed to facilitate ease of installation, ensure operational integrity and prolong the life of the flexible in field.

Fluor wins major pipeline contract

Fluor Corporation has been awarded a contract by NEXUS Gas Transmission, LLC, to provide engineering, procurement and construction management services for an approximately 250 mile natural gas transmission pipeline in Ohio and Michigan that is capable of transporting 2 billion ft³/d. Fluor booked the contract for an undisclosed value in the first quarter of 2015.

“This project is an example of how Fluor can deliver our integrated solutions to support the continued industrial and consumer demand for natural gas in the US,” said Pierre Bechelany, Fluor’s Senior Vice President of Pipelines and LNG. “This new award demonstrates Fluor’s strengthened position in the North America pipeline market, and we will bring our decades of pipeline design and construction experience to deliver cost and schedule efficiencies to the NEXUS project.”

Fluor is responsible for engineering, procurement, construction and project management services for the mainline pipeline, which will be up to 42 in. dia. In addition to the main line, Fluor is designing and managing the construction of up to four compressor stations in Ohio to maintain the pressure needed to push the gas through the pipeline as well as four meter stations that will provide flow control and gas quality monitoring services.

DTE Energy Company and Spectra Energy Partners, LP, are the lead developers of the NEXUS Project. The NEXUS Project is expected to cost approximately US$2 billion and is designed to deliver incremental production from the Utica and Marcellus Shale plays to meet growing demand for natural gas by distribution and end use markets in the Upper Midwest and Canada.

Enbridge pipeline contract for Price Gregory

Quanta Services, Inc. has announced that Price Gregory International, a Quanta Services company, has been selected by Enbridge Energy, Limited Partnership for the Line 78 Pipeline Project.

Price Gregory’s scope of work includes the construction and installation of approximately 79 miles of new 36 in. dia. crude oil mainline pipe, which will begin at Enbridge’s Flanagan Terminal near Pontiac, Illinois, and travel northeast to Enbridge’s terminal near Griffith, Indiana.

In addition, Price Gregory was selected to build and install the pumping station for Line 78 at the Flanagan Terminal and to make modifications to the Griffith terminal.

Construction of the Flanagan pumping station and modifications of the Griffith terminal began in late 2014. Construction of the Line 78 pipeline is expected to begin this March with completion anticipated in the autumn of 2015.

Quanta continues to have a positive outlook for the North American mainline market. There are oil, natural gas and natural gas liquids mainline projects in various stages of development throughout North America that should move forward as they obtain regulatory approvals. Quanta is in active discussions with various customers about many of these projects.

Rover and Vector announce capacity agreement

Rover Pipeline, LLC has signed a contract with Vector Pipeline and its affiliates for firm transportation capacity to deliver gas to markets in Michigan and the Union Gas Dawn Hub in Ontario, Canada, as part of the Rover Pipeline project. This arrangement continues to allow Rover to offer seamless transportation service to its shippers from the Marcellus and Utica production areas to markets in the Midwest, Great Lakes and Gulf Coast regions of the US and to the Union Gas Dawn Hub.

The capacity arrangement with Vector eliminates the need for Rover to build its pipeline through Michigan’s Shiawassee, Genesee, Lapeer, Oakland St Clair and Macomb counties. This new development is consistent with Rover’s ongoing efforts to minimise the project’s footprint. It is also consistent with the FERC’s guidelines and expectations, which encourage companies to evaluate alternative routes that maximise the use of existing utilities and utilise existing rights-of-way, where possible.

Through this agreement, Rover will eliminate 110 miles of pipeline through Michigan, and will eliminate the Canadian portion entirely.

The scope of the Rover Pipeline project continues to be designed to transport 3.25 billion ft³/d of natural gas with up to 1.3 billion ft³/d being transported into Michigan and/or Canada. Plans are underway to make the necessary modifications to the proposed project route and to file the final alignment with the FERC in mid-February 2015. Pending regulatory approval, Rover is still expected to be in service from the production areas to the Midwest Hub near Defiance, Ohio, by the end of 2016, and from the Midwest Hub to markets in Michigan and the Union Gas Dawn Hub by mid-2017.
Trusted Partnership

For four generations, companies around the world have trusted TDW’s unwavering commitment to pipeline performance.

