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2013 – Issue 23

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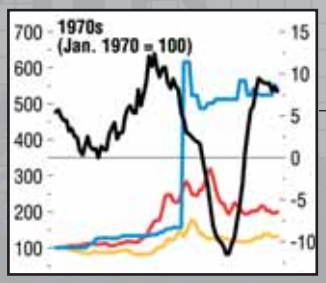

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Guidance Marine Increases Presence in Brazil

Guidance Marine has appointed Alessandra Bunel as Business Development Manager for Brazil. Alessandra will be based in Cabo Frio - Rio de Janeiro and will be focusing on expanding Guidance's local support infrastructure and developing new business opportunities for the company's range of DP local reference sensors, CyScan and RadaScan.

Alessandra has been working for the last 8 years in the Oil & Gas Industry and has built a strong experience in this field focusing on Business Development and Sales. She worked as a Business Development Director with Drilling Systems for 6 years, responsible for developing the business within Latin America.

Her most recent role was Business Development Manager for Nautronix, working in the area of acoustic positioning systems specialising in the offshore industry.

She holds a Bachelor in Business Administration and Economics from the University of Santa Catarina – Brazil, and an MSc degree from Bournemouth University in the UK. Her experience of the local offshore market, and being fluent in Portuguese and English, will be invaluable for Guidance to grow our presence within the region.

Declan O'Dea, International Sales Manager at Guidance commented, "Alessandra's appointment is our first overseas hire and indicates the strategic importance of the Brazilian market to our business. Having a local presence in Brazil is a key part in our growing investment in the region and will allow us to serve our existing customers better and participate more effectively in the future growth in the Brazilian offshore service industry. Alessandra's experience in the offshore sector, especially in the area of DP, will be a major asset for us in driving our growth in this region."

In addition, Guidance Marine has also recently signed a new Authorised Service Partner based in Macae – Net System Telecomunicações Ltda (NST Brasil). NST have 15 years' experience in servicing marine electronics equipment and specialise in the support and repair of communications and navigation equipment for the offshore industry. NST have recently completed training on our CyScan, RadaScan and miniRadaScan systems and we are delighted to add NST to our service network to complement our existing service partner, JRC do Brasil, based in Rio.

Above: Alessandra Bunel, left and Declan O'Dea, International Marine Sales Executive with Ivaney Mascharenas of NET Systems Telecommunications Ltda signing the Partner Agreement in early September.

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Petrobras Leads LA Rankings

Petrobras leads for the third year in a row the ranking of the 500 largest companies in Latin America. It also has the most valuable brand among the region's companies and it is the only Latin American corporation on the list of the top 100 best-reputed global corporations. The three rankings were announced between June and July 2012.

A list of the 500 largest companies in Latin America was published by the magazine *AmericaEconomia*. It was determined considering net sales values, in dollars, of Latin American companies in 2011. Petrobras achieved first place for the third consecutive year, with a turnover exceeding US$ 130 billion in 2011. The subsidiary Petrobras Distribuidora was placed sixth on the list, with revenues exceeding US$ 39 billion.

Petrobras also won the first position in the BrandZ ranking "50 Most Valuable Brands in Latin America", an original study sponsored by companies WPP and Millward Brown. Petrobras' brand value was estimated at US$ 10.5 billion. The study was based on interviews with about 2 million consumers in more than 30 countries.

Another highlight is the company's presence, for the second consecutive year, on the list of the top 100 global companies with the best reputation. Petrobras is the only Latin American company and the only energy company included in the ranking, at the 98th place. The list was prepared by the Reputation Institute, a private institution for advising and research. Companies were evaluated through research with a group of 47,000 people from 15 countries.

Petrobras... has the most valuable brand among the region's companies and... is the only Latin American corporation on the list of the top 100 best-reputed global corporations.

Second-generation Ethanol in Rio+20

Last June, during the UN Conference on Sustainable Development (Rio+20). Petrobras supplied fuel stations for the first time with its second-generation ethanol. The fuel supplied the vehicles that transported participants of the event, held in Rio de Janeiro.

The technology allows the expansion of ethanol production by 40%, using sugarcane bagasse as raw material. Petrobras has already produced 80.000 liters of second-generation ethanol at a demonstration plant located in the United States. The project, conducted by the company's research center (Cenpes) since 2004 – in partnership with scientific institutions and technology companies – predicts a yield of 300 gallons of ethanol per ton of dry bagasse. One of the partners is KL Energy, owner of the unit that Petrobras researchers have adapted to test the technology. Petrobras plans to start production of second-generation ethanol on a commercial scale in Brazil in 2015. The unit should be integrated with an ethanol plant operated by subsidiary Petrobras Biocombustivel (Petrobras Biofuels). The investment in the development of this technology is included in the total of US$ 300 million that the company will apply to biofuels research in the coming years.

In August, Petrobras' second-generation ethanol technology received the Prêmio Brasil Ambiental 2012 (Brazil Environment Award 2012) In the category "Environmental Innovation". The award, sponsored by the American Chamber of Commerce, recognizes environmental practices by companies operating in Brazil.

The investment in the development of this technology is included in the total of US$ 300 million that the company will apply to biofuels research in the coming years.

Investment in Solar Energy

Petrobras received the assent of the National Electric Energy Agency (Agência Nacional de Energia Elétrica – Aneel) for a project on research and development of a solar power plant in the state of Rio Grande do Norte. The plant, with a capacity of l.l MW, will be installed on the grounds of Petrobras thermoelectric plant Jesus Soares Pereira, at the city of Alto do Rodrigues. The generated power will be used by the company itself. The forecast for the beginning of the operation is the second half of 2014. The project began to be developed in 2012, contributing to the improvement of public data on the generation of solar (photovoltaic) energy, besides expanding the network of laboratories for tests and equipment certification and the training of specialized professionals. Its total cost is estimated at US$ 20.9 million.

An experimental platform with a 10 kW capacity will be deployed, as a model plant, at the Federal University of Rio Grande do Norte's Power and Renewable Energies Electronics Lab during the development of the project. Meanwhile, the Center for Renewable Technologies for Gas & Renewable Energies (CTGàs-ER) – a nucleus for research and training maintained by Petrobras in partnership with the National Service of Industrial Education (Serviço Nacional de Aprendizagem Industrial – Senai) – will receive qualification from the National Institute for Space Research (Instituto Nacional de Pesquisas Espaciais – INPE) to be able to conduct solar prospecting services.

Six stations for capturing data on solar energy will be installed in the CTGàs-ER, which will also have a laboratory able to give approval for equipment used in photovoltaic generation systems, as well as a center for training and certification of personnel to work on projects, assembly, operation and maintenance of photovoltaic systems.

The project began to be developed in 2012, contributing to the improvement of public data on the generation of solar (photovoltaic) energy, besides expanding the network of laboratories for tests and equipment certification and the training of specialized professionals.

Power Conditioning and Backup Protection of Pipeline SCADA Systems in Harsh Environments

By Michael A. Stout, Vice President of Engineering, Falcon Electric, Inc.

The management of complex gas and oil pipeline systems demands constant, reliable system-wide control. Typically this is accomplished with system-wide monitoring and control using sophisticated System Control and Data Acquisition (SCADA) equipment. The remote sensors, related Programmable Logic Controllers (PLCs) and client software are vital to the reliable supervision of product flow control, pipeline and manifold internal pressures, product measurement, etc. The location of remote SCADA PLCs and sensors are in some of the harshest environments on earth. Many are responsible for the monitoring and control of critical functions requiring absolute reliability. A reliable source of computer-grade primary and backup power is an essential element to assuring system reliability. Backup power is essential to maintain monitoring and control functions in addition to assuring the pipeline's infrastructure and safety. Without the SCADA system's continuous measurement and control, pumps and valves that control pressures within the pipeline and its manifolds could result in increased pressures potentially bursting the pipe causing costly hazmat spills and cleanups. Moreover, on steep slopes, check valves could remain open during a loss of power to pumps causing damage to pipes and valves on the downhill side. To further compound the problems, SCADA system PLCs are often sensitive to power pollution such as voltage spikes, sags, surges and common mode noise. These problems can result in unreliable PLC operation or failures. The solution to these problems is the addition of an on-line double- conversion uninterruptible power supply (UPS).

Power Protection for Harsh Power Environments

The double-conversion on-line UPS technology, through its continuous regeneration of new AC power, provides the highest level of power conditioning and protection (figure 1). On-line UPS technology is ideal for use as a combination high performance power conditioner and battery backup system. When used in a controlled temperature environment ranging from 0ºC to 40ºC (32ºF to 104ºF), most domestically available on-line UPSs can meet pipeline usage requirements as most have been tested and approved for operation over this temperature range by a safety agency such as Underwriters Laboratories (UL). However, in remote locations where SCADA monitoring equipment is located, the use of on-line UPS technology is required. Many remote outdoor installations are situated in harsh power environments where power sensitive PLCs and on-line UPSs may be installed inside buildings without any climate control systems, or in protective NEMA-rated enclosures. For example, the outdoor temperature in Phoenix, Arizona in the summer can be over 48°C (120ºF), while the low temperature in Prudhoe Bay, Alaska, can be below 30ºC (-22ºF). Even though the on-line UPS is protected from the remaining elements, attempting to use an off-the-shelf UPS in these extreme temperature environments is a poor decision and often results in a UPS failure.

A standard off-the-shelf on-line UPS having a UL or ETL Listing for operation over a 0ºC to 40ºC

Falcon UPSs in NEMA-rated enclosure are listed to operate across wide temperatures.

temperature range typically has been submitted by the manufacturer to a safety agency for an engineering evaluation. As part of the evaluation, a temperature profile is taken of the highest heat generating components and heatsinks to assure they do not exceed their maximum temperature ratings, while the UPS is operated at the maximum temperature specified by the manufacturer. A UPS incorporates many high power components that can over-heat and not only cause the UPS to fail, but present a risk of an internal UPS fire.

The safety agency also reviews the types of circuit board and plastic materials used in construction of the UPS with regards to their temperature ratings and limits. Due to the largest part of the UPS market demand being for products rated for use in temperature controlled environments, most on-line UPS manufacturers design

To meet the demand for wide temperature range UPS and power conversion products, a few manufacturers are designing products specifically to not only survive in these difficult environments, but to provide superior performance, while greatly reducing the servicing requirements.

their products for operation in the standard 0ºC to 40ºC operating environment and submit them to the safety agency for evaluation over the same operational temperature range. Installing this UPS in a building or NEMA enclosure without proper temperature control in the summer in Arizona would be using the UPS outside safety agency's product listing status. In many cases, since the UPS was designed for use in a limited temperature environment, internal components that were near their temperature limits when tested could exceed their maximum temperature ratings. This will result in the UPS having a greatly reduced reliability and service life, or an outright failure. At the higher temperatures of Arizona, plastics used in the UPS construction and battery can become deformed or cracked. The standard UPS battery used is typically not rated for temperatures above 40ºC to 50ºC. Further, per the battery manufacturer's rated 50ºC temperatures, the battery service life can be severely reduced from five years to a few months.

Battery Weakness

Temperatures below 0ºC present their own set of unique problems. Due to the electro/chemical design of most Valve Regulated Lead-Acid (VRLA) batteries in temperatures below -20ºC, depending on the battery design, can impair the batteries ability to deliver sufficient current to power the UPS properly. The amount of battery runtime can be reduced to less than 50 percent of its normal time when operated at 25ºC. Below -40ºC the electrolyte inside electrolytic capacitors used in the circuitry of the UPS can greatly lower the capacitor's capacitance or even freeze causing capacitors to rupture. This can cause the internal electrolytic capacitors to slowly dry out, resulting in eventual UPS failure. Below -40ºC, if not rated for this low temperature, some integrated circuits and optical isolator devices can function improperly causing the UPS to go to an alarm condition until warmed up. Again, a full UPS failure can result. At this low temperature, batteries can also freeze along with the plastics used in their case material becoming brittle and subject to cracking. As the battery electrolyte freezes it expands the plastic case and can cause the batteries to leak acidic electrolyte inside the UPS when the ambient temperature raises enough to allow the batteries to thaw out. This often renders the UPS unusable, requiring it to be replaced. A standard on-line UPS having an operational temperature rating of 0ºC to 40ºC should not be installed in protected outdoor locations having temperature extremes outside its rated limits, yet it is often attempted.

To meet the demand for wide temperature range UPS

and power conversion products, a few manufacturers are designing products specifically to not only survive in these difficult environments, but to provide superior performance, while greatly reducing the servicing requirements. The wider-temperature range products may be found in standalone UPS units or prepackaged turnkey systems from the manufacturer that are packaged into NEMA rated enclosures and cabinets. These systems are ready for immediate installation and operation and reduce the associated project engineering costs.

Typical Application

The pipeline starts at the well head and is an ideal example of how rugged, wide-temperature power protection equipment is installed and used. New drilling and well completion techniques such as Fracking have the potential to revitalize many of the played out oil and gas wells in the USA. Fluid is pumped down in to the well at very high pressures, about one thousand pounds per square inch. Since the fluid in the well is under such high pressure, should the utility power be lost to the pump it is imperative that the a valve be closed at the wellhead to prevent the fluid from coming back out of the well and causing a very expensive hazardous materials clean up. To eliminate this problem, a wide-temperature Uninterruptable Power Supply (UPS) is installed into a NEMA 3R rated enclosure on site. As the enclosure is located outside, the UPS is subjected to the wide range of temperatures experienced at the specific location. The UPS is used to provide backup power to both the onsite SCADA client system in addition to providing the power to close the wellhead valve.

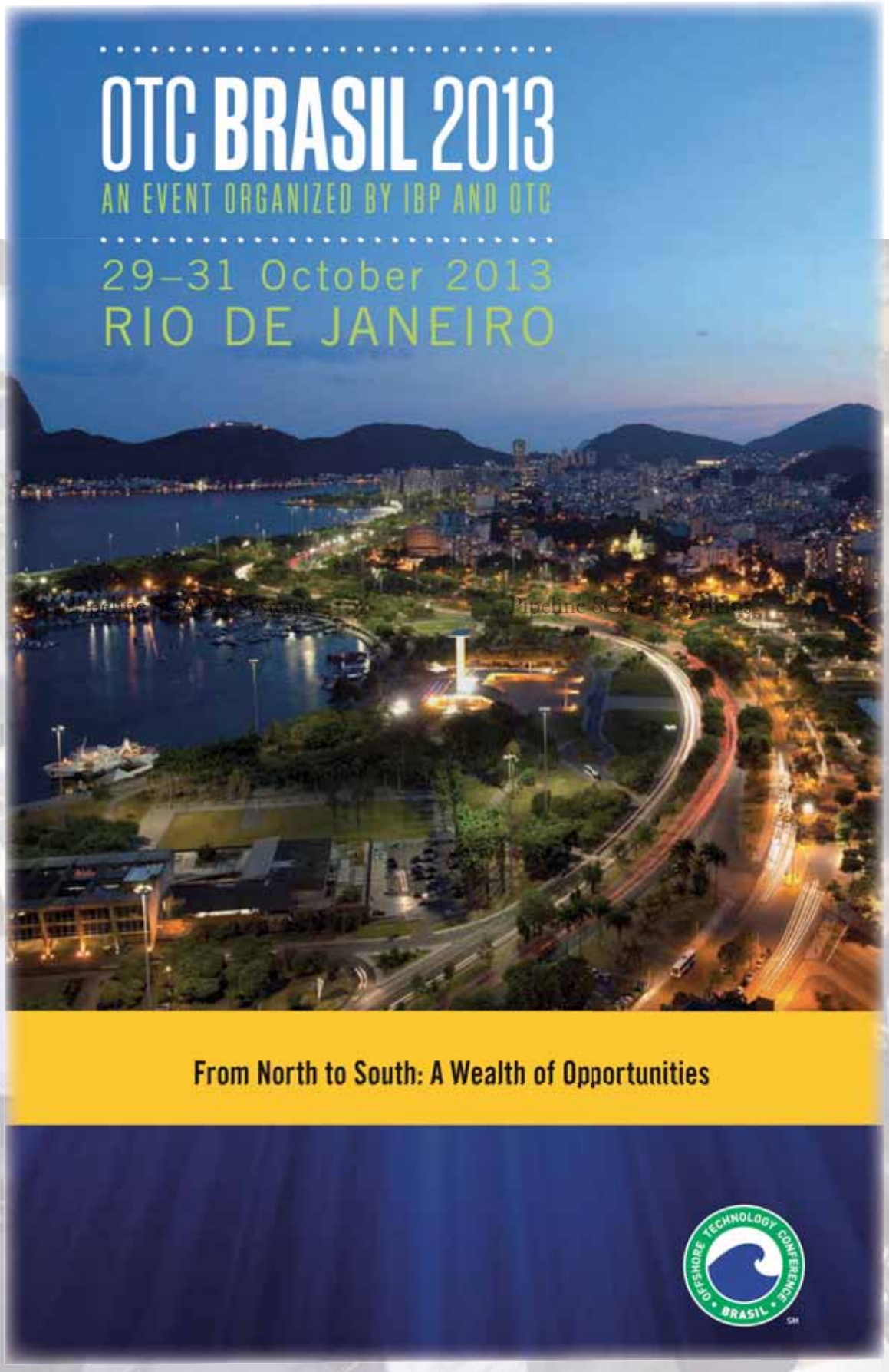
SCADA Security

Due to the critical nature of gas and oil pipelines there is a great concern that the SCADA network may become the target of a terrorist or foreign government attacks. UPS systems pose the threat of providing a potential backdoor into the network, or at a minimum, the remote control of a UPS powering a critical element in the pipeline system. For instance, a UPS powering a PLC responsible for controlling a key pipeline valve or pump control may be subject to outside sabotage through its unsecured SNMP/HTTP, Telnet, SMTP and other ports on the network Ethernet interface. When connected to the SCADA network using unsecure SNMP/HTTP agents it could compromise a portion or the entire pipeline system. The need for password hashing, data encryption and the ability to turn off or secure unused communications ports is essential to assuring an adequate level of security. Ethernet based MODBUS interface is also supported by several manufacturers as most PLCs support direct MODBUS connectivity.

In conclusion, the double conversion on-line UPS, rated for proper operational temperature ranges provides the ideal solution to utility power related problems. It can be used as an active surge protector, battery backup, precision voltage and frequency regulator and if programmable, much more.

About the Author:

Michael A. Stout, vice president of engineering of Falcon Electric, Inc. (www.falconups.com) is an authority in the computer automation, power conversion and UPS industries with nearly two decades of experience in critical power systems. In his current position, Stout specifies and designs new UPS and critical power system products and evaluates emerging technologies. He can be reached at 800-842-6940.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Session 1: Tuesday, 29 October 2013 1000 - 1200

Opening Remarks:

- Edward Stokes, *Chairman, OTC Board of Directors*
- João Carlos De Luca, *IBP President*
- Wafik Beydoun, *OTC Brasil Oversight Committee Chairman*
- Marcos Assayag, *OTC Brasil Program Committee Chairman*

Keynote Speakers:

- Lars Christian Bacher, *Development & Production International Executive Vice President, Statoil*
- Renato Bertani, *Chief Executive Officer, Barra Energia*

Session 2: Tuesday, 29 October 2013

Time: 1215 - 1340

Topical Luncheon 1: Planning and Management of Offshore Oil Opportunities in Brazil: Petrobras Perspective

Speaker:

- Maria das Graças Foster, *CEO, Petrobras*

Session 3: Tuesday, 29 October 2013 1400 - 1630

Nanotechnology and Offshore Applications

Session Chairpersons:

- Ebere Chimezie, *Shell*
- Ivan Cruz, *Subsea7*

1400		Nanomaterials Market Trend *P.S. Veliz, P&K Projetos e Consultoria Ltda*
1425	24425	Nanocoatings Applied to Corrosion Protection at the Oil and Gas Industry Trends *A. Forero, D. Giacometti, M.d. Alencar, R.P. da Silva, NanoBusiness Informação e Inovação; A. Labes, FMC Technologies*
1450		Nanosensors in Oil Reservoir Characterization and Evaluation *P.S. Veliz, P&K Projetos e Consultoria Ltda*
1515	24443	Improvement on Viscosity and Stability of Polyacrylamide Aqueous Solution Using Carbon Black as Nano-Additive *M.C. Soares, M.M. Viana, A. de Oliveira, G.G. Silva, V. Caliman, Universidade Federal de Minas Gerais*
1545	24310	Application and Evaluation of a NanoFluid Containing NanoParticles for Asphaltenes Inhibition in Well CPSXL4 *R.D. Zabala Romero, E. Mora, C. Cespedes Chavarro, L. Guarin, H. Acuña, O.F. Botero, Ecopetrol ; J. Patino, Petroraza; F. Cortes, Universidad Nacional de Colombia*

Session 4: Tuesday, 29 October 2013
Panel Session: Process Safety in Offshore Operations

Session Chairperson:

- Henrique Paula, *ABS Consulting*

Panelists:

- Steve Flynn, *BP*
- Maria Lúcia de Fatima e Silva, *Petrobras*
- Phil Murray, *Petrotechnics*
- Robin Pitblado, *Det Norske Veritas*
- Rodrigo Vidal, *Statoil*

Session 5: Tuesday, 29 October 2013
Panel Session: Process Safety in Offshore Operations

Session Chairperson:

- Francisco Pais, *Petrobras*

Panelists:

- Paulo de Tarso Themistocles Esperança, *Universidade Federal do Rio de Janeiro*
- Kazuo Nishimoto, *Universidade de São Paulo*
- Rubens Maciel Filho, *UNICAMP*
- Cristina M. Quintella, *Universidade Federal da Bahia*
- Clovis Raimundo Maliska, *Universidade Federal de Santa Catarina*
- Ana Cristina Bicharra Garcia, *Universidade Federal Flumimense*
- Marcelo Gattass, *Pontificia Universidade Catolica- Rio de Janeiro*

Session 6: Tuesday, 29 October 2013
Subsea Processing and Boosting

Session Chairpersons:

- Svein Haheim, *Shell*
- Alex Dal Pont, *Petrobras*

1400	24401	Development and Qualification of a High Differential Pressure Subsea Pump *L.S. Cunha, N. Fletcher, T. Hollingsæter, FMC Technologies; J.H. Vasconcellos, M. Bourne, T. Felix, P. Meuter, Sulzer Pumps*
1425	24428	Subsea High Boost Multiphase Pump System Development and Applications *C.M. Souza, C. Kuchpil, L. Carbone, L.T. Silva, M. Cerqueira, Petrobras; R. Huguenin, OneSubsea*
1450	24498	Subsea Processing and Boosting in Brazil: Status and Future Vision *F.A. Albuquerque, M.G. Morais, M.L. Euphemio, C. Kuchpil, D.G. Duarte, R. Orlowski, Petrobras*