So can you.

Inline Inspection • Non-destructive Evaluation • Interactive Reporting

North & South America
Europe / Africa / Middle East
Asia Pacific
Offshore Services
+1 918 447 5000
+32 67 28 3611
+65 6364 8520
+1 832 448 7200
TDWilliamson.com

T.D. Williamson

® Registered trademark of T.D. Williamson, Inc. in the United States and in other countries. ™ Trademark of T.D. Williamson, Inc. in the United States and in other countries. ©Copyright 2015 All rights reserved. T.D. Williamson.
THE DOMINO EFFECT

Gordon Cope examines how the recent tumult in energy markets is having a knock-on effect with South American producers.
Like all hydrocarbon producing regions of the world, the countries of South America are experiencing a wide range of reactions to the recent collapse of oil prices. Who stands to gain in the long run – and who stands to feel the most pain – depends on a wide range of factors.

**Venezuela**

Without a doubt, Venezuela has the most to lose. Since the ascent of Hugo Chavez more than a decade ago, Venezuela’s oil and gas sector has been through an unpleasant ride in the House of Horrors. The low point occurred in 2007, when the Chavez regime nationalised major projects in the Orinoco
Potiguar basin, located 55 km off the coast of the Rio Grande do Norte state. The well penetrated 188 m of 24 API oil in a permeable, porous formation. It also found gas and condensates in a wildcard well drilled in the Golfinho concession area located offshore of Espirito Santo state, as well as a gas discovery in the same basin in the Tanganika prospect.

New fields have also been coming online. Oil began flowing from the Iracema development of the Lula field, located in the Santos basin, in late 2014 after a new FPSO vessel, the Cidade de Mogoçotiba, was anchored in 2200 m of water. The vessel is capable of processing 150 000 bpd of high quality, medium density oil and 283 million ft³/d of gas (which is shipped to shore via a pipeline system).

Petrobras announced that subsalt production has now reached 500 000 bpd from 25 production wells. The company, which produces a total of 2 million boe/d, expects significant growth in the future. Production at the Libra area, for instance, is expected to reach 1.3 million bpd. In all, Petrobras forecasts its own production to plateau at 4 million boe/d between 2020 - 2030. Output for the entire country is expected to reach 5 million boe/d by 2023, with oil and gas exports achieving 1.5 million boe/d.

Such stellar projections, unfortunately, face many hurdles. Under regulations announced in 2010, rights to explore new subsalt targets in a region known as the Subsalt Polygon would be given to exploration companies that offered the largest share of output to the government. Petrobras would be guaranteed a minimum of 30% stake, and would run the exploration and production. Local content rules would also apply for services and construction.

The laws have already had deleterious results on the sector. The Libra field is the largest subsalt reservoir yet discovered in South America; covering some 1340 km², it is estimated to hold as much as 12 billion bbls of recoverable oil. But when the Brazilian government launched an auction to participate, only a handful of companies (mostly NOCs), expressed an intent to bid.

Further complications are now arising. The Subsalt Polygon is home to 80% of the country’s current production, and much of the acreage has been held by Shell, Chevron and other firms. The government promised that the 2010 law would not break any leases or standing operating agreements.

However, any field that is shared across leases must be run as a single unit by a single operator, a process known as unitisation. Because Petrobras is required to operate all future Polygon development, there is uncertainty about who would operate several newer prospects, including Shell and Total's BM-S-54 block. The block has a portion of its subsalt discovery protruding into Polygon land, which technically means that Petrobras could take over operatorship. Although the government has passed legislation in an effort to clarify ambiguities, much doubt remains.

Polygon problems have taken a back-seat to far more serious events however. Brazilian federal authorities have charged 24 people in connection with a vast corruption
THAT WAS A SAMPLE OF

WORLD PIPELINES®

MARCH ISSUE

DON’T WANT TO MISS OUT?

You will need to be a subscriber to read the full edition. Please log in to www.worldpipelines.com or alternatively click here to subscribe.

For more information about the comprehensive World Pipelines subscription package, please contact us:

www.worldpipelines.com  
E: subscriptions@worldpipelines.com  
T: +44 (0)1252 718999