1515	24307	Steps to the Subsea Factory *O. Oekland, S.R. Davies, R.M. Ramberg, H. Rognoe, Statoil*
1540	24359	Subsea Gas-Liquid and Water-Hydrocarbon Separation: Pipe Solutions For Deep and Ultra Deep Water *S.J. Anres, S. Shaiek, R. Hallot, S. Abrand, Saipem*
1605	24518	A New Environmental Lubricant Supports Key Subsea Boosting and Compression Technology *C. Morrissey, J. Morris, Castrol; A. Brunvold, OneSubsea Processing*

Session 7: Tuesday, 29 October 2013
Risers and Flowlines

Session Chairpersons:

• Alexandre Lagoa, *Petrobras* • Carlos Moreira, *Genesis Oil & Gas*

1400	24314	Passive Vibration Control Treatment for Subsea Pipelines *D. Norris, S.L. Williams, K.R. Ptak, Lord Corporation; P. Mazzoleni, North Carolina State University; D. Hahn, C. Masson, RiserTec, Inc.*
1425	24411	A Challenging Trunkline ILT Design Driven by S-Lay Installation - A Robust Design Solution Using Advanced Numerical Simulation *G. Kaliyaperumal, T. Zhao, B. Thompson, P. Cooper, R. Large, INTECSEA*
1450	24485	Parametric Study on the Effectiveness of Buckling Initiators To Control Pipeline Lateral Buckling in Deepwater Applications *M. Liu, J. Sun, G. Chang, ABS*
1515	24439	Viv Design of Large Diameter Export Riser Bottom Bend Spans *E. Valenzuela, R. Keel, L. Lee, MCS Kenny*
1540	24494	Development of an Ultrasonic Corrosion Probe *C.A. Patusco, C.S. Camerini, Petrobras; J. César Adamowski, F. Buiochi, M. Tsuzuki, Universidade de Sao Paulo; N. Almeida, IPT*
1605	24497	Evaluation of Technologies for Inspection of Riser Splash Zone *R.W. Santos, M. Pezzi, Petrobras*

Session 8: Tuesday, 29 October 2013
Reservoir Characterization

Session Chairpersons:

• Marcelo Blauth, *Petrobras* • Peter Schlicht, *Schlumberger*

1400	24459	Geomechanical Modeling of Fault Reactivation Associated to Depletion in an Offshore Poorly Consolidated Turbidite Reservoir *C. Lima, L. Lavorante, L. Carvalho, F. Oliveira, M. Santos, A. Moraes, M. Nogueira, Petrobras; M. Moriss, Paradigm Geophysical.*
1425	24324	Geomechanical Analysis and Critically Stressed Fractures in Offshore Brazil *M. Da Cruz, OGX; J. Oliveira, TEKTOS Consultoria; B. Silveira, Baker Hughes*
1450	24522	The Peregrino Challenge: How to Keep Reliable Models While Drilling Eight Wells per Year *C. Pettan, J.F. Stromsvik, Statoil*
1515	24383	Multidisciplinary Approach for Detailed Characterization of Shale Gas Reservoirs: A Netherlands Showcase *M. Zijp, R. Verreussel, J. Ten Veen, S. Nelskamp, Y.A. Schavemaker, TNO*

Session 9: Tuesday, 29 October 2013
Constructability and Design Considerations

Session Chairpersons:

• Mauro Costa, *Petrobras* • Roberto Goulart, *Petrobras*

1400	24410	Influence of Sea State in Evaluating the Accelerations at Critical Points of a Semisubmersible *B. Nabuco, R.G. Nunes, P.T. Nascimento, Det Norske Veritas*
1425	24486	Design of a Dry Completion Monocolumn Platform Unit Using Optimization Techniques *A.C. De Oliveira, Petrobras*
1450	24477	The Dynamic Effects of Water Columns Inside the Turret of FPSO *F.C. Rezende, N.A. Neumann, M. Gundelach, Bureau Veritas*
1515	24304	Floatover Feasibility in Brazilian Sea Water *W. Zhang, C. Jeong, A.v. Spreeken, Dockwisel*
1540	24305	Cellular Tendon - Enabling Technology for Ultra-Deep Water TLPs *Z.J. Yu, INTECSEA*
1605	24341	Development of Software To Predict Mud Weight For Pre-salt Drilling Zones Using Machine Learning *R.A. Gandelman, G.T. Teixeira, Petrobras ; D.G. Lins, R.M. Castaneda, ESSS; P.S. Teixeira, L.G. Pereira, R.G. Clemente, Intelie*

Session 10: Tuesday, 29 October 2013

Multiphase Flow

Session Chairpersons:

- Amadeu Sum, *Colorado School of Mines*
- Rigoberto Morales, *Universidade Tecnologica Federal do Parana*

1400	24492	Severe Slugging in Catenary Risers - Simplified Modeling *J.V. Oliveira, CEFET/RJ - Centro Federal de Educação Tecnológica Celso Suckow da Fonseca; M.A. Vaz, S. Jian, Universidade Federal do Rio de Janeiro*
1425	24326	Slug Catcher Two-Phase Flow Modeling and Numerical Simulations *C. Verga, M. Pinelli, University of Ferrara; A. Monesi, Bellelli Engineering*
1450	24293	Study of Slugs Control Techniques in Pipeline Systems *J. Vidal, Petrobras ; P.C. Monteiro, L.L. Silva, T.A. Netto, Universidade Federal do Rio de Janeiro*
1515	24395	Accurate Measurements of Liquid Condensate Rate With Multiphase Metering Technology Improves Ecological Impact of Well Test in Deepwater Exploration Well Offshore Brazil *P.D. Maizeret, Schlumberger; D. Reid, Shell; D. Essenfeld, B.C. Theuveny, Schlumberger*
1540	24352	Wet Gas Performance of a Low Energy Gamma Ray Multiphase Meter *C.M. Brister, OneSubsea*

Session 11: Tuesday, 29 October 2013

Well Integrity I

Session Chairpersons:

- Antonio Carlos Lage, *Petrobras*
- Luiz Alberto Santos Rocha, *Petrobras*

1400	24334	Smart Reamer Caliper: Real-Time Imaging of Wellbore and Underreaming Verification *W. Rasheed, SmartReamer; M. Alcure, J.R. Placido, A.C. Lage, Petrobras*
1425	24292	Successful Cement Plugs in HT/HP Presalt Offshore Wells in Brazil *L. Fagundes, OGX; F. Moretti, R. Silvestri, W. Moraes, M. Sobreira, G.G. De Bruijn, Schlumberger*
1450	24338	A Case Study: Long Cement Plugs in Ultradeepwater Environment in French Guiana - Challenges and Solutions *N. Gupta, Schlumberger; G.A. Fuller, R. Hatleskog, B.S. Martell, Shell ; M. Bogaerts, Schlumberger*
1515	24353	Analysis of Jump Out of Casing Connectors *J.R. Placido, J.L. Anjos, C. Fonseca, F.E. Roveri, Petrobras*
1540	24394	Stopping Severe Losses in Deepwater Environments Requires an Engineered Solution *M.L. Miller, D.L. Whitfill, J. Scorsone, Halliburton*
1605	24420	Study of the Influence of Cement Slurry Composition in the Gas Migration *J. Rocha, Petrobras; V. Calado, F. Tavares, Universidade Federal do Rio de Janeiro*

Session 12: Tuesday, 29 October 2013

Deepwater Floating Production Systems—Latest Technology Development and Qualification

Session Chairpersons:

- Rajiv Aggarwal, *KBR*
- Joe Fowler, *Stress Engineering*

1400	24511	Deepwater Floating Production Systems in Harsh Environment - A Look at a Field Development Offshore Norway and Need for Technology *T.S. Meling, Statoil*
1425	24512	The Tension Leg Platform Technology - Historical and Recent Developments *R. D'Souza, R. Aggarwal, Granherne*
1450	24466	Dry Tree Semisubmersible Application With Low Heave Motion and VIM Response *J. Kyoung, J.F. O'Sullivan, J. Kim, K. Lambrakos, Technip*
1515	24399	Comparison of Various Methods for the Assessment of Wind and Current Loads on a Semi-Submersible Platform *E. Croonenborghs, T. Sauder, S. Fouques, MARINTEK; S. Reinholdtsen, Statoil*
1540	24441	Structural Integrity Management Made Easy by Design *R. Spong, D. Gallagher, Energo Engineering*
1605	24346	Movable Chain Jacks and Winches, Case Study of Petrobras' P58/P62 and Eni's Goliat FPSOs *R. Grindheim, Aker Solutions*

Session 45 (was Thurs PM): Wednesday, 30 October 2013 0930 - 1200

Panel Session: Private Investments in Brazilian Oil & Gas Supply Chain

Session Moderator:

- Almir Guilherme Barbassa, *Petrobras*

Panelists:

- Paulo Rogério Caffarelli, *Banco do Brasil*
- Will Honeybourne, *First Reserve*
- Rodolfo Landim, *Maré Investimentos*
- Roberto Zurle, *BNDES*

Session 13: Wednesday, 30 October 2013

Panel Session: Perspectives on E&P in the South Atlantic

Session Moderator:

- João Carlos de Luca, *Barra Energia*

Panelists:

- José Miranda Formigli Filho, E&P Director, *Petrobras*
- Malcolm Brown, *Executive Vice President Exploration, BG*
- Mark Shuster, *Exploration Executive Vice President, Shell*
- Eunice Carvalho, *President, Chevron Brazil*
- Rocky Becker, *Vice President, Americas, ExxonMobil*
- Ladislas Paszkiewicz, *Senior Vice President for Exploration and Production Americas, Total*

Session 14: Wednesday, 30 October 2013

Dry-Tree Solutions

Session Chairpersons:

- David Reid, *Shell*
- Randy Jordan, *SBM Offshore N.V.*

0930	24517	Deepwater Development: Wet or Dry Tree? *D. Reid, M. Dekker, D. Nunez, Shell*
0955	24481	Dry Tree Semisubmersible System Solutions for Non-Hurricane/Non-Cyclonic Environments *O. Rijken, SBM Offshore*
1020	24480	The Multi-Column Floater: A Dry-Tree Semisubmersible for Deepwater Offshore Brazil *A. Tahar, L. Finn, N. Williams, Horton Wison Deepwater*
1045	24423	Dry Tree Top Tensioned Riser Systems *G. Dunn, GE Oil & Gas*
1110	24476	Challenges of TLP Installation Offshore Brazil *R. Kipp, SBM Offshore*
1135	24333	Dry Tree Solutions for Ultra-Deepwater in Offshore Brazil *J. Yan Lu, V. Hansen, C.V. Raposo, H. Davis, DNV*

Session 15: Wednesday, 30 October 2013

EOR

Session Chairpersons:

• Kamel Bennaceur, *Schlumberger* • Claudio Marcos Ziglio, *Petrobras*

0930	24470	Wettability Alteration in Carbonates By Surfactants: The Effects of Interfacial Tension on this Process and Reflex in Porous Media Behavior *M.F. Pinto, Petrobras*
0955	24281	Numerical and Experimental Investigation of Produced Water Reinjection on Viscous Oil Recovery *M.L. Rocha De Farias, Petrobras; M.d. Carvalho, PUC-RIO; A.S. Souza, Petrobras*
1020	24332	Invert Emulsion Acid for Simultaneous Acid and Proppant Fracturing *H.A. Oliveira, W. Li, J.E. Maxey, Halliburton*
1045	24454	Diffusion Coefficient of CO_2 in Light Oil Under Reservoir Conditions Using X-Ray Computed Tomography *S.V. Araujo, J.A. Vargas, O.V. Trevisan, State University of Campinas; R.G. Santos, University Center of FEI*
1110	24276	Comparative Experimental Design of Steamflooding for Optimal Efficient Performance of a Heterogeneous Light Oil Sandstone Reservoir *W.J. Al-Mudhafer, Louisiana State University*
1135	24372	Application of Mesophase Technology for Reservoir Damage Remediation and Improve Hydrocarbon Producibility -- A Successful Case History from Kuwait Field *H. Al-Ajmi, D. Rasheed Al Enezi, A. Al-Khaledi, K. Al-ajmi, a. Al-Ajmi, A.S. Al-Rushoud, N.K. Al Barazi, V.S. Veluri, S.S. Sharma, M.O. Awad, M. Al-Mutairi, Y. Khan, Y. Takate, V. Suryavanshi, Kuwait Oil Company; D. Clark, G. Sotomayor, P.B. Jadhav, P. Yadav, Baker Hughes*

Session 16: Wednesday, 30 October 2013

Completions and Workover I

Session Chairpersons:

• Eduardo Albino, *Schlumberger* • Augusto Borella Hougaz, *Petrobras*

0930	24417	A Novel Temperature-Activated, Rigid-Setting Material: Case Histories for Drilling and Conformance Offshore Applications *J.E. Vasquez, Halliburton*
0955	24362	Integrated 3D Acid Fracturing Model for Carbonate Reservoir Stimulation *X. Wu, C. Oeth, D. Zhu, A.D. Hill, E. Gildin, Texas A&M Universitys*
1020	24534	A Coiled Tubing Perforating Solution Incorporating a Gun Deployment System and Dynamic Underbalance Technique Improves Well Production in High Angle Deep Gas Wells in Saudi Arabia *H.H. Al Jubran, S.A. Al Buhassan, J.A. Leal Jauregui, S. Bolarinwa, Saudi Aramco*

1045	24387	Regaining Wellbore Access and Enhancing Safety Devices Operation by Removing Obstructions Using E-line Conveyed Technology *R. Torres, J. Huerta, A. Soto, R.M. Higa, PEMEX; J. G. Carrillo, A. Martinez, J.A. Ramos, WELLTEC*
1110	24302	Water Control While Acidizing: Case Histories and Lessons Learned After More than 2,000 Well Interventions *J.E. Vasquez, Halliburton*

Session 17: Wednesday, 30 October 2013

Production Optimization

Session Chairpersons:

• Hoss Shariat, *KBR* • Gustavo Ponce Lopez, *Repsol Sinopec Brasil*

0930	24301	Model Based Production Optimization Applied to Offshore Fields *A.F. Teixeira, M.M. de Campos, F.P. Barreto, V.R. Rosa, F.F. Arraes, A.S. Stender, Petrobras*
0955		Break
1020	24286	Advanced Control Systems for Offshore Production Platforms *M.M. Campos, A.F. Teixeira, O.F. Von Meien, S. Simoes, W.T. Santos, A. Pimenta, A.S. Stender,Petrobras*
1045	24294	Acoustic Reflectometry For Blockages Detection In Pipeline *J. Vidal, Petrobras; L. Silva, P.C. Monteiro, T. Netto, Universidade Federal do Rio de Janeiro*
1110	24329	Peregrino FPSO - Operation Challenges Overcome by the Use of Dynamic Simulation from Studies to Training *P. Thiabaud, N. Heloin, G. Jalby, RSI; T. Schiefloe, E. Haarklou, ABB*
1135	24424	Systems for Asset Management of Production Platforms *M.M. Campos, L.J. Cavadas, A.F. Teixeira, J.A. Matias, O.F. Von Meien, M.M. Machado, F.L. Ribeiro, H.C. Teixeira , F.E. Fadel, K. Saito, C.A. Cortez, R.C. Carvalho, S.G. Oliveira, F.D. Liporace, P.R. Ventura, P.S. Rodrigues, Petrobras*

Session 18: Wednesday, 30 October 2013
Regulatory Environment Driving the O&G Development

Session Chairpersons:

• Carlos Mastrangelo, *SBM* • Nelson Moczydlower, *Motitec*

0930	24363	Original View on Brazilian Local Content Regulatory Environment *R. Souza, SBM Offshore*
0955	24385	Understanding the Full Extent of the R&D Capability Within Brazilian Universities *S. Vahora, C. Dudgeon, OTM Consulting Ltd; H. Atie, ELO Group*
1020	24460	The Impact of Local Content Requirements and Project Delay on Deepwater Investment Analysis *T. Viegas, Universidade Federal do Rio de Janeiro*
1045		The Chevron Case In Brazil: A Look Over The Regulatory Agency Performance *L. Almada, ANP - Agencia Nacional do Petroleo*

Session 19: Wednesday, 30 October 2013
Topside

Session Chairpersons:

• Sidney Bereicoa, *ABS* • Christiane Machado, *ABS*

0930	24343	Sand Management Strategy Using Reliability Engineering Analysis Techniques: A Case Study of an Angolan Ultradeepwater Field *T. Arubi, B. Blosser, G. Gall, BP ; E. Igwe, Shell*
0955	24318	Development of Titanium Process Piping Welding/Assembly *F. Gondim, Petrobras; C.d. Gonzaga, Consultant*
1020	24322	Soft Rope Traction Winch (SRTW) *M. De Jager, Doedijns Group International; D. Carey, Logan Industries; M. Schols, Doedijns Group; J. Mahar, Logan Industries*
1045	24393	Control System Cyber Security:Staying Ahead of the Evolving Threats *C.O. Dewitt, ABS Consulting; J. Ellis, Neodigm Press*
1110	24308	Development of a Communication Technique Through Metallic Wall by Ultrasound *M.A. Cavaco, M.E. Benedet, C.R. Schmitz, G.M. Probst, Universidade Federal de Santa Catarina*
1135	24389	Technological Innovations on FPSO P-63 for Operation on Papaterra Oil Field *J.F. Nicodemos, P.F. Araujo, Petrobras; A.C. Rocha, Sondotecnica*

Session 20: Wednesday, 30 October 2013

Pre-Salt Carbonates

Session Chairpersons:

- Frances Abbots-Guardiola, *BG Group*
- Diego Gracioso, *Shell*

0930	24368	H_2S Risk In Pre-Salt Reservoirs *E.V. Santos Neto, E.T. Morais, A.A. Ferreira, Petrobras ; C.L. Torres, Gorceix*
0955	24446	Santos Microbial Carbonate Reservoirs: A Challenge *E.C. Dos Santos, H.F. Ayres, A.D. Pereira, J. Machín, Repsol Sinopec ; J. Tritllá, Repsol ; K.D. Leite, E.P. Silva, Repsol Sinopec*
1020	24482	Lacustrine Carbonates - For the Purpose of Reservoir Characterization Are They Any Different? *P.W. Corbett, Heriot-Watt University; L. Borghi, Universidade Federal do Rio de Janeiro*
1045	24483	Relative Permeability Effects on the Miscible CO_2 WAG Injection Schemes Through Compositional Simulations of Brazilian Small Scale Water-Wet Synthetic Pre-Salt Reservoir *S.F. Mello, P. Laboissiere, D.J. Schiozer, O.V. Trevisan, Universidade Estadual de Campinas*
1110	24452	New Completion Process Improves Efficiency For Stimulation of Multi-Zone Carbonate Reservoirs Offshore *B. Wellhoefer, M. Howell, S. Canning, Halliburton*

Session 21: Wednesday, 30 October 2013 1215 - 1345

Topical Luncheon 2: Drilling Better Together

Speaker:

- Stephen A. Colville, *President & CEO, IADC*

Session 22: Wednesday, 30 October 2013 1215 - 1345

Topical Luncheon 3: Total Exploration Strategy in Latin America

Speaker:

- Dennis Palluat de Besset, *Total*

Session 23: Wednesday, 30 October 2013 1400 - 1630

Topical Luncheon 3: Total Exploration Strategy in Latin America

Session Chairpersons:

• Hugues Corrignan, Wood Group • Rajiv Aggarwal, *KBR*

1400	24495	Cascade/Chinook Disconnectable FPSO: Free Standing Hybrid Risers Monitoring via Acoustic Control/Communications *R.Z. Machado Filho, Petrobras; C.F. Mastrangelo, SBM Offshore; J. Daniel, J. Xia, Petrobras; R.Y. Edwards, BMT Scientific Marine Services; R. Goebel, Goebel Consulting; M.S. Ling, Chemtech*
1425	24391	Assessment and Mitigation of Low-Toughness Forged Mooring Components for Floating Structures *A. Ku, D. Gallagher, Energo Engineering*
1450	24388	Reducing Uncertainty Through the Use of Mooring Line Monitoring *P. Elman, E. Elletson, J. Bramande, Pulse Structural Monitoring; K. Pinheiro, InterMoor*
1515	24537	Flexible Subsea Storage Unit Development and Applications *A. Kristoffersen, J.P. Kaalstad, Kongsberg Oil & Gas*

Session 24: Wednesday, 30 October 2013 1400 - 1630

Panel Session: Pre-Salt

Session Moderator:

• Ed Stokes, *ConocoPhillips* • Osmond Coelho Junior, *Petrobras*

Presentations:

Brazilian Pre-Salt Overview
Carlos Tadeu da Costa Fraga, *Petrobras*

Well Construction in Pre-Salt: Cost Reduction by Learning Curve and New Technologies
Renato Pinheiro, *Petrobras*

Subsea Challenges and Innovations in Santos Basin Pre-Salt
Cezar Augusto Silva Paulo, *Petrobras*

Fluids Processing Technologies in Pre-Salt Projects
Ana Maria Teixeira de Andrade, *Petrobras*

Materials Requirements for the Pre-Salt Projects
Carlos Joia, *Petrobras*

Logistic Issues Related to Pre-Salt Development
Pedro Chaves Moreira, *Petrobras*

Project Management in Pre-Salt Projects
Ricardo Beltrão, *Petrobras*

Session 25: Wednesday, 30 October 2013
Flow Assurance: Past Learning and Future Outlook

Session Chairpersons:

• Amadeu Sum, *Colorado School of Mines* • Ricardo Camargo, *Petrobras*

1400	24404	Risk Assessment Methodology for Flow Assurance Challenges: The Sooner You Look at It, the Better *D. Merino-Garcia, Repsol Sinopec; M. Dueñas-Diez, S. Gomez, J. Peña, Repsol*
1425	24531	Lessons Learned on Wax Issues From Deep Offshore Brazil *F. Fleming, J.R. Montesanti, R.M. Camargo, M.A. Goncalves, Petrobras*
1450	24396	Prevention, Management, and Remediation Approaches for Gas Hydrates in the Flow Assurance of Oil/Gas Flowlines *A.K. Sum, Colorado School of Mines*
1515	24375	Development of a Novel Kinetic Hydrate Inhibitor and Corrosion Inhibitor Package for Wet Gas Application *P.A. Webber, R. Harrington, R. Jones, N. Morales, J. Anthony, Nalco Company*
1540	24297	Ormen Lange Flow Assurance System (FAS) - Online Flow Assurance Monitoring and Advice *K. Holmas, G.G. Lunde, G.R. Setyadi, FMC Technologies; P. Angelo, G. Rudrum, Norske Shell*
1605	24437	A Comprehensive Analysis On Gas-liquid Slug Flows In Horizontal Pipes *R.E. Morales, C. Cozin, F.A. Barbuto, M.J. da Silva, D.R. Pipa, UTFPR*

Session 26: Wednesday, 30 October 2013
Brownfield: Debottlenecking to Safely Extend the Operational Lifetime

Session Chairpersons:

• Paulo Mauricio Videiro, *Petrobras* • Michael Wyllie, *SBM*

1400	24337	Brownfield: Debottlenecking To Safely Extend the Operational Capacities of Existing Facilities *H.K. Gaidhani, M. Hollaar, SBM Offshore*
1425	24330	Offshore Dry-Docking of FPSOs: A Response to Industry Needs *T. Terpstra, A. Hellinga, H. Leerdam, Dockwise*
1450	24347	Optimized Structural Integrity Management System and Inspection Program for a Converted FPSO *A. Nezamian, J. Altmann, WorleyParsons*
1515	24464	Risk Based in Inspection Applied to a Semi-Submersible Platform *V.C. Krzonkalla, J.S. Junior, G. Daniel, L.B. dos Santos, M. Barros, M. Silva, R.L. Duarte, J. Nunes, L.M. Portugal, V. Costa, ABS Group*

1540	24479	Produced Water De-Oiling System Qualification Programe *M. Tienhaara, H. van Wingaarden, B. Lammers, ASCOM Separation*
1605	24303	Compact Electrostatic Treaters for Efficient Crude Oil Dehydration and Desalting at Offshore Facilities *E.L. Sellman, S. Mandewalkar, G. Sams, Cameron*

Session 27: Wednesday, 30 October 2013
Carbonate Reservoirs (except Pre-Salt)

Session Chairpersons:

• Diego Gracioso, Shell • Pedro Pino Veliz, *P&K Projetos e Consultoria Ltda*

1400	24412	Reservoir Simulation of a Naturally Fractured Carbonate Reservoir From Campos Basins *R. Pimenta, Petrobras; D. Schiozer, S. Mello, J.C. Hohendorff Filho, Universidade Estadual de Campinas*
1425	24327	Jandaira Formation: An Analog Outcrop for Paleokarst and Fractured Carbonate Reservoirs *C.L. Cazarin, Petrobras ; F.R. Bezerra, Universidade Federal do Rio Grande do Norte*
1450	24409	Integrated Modeling for 3D Geomechanics and Coupled Simulation of Fractured Carbonate Reservoir *G.B. Meurer, A.C. da Silva, A.C. Correa, A.C. Soares, A.S. de Souza, T. Araujo, V.P. Naveira, Petrobras; J.V. Herwanger, R.B. Newman, Schlumberger*
1515	24270	Absolute and Relative Permeability from Well Logs in Tight Reservoirs *T.I. Elkewidy, American University in Cairo; H.T. Elkewidy, Texas A&M University; Y.T. Elkewidy, The American University in Cairo*

Session 28: Wednesday, 30 October 2013
Reservoir Engineering

Session Chairpersons:

• Farid Shecaira, *Petrobras* • Antonio Luiz de Souza, *Petrobras*

1400	24319	A General Analytical Solution for the Multidimensional Hydraulic Diffusivity Equation by Integral Transform Technique *M.D. Marsili, Queiroz Galvão Exploration and Production; P. Couto, Universidade Federal do Rio de Janeiro*
1425	24513	Design of Objective Function for Interference Well Testing *A.C. Bertolini, R. Booth, K.L. Morton, A.J. Fitzpatrick, Schlumberger*
1450	24442	Reservoir Limit Test Under Aquifer Influence *G.S. Feitosa, Petrobras*
1515	24416	Relative Permeability Rock Typing Through Clustering Combined With Heuristic Optimization *A.L. Martins Compan, Petrobras; G.C. Bodstein, P. Couto, Universidade Federal do Rio de Janeiro*

1540	24415	A Case Study: Streamline Technology for Evaluation of Performance of Bottom-Water Flooding in an Offshore Field *X. Guo, Southwest Petroleum University; P. Jiang, CNOOC; T. Huang, X. Zhou, Y. Liu, L. Tang, Y. Miao, R. Leng, Southwest Petroleum University*
1605	24288	Rock Characterization Study To Optimize Sand-Control Completion Strategy Using Samples Selected from Sandstone Reservoir *M.H. Alqam, H. Al Badairy, Saudi Aramco*

Session 29: Wednesday, 30 October 2013
HSE

Session Chairpersons:

• Paulo Furio, *FIRJAN* • Alberto Machado, *ABIMAQ*

1400	24283	Use of Fast Response Vessels in Brazilian Oil Spill Response Plans *B.D. Azevedo, M. Matos, R. Possobon, G. Xavier, P. Kammradt, D. Guedes, Petrobras*
1425	24331	Integrated Barrier Management Approach for Offshore Developments *R. Pitblado, DNV*
1450	24402	Establishment of Operational Criteria for Safe Launch of Free-Fall Lifeboats From a Turret-Moored FPSO *S. Fouques, E. Croonenborghs, V. Aksnes, N. Luxcey, MARINTEK; S. Reinholdtsen, C. Jokstad, Statoil*
1515	24287	Climate Change Impacts in Offshore Operations at Campos Basin *C.P. De Campos, M. Andrioni, Petrobras; J.E. Pereira, T.N. Bomventi, D.M. Moita, B. Ferrero, I. Wainer, University of São Paulo*

Session 30: Wednesday, 30 October 2013
Completions and Workover II

Session Chairpersons:

• Carlos Alberto Pedroso, *Queiroz Galvão Oil and Gas* • Flavio Ferreira, *Schlumberger*

1400	24427	World's First TAML Level 5 Multilateral Well with Individual Remote Inflow Control of Three Branches on Statoil's Troll Oil Field *L. Prebeau-Menezes, S. Mjølhus, Statoil; G. Liland, Halliburton*
1425	24354	A Diagnostic and Prognostic Framework for Integrated Reservoir-Completion Management Using Intelligent Well Data *M.F. Da Silva Jr, C.C. Jacinto, E.d. Radespiel, C.C. Jacinto, Petrobras*
1450	24384	First Design of Inflow Control Devices Completion in Offshore Khafji Field Sandstone Reservoir: Challenges and Application *A. Al-dhafeeri, Al-Khafji Joint Operations; M.M. Abd Elfattah, M. Salah, Schlumberger; T.I. Mohammed, T.M. Moawad, Al-Khafji Joint Operations*
1515	24268	Well Completion Experiences With Autonomous Inflow Control Devices in Latin America *F. Porturas, Halliburton*

1540	24279	Successful Chemical Sand Consolidation System Application To Repair Damaged Gravel Pack for Extreme Non-Consolidated Formations *E.L. Barragan, Andes Petroleum Ecuador Ltd; J.W. Pereira Suzart, H. Llerena, D. Medina, Halliburton*
1605	24523	Rheological Roles on the Dynamic Behavior of Drill-in Fluid Invasion and Oil Permeability Restoration of the Damage Zone *B.O. Silveira, R.Z. Moreno, Universidade Estadual de Campinas*

Session 31: Wednesday, 30 October 2013

Materials Performance I

Session Chairpersons:

- Pascoal Bordignon, *CBMM Consultant*
- Wilson Cordeiro, *Apolo Tubulars*

1400	24312	UOE Pipes for Ultradeepwater Application *O. Reepmeyer, A. Liessem, J. Schröder, B. Maerten, F. Combaud, EUROPIPE; P. Fluess, Aktien-Gesellschaft der Dillinger Huettenwerke; C. Buirette, GTS Industries*
1425	24453	Qualification of UOE SAWL Linepipes with Enhanced Collapse Resistance for Ultradeepwater Application *F. Arroyo, R.C. Silva, L.O. Mantovano, Tenaris; R. Solano, F. Azevedo, Petrobras*
1450	24458	Heavy Wall UOE SAWL Pipes for Ultra Deep Water and Sour Service Application *F.A. Moreira, C. Gauss, R.C. Silva, Tenaris; C. Stachelberger, Voestalpine*
1515	24392	New Melt-Processable Perfluoropolymer With Upper Use Temperature of 300°C *P. Strabelli, DuPont*
1540	24535	Development Of X70 and Heavy Wall X65 Plates For Sour Service Pipeline Application *C. Collura, T. Staudt, J. Bauer, V. Schwinn, AG der Dillinger Huettenwerke; D. Clipet, E. Amoris, GTS Industries*
1605	24271	Prediction of Sand Erosion in Choke Valves - CFD Model Development and Validation Against Experiment *E. Gharaibah, Y. Zhang, R. Paggiaro, J.D. Friedemann, GE Oil & Gas*

Session 32: Thursday, 31 October 2013 0930 - 1200

Offshore Heavy Oil

Session Chairpersons:

• Wagner Trindade, *Petrobras* • Vibeke Haugen, *Statoil*

0930	24529	Roncador Module IV: A Successful Case of Heavy Oil Projects in Ultradeepwaters *E. Bordieri, D.H. Lage, H.P. Moro, G.d. Maia, Petrobras*
0955	24510	Maximizing Heavy Oil Production and Reserves Through a Multidisciplinary Well Construction Process *C.J. de Lima, L.L. Loures, E. Galletti, V.J. Haugen, Statoil*
1020	24504	Papa-Terra Project: Use of Innovative Solutions for Heavy Oil in Deepwater *D.S. Condessa, G.d. Danno, S.C. Vieira, W.P. Goncalves, Petrobras*
1045	24503	ICD/AICD for Heavy Oil - Technology Qualification at the Peregrino Field *I.L. Leitao Junior, M. Negrescu, Statoil*
1110	24272	Value of Well Test Acquisition Strategy and Advanced Interpretation Methodology on an Offshore Heavy Oil Field *D.M. Torres, D.F. Vasconcelos, Statoil*

Session 33: Thursday, 31 October 2013

Panel Session: Implementation of Offshore Mega Projects in Brazil: Challenges and Opportunities

Session Moderators:

• Nelson Moczydlower, *Motitec* • John Haney, *Shell*

Panelists:

• Joper Andrade Filho, *Petrobras* • Raul Sanson, *FIRJAN / ABIMAQ*
• Philippe Levy, *SBM* • Carlos Flesch, *Independent Project Analysis*
• Alberto Padilla, *EBR*

Session 34: Thursday, 31 October 2013

Water Management in Offshore Projects

Session Chairpersons:

- Claudio Furtado, *Petrobras*
- Roberta Mendes, *Petrobras*

0930	24532	Increasing Oil Recovery on the Grane Field With a Challenging PWRI *L. Tipura, A. Fagerbakke, T. Tjomsland, Statoil*
0955	24508	Scale Management in Deepwater and Ultradeepwater Fields *M.C. Bezerra, F.F. Rosario, K.R. Rosa, Petrobras*
1020	24530	Minimizing Scale Deposition Through Surface Enhancement in Downhole Tools *N. Goodwin, G.M. Graham, Scaled Solutions Limited; E.H. Albino, R.B. Bhavsar, Schlumberger; H.L. Pinto, M.M. Bezerra, Petrobras*
1045	24465	Preliminary Studies on the Application of Ceramic Membranes for Oilfield Produced Water Management *S.E. Weschenfelder, Petrobras Research Center for S.E. Weschenfelder; A.T. Louvisse, C.P. Borges, J.C. Campos, Federal University of Rio de Janeiro*
1110	24431	Case Study: Utilizing of Inflow Control Devices in Control Wells Water Production and Regulate Waterfront Encroachment *A.M. Al-dhafeeri, Al-Khafji Joint Operations ; M.M. Abd Elfattah, Schlumberger; T.I. Mohammed, T.M. Moawad, H.A. Bajunaid, Al-Khafji Joint Operations*
1135	24527	Carbonate Petrophysical Properties: Computed Tomography (CT) for Experimental WAG Design Under Reservoir Conditions *P. Laboissiere, R.G. Santos, O.V. Trevisan, Universidade Estadual de Campinas*

Session 35: Thursday, 31 October 2013

Panel Session: The Evolution of Vessels, Platforms and Key Systems for the Offshore Industry

Session Moderators:

- Peter Noble, *Noble Associates LLC*
- Fernando Frimm, *Gusto MSC*

Panelists:

- Mauro Costa de Oliveira, *Petrobras/CENPES*
- Sjoerd Hendriks, *Gusto MSC*
- Anis Hussain, *Keppel FELS*
- Alexandre Mitchell, *Saipem*
- Ardaan van Spreeken, *Dockwise*
- Franciso Ruiz Miranda, *Dockwise*

Session 36: Thursday, 31 October 2013
Deepwater Hydrocarbon Processing from Topside to Subsea

Session Chairpersons:

• Hoss Shariat, *KBR* • Luis Felipe Batalla Toro, *RepsolSinopec*

0930	24429	Development of a Compact Topside Processing Facility *R. Mikkelsen, FMC Technologies; D. Carrijo de Melo, Petrobras*
0955	24313	Synergies Between Membrane Pretreatment and NGL Recovery in an Offshore Environment *S. Tierling, S. Jindal, KBR*
1020	24325	FPSO Computational Fluid Dynamics (CFD) Analysis in Heavy Sea Storm Conditions for the Validation of Process Design *C. Verga, M. Pinelli, University of Ferrara; S. Dell'Oglio, A. Monesi, Bellelli Engineering*
1045	24519	Subsea Versus Topside Processing: Conventional and New Technologies *C.A. Capela Moraes, F.S. da Silva, A.S. Monteiro, D.A. de Oliveira, P.M. Marins, Petrobras*
1110	24533	Commissioning and Startup of Subsea Marlim Oil and Water Separation System *C.A. Capela Moraes, A.S. Monteiro, F.S. da Silva, D.A. de Oliveira, G.M. Raposo, R.d. Pereira, V.P. Baracho, C.C. Casanova, M.L. Euphemio, D.G. Duarte, R.d. de Souza, Petrobras*
1135	24273	Springs: Subsea Seawater Treatment Case Study *P. Pedenaud, L. Rivière, Total; R. Hallot, S.J. Anres, Saipem ; G. Skivington, VWS Westgarth Ltd*

Session 37: Thursday, 31 October 2013
Tools and Methodology Applied to Risk and Integrity

Session Chairpersons:

• Christiane Machado, *ABS* • Maria Celia Ximenes, *Chevron*

0930	24348	Qualification and Validation of DTS/DSS Technology for Umbilical Monitoring *F. Ravet, C. Borda, E. Rochat, M. Niklès, Omnisenss*
0955	24484	A Robotics Framework for Planning the Offshore Robotizing Using Virtual Reality Techniques *I.H. Santos, M. Galassi, Petrobras; P. From, Norwegian University of Life Sciences; L. Hsu, F. Lizarralde, R. Costa, G.M. Freitas, G.M. Ribeiro, T. Almeida-Antonio, F. Coutinho, Universidade Federal do Rio de Janeiro; A. Raposo, F. Carvalho, D. Medeiros, PUC-Rio*
1020	24386	DORIS - Offshore Facilities Monitoring Robot *G.P. Carvalho, G.M. Freitas, R. Costa, G.H. Carvalho, J. Oliveira, S. Netto, E. Silva, M. Xaud, L. Hsu, G. Motta-Ribeiro, A. Neves, F. Lizarralde, I. Marcovistz, A. Peixoto, E. Nunes, Federal University of Rio de Janeiro; P. From, Norwegian University of Life Sciences; M. Galassi, Petrobras; A. Røyrøy, Statoil*

1045	24430	Examining Progressive Collapse of Framed Structures in Response to Fire and Explosion Consequence Events *M. Reed, E. Peterson, MMI Engineerings*
1110	24342	Offshore Environmental Risk Analysis - An Overview About its Importance in Brazil and Norway *L. Varoveska, C. Cardoso, DNV*
1135	24397	Subsea Geohazard Risk Assessment and Pipeline Integrity Management: A GIS-Based Data Integration Approach *M. Li, D. Zhai, M. Bik, M. McQueen, INTECSEA*

Session 38: Thursday, 31 October 2013
Offshore Logistics

Session Chairpersons:

• Daniel Moczydlower, *Embraer* • Alceu Mariano, *Keppel FELS*

0930	24366	A Novel Solution to Deepwater Logistical Challenges: Fast Supply Shuttles and High Bollard Pull AHTS *M. Welch, Siemens; P. Kavli, Greenships AS*
0955	24433	*M.P. Seixas, M.R. Barretto, C.B. da Cunha, M.A. Brinati, A.B. Mendes, University of Sao Paulo; R.E. Cruz, Petrobras*
1020	24467	The Hybrid Propulsion System as an Alternative For Offshore Vessels Servicing and Supporting Remote Oil Field Operations *R. Barcellos, Wartsila*
1045	24496	Technical-Commercial Project Management: A Challenge for Oil Companies *F. Jefferson, TechBusiness*
1110	24295	Improving Service Reliability for Drilling and Evaluation Operations Using an Optimized RCM Strategyy *J.J. Cho, K.D. Rice, R.G. Phillips, Baker Hughes*

Session 39: Thursday, 31 October 2013
Drilling and Completion Fluids

Session Chairpersons:

• Philip Souyris, *Schlumberger* • Rosana Lomba, *Petrobras*

0930	24355	Lessons Learned in Drilling Pre-Salt Wells With Water Based Muds *R.F. Lomba, G.T. Teixeira, R.R. Pessanha, B. Lomba, M. Folsta, W.F. Cardoso Jr, J.T. Goncalves, Petrobras*
0955	24434	Development of Worm-Like Micelles as Drag Reducers in Completion Operations *R. Rodrigues, E. Sabadini, Universidade Estadual de Campinas; M.G. Folsta, A.L. Martins, Petrobras*
1020	24345	Use of Salt Dissolution Software To Evaluate Drilling Strategies of Massive Salt Layers *R.F. Lomba, M.G. Folsta, E.L. Resende, Petrobras; D.M. Plucenio, C.É. Dannenhauer, ESSS*

1045	24405	Evaluating an Alternate Cuttings Separation Technology: Is the MudCube a Fit for Brazilian Offshore Drilling? *C.M. Panisset, B. Lomba, E. Souza, A.L. Martins, Petrobras ; A. Kroken, J. Vasshus, Cubility*
1110	24377	Microwave Drying of Drilled Cuttings *M. Pereira, M. Barrozo, C.H. Ataide, Universidade Federal de Uberlandia; R. Naufel, ONDATEC; C.M. De Sa, A.L. Martins, C.M. Panisset, Petrobras*
1135	24336	Selecting Appropriate Lubricants for the Reservoir Section: A Customized Solution for Peregrino Field -- Offshore Brazil *F. Fornasier, J. Luzardo, D. Clinch, Halliburton*

Session 40: Thursday, 31 October 2013
Offshore Exploration

Session Chairpersons:

• Pedro Zalan, *ZAG Consultoria* • Diego Gracioso, Shell

0930	245245	A Study on Brazil's New Peak Oil: an Analysis and Update on Current Brazilian Peak Oil Quantitative Models and its Implications *R. Rueda, Total; C. Cohen, UFRJ/IE; A. Souza, R. Perciliano, Estácio de Sá University*
0955	24361	New Deepwater Frontiers in the South Atlantic Equatorial Margins *M.R. Mello, N.C. Azambuja Filho, A.A. Bender, HRT ; S.M. Barbanti, T. Takaki, IPEX; C.A. Fontes, GeoHub; W. Mohriak, Consultant*
1020	24422	New Exploration Frontiers of Brazil's Atlantic Margin: From Theory to Reality *M.D. Wittstrom, K. Miura, D. Orange, Niko Resources; H. Borges, SeaSeep Petroleum Data Ltd; B. Leonel, P. Fávera, Niko Resources; R. Fainstein, WesternGeco International*
1045	24320	An Evaluation of Seismic Response of a New Generation Ocean Bottom Seismometer For Large-Scale Operation *S. Shimizu, T. Maekawa, Nippon Marine Enterprises, Ltd.; Y. Watanabe, N. Takahashi, K. Hatakeyama, Japan Agency for Marine-Earth Science and Technology*
1110	24490	Seismic - Deep Reading Electromagnetics Integration Takes on Deepwater Risk *A. Zerilli, Schlumberger ; M. Buonora, Petrobras*
1135	24358	Optimized Well Path Planning Decisions in Real-time Monitoring Operations *C.M. Falcone, C. Correa Born, J.D. Lonardelli, O.N. de Lima, Petrobras; W.G. Ney, Halliburton*

Session 41: Thursday, 31 October 2013 1215 - 1345
Topical Luncheon 4: Local Construction of 28 New State-of-the-Art Drilling Rigs

Speaker:

• João Ferraz, *Sete Brasil*

Session 42: Thursday, 31 October 2013 1215 - 1345

Topical Luncheon 5: Local Content and Petrobras Vendor Registration

Speaker:

- Paulo Alonso, *Petrobras*

Session 43: Thursday, 31 October 2013 1400 - 1630

Well Integrity II

Session Chairpersons:

- Clemente Jose Gonçalves, *Petrobras*
- Jose Gregorio Gonzalez, *Schlumberger*

1400		Improving Well Integrity in Reservoirs With High H_2S and CO_2 Content in Brazil Deepwater Fields *N.A. Paton, Halliburton*
1425		Well Integrity Barrier Verification is Enhanced by New Logging Measurements *S. Rajagopalan, Schlumberger*
1450	24515	Well Integrity Monitoring: Challenges and Perspectives *H.L. Pinto, Petrobras; A.M. Braga, P.M. Gouvêa, PUC-RIO*
1515	24514	Workflow For Wellbore Integrity Analysis During Reservoir Deveplopment *S. Fontoura, C.R. Lautenschlager, G.L. Righetto, N. Inoue, R.A. Albuquerque, Pontificia Universidade Catolica; C.J. Gonçalves, M. Alcure, Petrobras*
1540	24369	Well Integrity Analysis Applied to Workover Prediction *T.C. da Fonseca, K. Miura, Petrobras; J.P. Mendes, Universidade Estadual de Campinas*
1605	24335	Risk-Based Well Integrity Management *M. Sengul, Schlumberger*

Session 44: Wednesday, 30 October 2013

Panel Session: Offshore Logistics

Session Moderators:

- Orlando Ribeiro
- Cinthia Caldas dos Santos, *Petrobras*

Panelists:

- Marcus V. E. D'Elia, *Senior Manager, Instituto de Logística e Supply Chain (ILOS)*
- Nathalia da Silva Sena, *Technical Consultant, Petrobras*
- Mario Faria, Vice *President for Shared Services Latin America, Schlumberger*
- Knut Magne Johannessen, *Director International & Project Operations, NorSea AS*
- Martin Swerdlow, *Managing Director, Tracked Assets Limited*
- Bjørnar Aas, *CEO, X2X MARITIME AS*

Session 46: Thursday, 31 October 2013
Subsea and Facilities

Session Chairpersons:

• Robert Voss, *GE Oil & Gas* • Joao Melo, *Oceaneering International*

1400	24371	World's First Installation of an Electro-Hydraulic Wet Disconnect Tool Offshore Brazil *F.R. Gutterres, H.L. Pinto, R.G. Izetti, Petrobras; M.L. Staelens, L.B. Minassa, R. Vayeda, B.E. Deyo, A. Bonfim , M.A. Batocchio, Halliburton*
1425	24440	New Subsea Safety Tree for Extreme Environments Successfully Meets Challenges in Brazil for Drill-Stem Testing/Fracturing Jobs *L. Rubio, H. Nolasco, F. Marcancola, Halliburton; R. Barcelos, Petrobras*
1450	24448	Submarine High-Voltage Power Transmission: Challenges & Opportunities *R.W. Voight, INTECSEA*
1515	24461	Advances in Autonomous Deepwater Inspection *D. Mcleod, J. Jacobson, Lockheed Martin*
1540	24367	Improved Recovery Rate in Brownfield Subsea Wells Using Riserless Light Well Intervention *O. Karlsen, B.J. Morrison, P. Maciel, Welltec*
1605	24269	Drill Pipe Riser Intervention System Successful Experience in Offshore West Africa *H. De Fonvielle, L. Bordet, VAM Drilling; W. Campbell, N. Susak, Total; M. Marajh, FMC Kongsberg*

Session 47: Thursday, 31 October 2013
Flexible and Umbilicals

Session Chairpersons:

• Felipe Lamego, *Deepflex* • Thiago de Carvalho, *Shell*

1400	24306	On the Specifications of Flexible Composite Ball Socket Joint Pipe Characterized by Barrel Shell Model *T.M. Albarody, Z. Bt Mustaffa, Universiti Teknologi PETRONAS; M.B. Taufiq, the University of Mustansiriyah*
1425	24328	Precise High Speed Stochastic Fatigue Evaluation of Risers Applying 2D Hysteresis Models *C. Hoen-Sorteberg, C. Arnholm, P. Gundersen, Kongsberg Oil & Gas*
1450	24468	Qualification of Polymer Materials for High Pressure CO_2 in Flexible Pipe Structures *C. Wang, A. Rubin, NOV; N. Von Solms, Technical University of Denmark*
1515	24450	Nonlinear Dynamic Simulation of Flexible Risers with Multi-Layered Pipe Models - Part 1 *A. Majed, P.A. Cooper, INTECSEA*

1540	24309	Recommended Practice for Unbonded Flexible Pipe Employing Composite Armor Materials *T. Barbosa Neto, L. Yu, M. Kalman, DeepFlex*
1605	24311	Application of Numerical Analysis Tools on the Performance Improvement of Umbilicals and Their Elements *W.N. Mascarenhas, J.F. Andrade, R.S. Almeida, A.F. Andrade, MFX do Brasil*

Session 48: Thursday, 31 October 2013
Materials Performance II

Session Chairpersons:

• Riad Asfahani, *United States Steel Corporation* • Pascoal Bordignon, *CBMM Consultant*

1400	24435	Hydrogen Enhanced Cracking (SSC, HIC, CF) of Tubulars and Pipelines for Sour Service in Deepwater and Seabed Applications *B.J. Connolly, M. Walters, D. Horspool, R. Doyle, University of Birmingham; P. Dent, C. Fowler, Exova Group Ltd.*
1425	24289	On the Role of HISC on Super and Hyper Duplex Stainless Steel Tubes *F. Salvio, B.R. S. Silva, D.S. dos Santos, Universidade Federal do Rio de Janeiro*
1450	24356	Advanced Forging Process (AFPTM), Super Duplex Stainless Steel for Increased Low Temperature Impact Toughness and Resistance to Hydrogen Induced Stress Corrosion Cracking (HISCC) Due to Cathodic Protection of API Forgings for Subsea Applications *Z.J. Schulz, Rolled Alloys; G. Warburton, NeoNickel; D. Byrne, Rolled Alloys; R. Francis, RF Materials*
1515	24438	Inhibitor Dosage Rates and Corrosion—A CFD Model Investigating Inhibitor Over-Dosing and Increased Corrosion Rates in Subsea Pipelines *D. Peng, I. Annan, A. Salami, T. Wood, A. Taylor, H. Ndione, INTECSEA; S. Jones, Independent Consultant*
1540	24493	Optimization of Corrosion Resistance and Weldability: A Challenge for Superduplex Filler Metals *V. Gross, B. Hoberg, BSDG; D. Zinke, University of Magdeburg*
1605	24296	Design and Modeling of Elastically Reeled Pipes as a Double Curved Laminated Composite Shell *T.M. Albarody, Z. Bt Mustaffa, Universiti Teknologi PETRONAS; M.B. Taufiq, The University of Mustansiriyah*

Session 49: Thursday, 31 October 2013
Local Content

Session Chairpersons:

• Alceu Mariano, *Keppel FELS* • Alberto Machado, *ABIMAQ*

1400	24421	A Critical Assessment of the Main Challenges Related to Feasibility Studies, Risk Analysis and Monitoring of Current Offshore Projects in Brazil *A. Prates, Forship Engenharia S.A.; A. Freigedo, P.O. Almeida, Aquapar Consultoria Naval.*
1425	24474	Three Dimensional Project Management in the Age of Local Content - Optimization of Local Content, Lead Time and Cost *S. Awasthi, FMC Technologies; S. Kozio, Tomé Engenharia*
1450	24280	National Content in Brazil - An Ongoing Initiative With Cost-Effective Results *C. Gama, J. Firmo, Schlumberger*
1515	24339	Regulatory Challenges of Local Content Rules in Brazil *M.O. Mirilli, Vieira de Castro & Mansur Advogados Associados*

Session 50: Thursday, 31 October 2013
Deepwater Drilling and Completion Challenges

Session Chairpersons:

• Felipe Freitas, *Stress Engineering Services* • Sidney Bereicoa, *ABS*

1400	24275	Real-Time Drilling Data Diagnosis Implemented In Deepwater Wells - A Reality *R.A. Gandelman, A.L. Martins, G.T. Teixeira, A.F. Aragao, Petrobras ; R.M. Castaneda, D.G. Lins, C. Lenz, P. Ghilardi, A. de Mari, ESSS*
1425	24462	A Hybrid Model for Predicting the Likelihood of Differential Sticking in Offshore Wells *A. Lourenco, Baker Hughes; J.H. Sampaio, BG Group*
1450	24418	Emergency Disconnection Guidelines *R. Junior, D. Fonseca, Petrobras*
1515	24291	Deepwater Conductor Pre-Installation for First TLWP in Brazil *A. Silvio, J.C. Ruiz, M.F. Pereira, InterMoor*
1540	24407	How Hard Rocks Under High Stress Levels Behave Upon Drilling *E.S. Santos, C.J. Gonçalves, Petrobras*
1605	24447	Practical Experience Gained Operating a Compact Ultradeepwater Drill Ship *D. Roodenburg, J. Roodenburg, D. Wijning, Huisman Equipment BV*

Session 51: Thursday, 30 October 2013

Panel Session: Advanced Geophysical Technologies for Sub-Salt and Pre-Salt Reservoirs Characterization and Monitoring

Session Chairpersons:

• Paulo Johann, *Petrobras* • Hamish Macintyre, *BG Group*

1400		Challenges in Reservoir Characterization of Pre-Salt Oilfields in Offshore Brazil *Paulo R. Johann, Petrobras S.A.*
1425		Seismic and Non-Seismic Technologies Relevant to Sub and Pre-Salt Exploration and Production *Luiz Braga, CGG*
1450		Geophysical Technologies at Sub and Pre-Salt Reservoirs *Guillaume Cambois, PGS*
1515		More Measurements, More Sources: Implications of Recent Advances in Marine Technology *Craig J. Beasley, WesternGeco*
1540		3-D Multi-Azimuth Seismic Technologies for Campos Basin Pre-Salt Reservoirs *Diana Sineva, Repsol Sinopec Brasil*
1605		Instantaneous 4D Seismic (i4D) for Offshore Reservoir Surveillance *Kanglin Wang, Shell*

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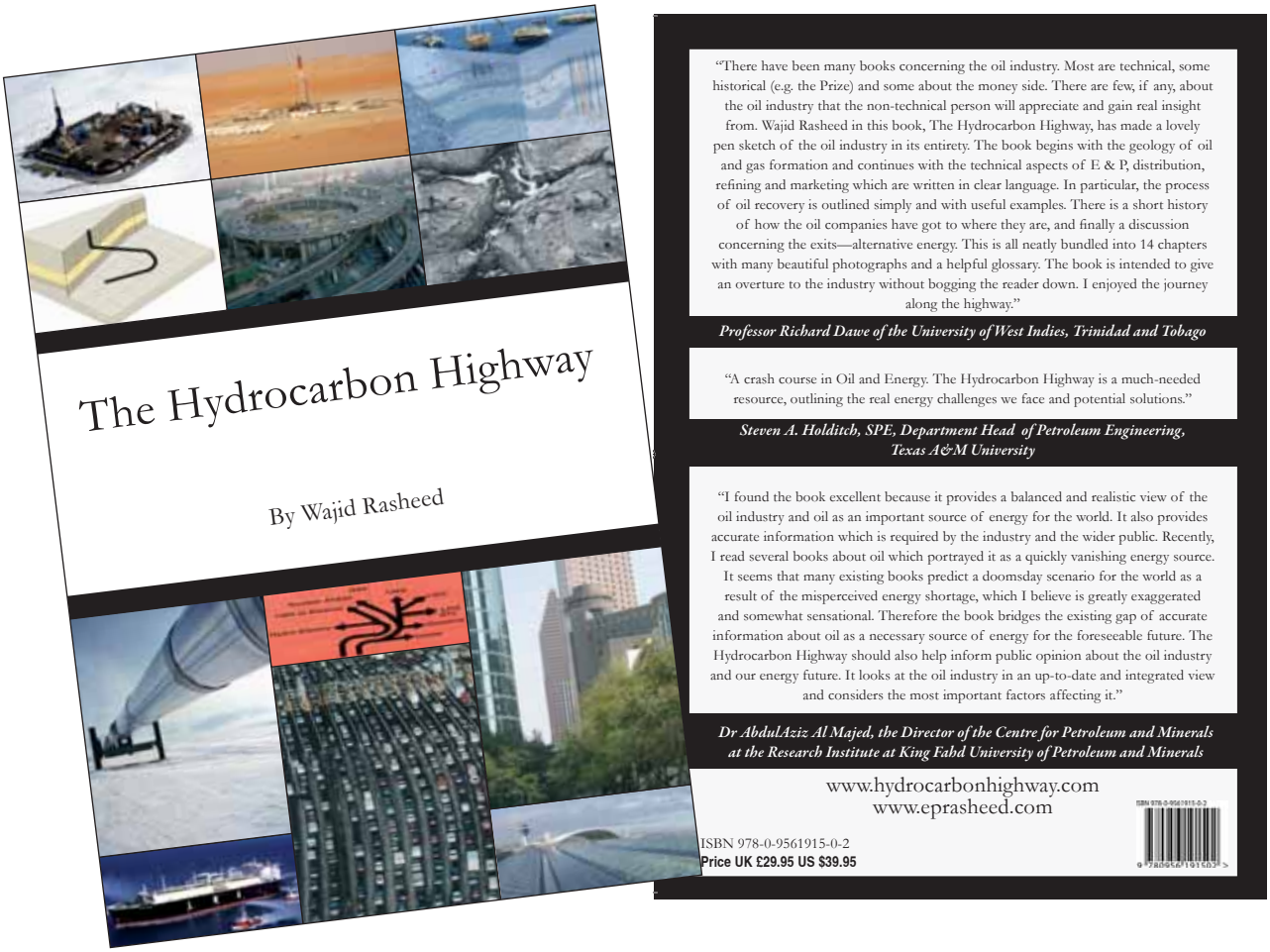
Paper Barrels – Oil and Gas Markets

A Chapter from The Hydrocarbon Highway, by Wajid Rasheed



'Please Lord, give us one more boom. We promise we won't screw it up this time'.

Trading of paper barrels, such as oil futures and oil derivatives, characterise today's oil and gas markets and add further volatility to oil prices. The trillions of dollars that are found in hedge funds operated by commodity traders and speculators often follow a herd mentality. This magnifies the effects of geopolitical unrest or natural disasters by creating panic buying or selling situations. Hedge funds and speculators need prices to oscillate to make profit – buy low, sell high and buy low[1].

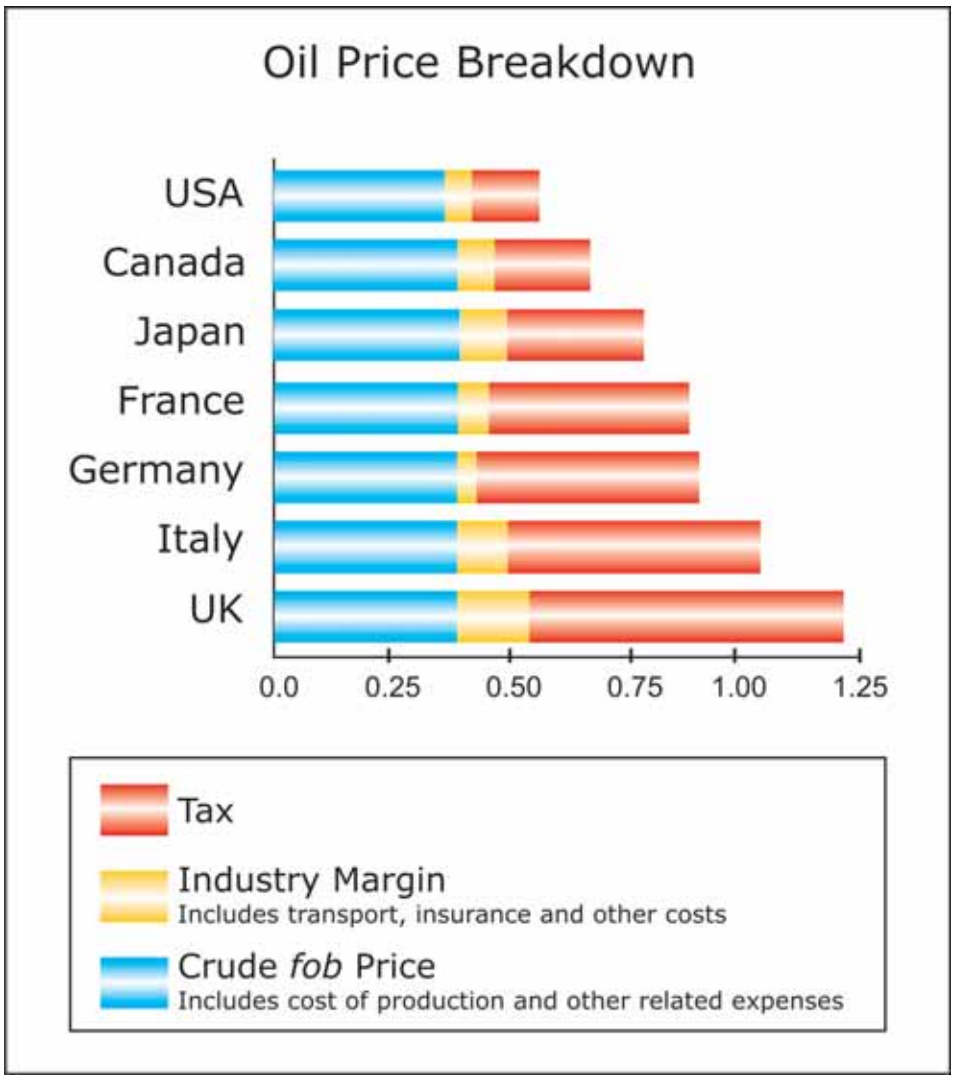


Figure 1 - Oil Price Breakdown (OPEC)

Nature's Best

You don't have to trade commodities to know the simple rule: the best quality fetches the highest prices. Just go down to a coffee shop; the best beans command a premium. Oil is no exception to the quality rule, yet the prevailing stereotype is that a group of oil barons in Dallas or oil sheiks in Dubai control prices behind closed doors. Thankfully, the reality is somewhat more transparent with petroleum prices being determined by market forces, quality and trading.

Pricing Is Complex

The pricing of petroleum is highly complex. Making comparisons between producers regarding what is a fair price for oil and gas is a tough call. This is because it would involve selecting countries that match each other's profiles in terms of oil and gas exports and imports. Almost all petroleum exporters import petroleum either for derivative needs or to maintain refining blends for national refineries. Even then, the comparison would be invalid due to differing circumstances such as:

- Fiscal arrangements
- Production agreements
- Royalties
- Tax breaks
- Seasonal adjustments and their affect on West Texas Intermediate (WTI) crude (which does not necessarily apply to Brent crude)
- Discounts and sunk costs for a certain type of refinery configuration for a certain basket of crudes
- Per barrel finding costs, and
- The sweetness and density of the crudes being imported and exported[2].

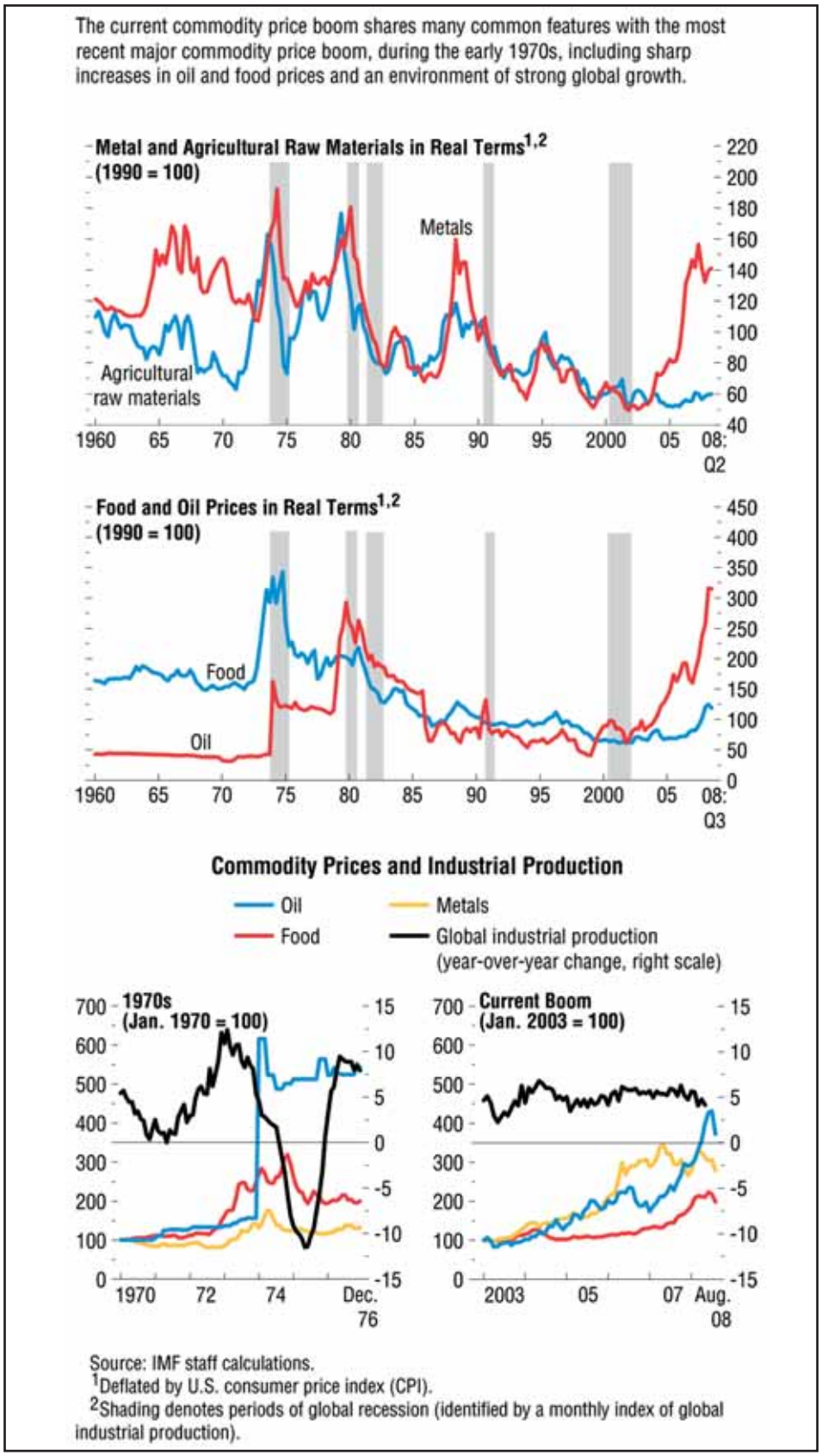


Figure 2 - IMF Commodity Prices (Source IMF). Note the commodity boom clearly burst in late 2008

Figure 3 - When You Can See the Iceberg It's Too Late to Change Course.

The following example is instructive. Consider that sweet WTI crude trades at US $X on a given day. WTI Sour would trade at a lower rate between US $3.75 to $5.00; therefore, WTI Sour would trade at approx. $X-$3.75 to $X-$5.00. A sliding scale operates that knocks down the price according to sourness. A 50° API sour would trade at approx US $68.25 per barrel although the marker WTI would trade parallel at US $90 – a price differential of nearly US $22. Additionally, crude that is below 25° API, would fetch lower prices. Roughly speaking, 20 cents is deducted for each API degree below the benchmark. For crude below 20° API, 70 cents would be deducted for each API degree[3]. This gap is likely to increase in the future due to the shortage of sour and heavy refineries.

Petroleum pricing is further complicated due to variations in the type of oil company, its internal marketing channels, the age of refineries involved as well as their configuration, efficiency, ownership, economies of scale and sunk costs[4].

Oil and Gas

The split between oil and gas production is always important because oil and gas are priced according to their nature and utility. Gas pricing is different to crude oil pricing mainly due to the long-term contracts which can be as long as 20 years, a situation which is unthinkable in oil futures. Even the most progressive and forward thinking oil companies or oil traders will not likely contract beyond a few years. This leads us to the second fact: differences exist in oil contracts between oil companies and traders and oil contracts 'off-the-trading-floor'. The latter are not hushed up for secrecy purposes, but for more mundane reasons – getting the right blend for refining[5].

Trading

Every day billions of dollars worth of petroleum contracts are traded at exchanges around the world. The most famous are those of the New York Mercantile Exchange

(NYMEX), Chicago Mercantile Exchange (CME) and the Intercontinental Exchange (ICE) London. These exchanges act as trading venues by bringing buyers and sellers together. These exchanges do not control price, nor can they intervene to stimulate demand or supply. What they offer is the certainty and anonymity of a regulated trading place. Today's corporate governance and anti-trust laws make price fixing and monopolies a historic relic. Regulated contracts are generally either here-and-now (spot) contracts or set at a pre-determined date (futures). These contracts allow buyers and sellers to hedge against future risk, oil price increases or reductions. Hedging or speculative investments are unregulated financial instruments where traders look for a 'margin' between market value and real value. Their profits are made when the values differ[6,7,8].

Auto-Pilot

Bright blazers, frenzied finger signs, shouting and paper strips littering the floor – the unmistakable scene of open pit trading. In 2005, London's open-pit petroleum exchange became completely e-based. Buyers and sellers instruct brokers who set e-tag alarms at given bid-to-buy or offer-to-sell levels. This has removed much of the human element in petroleum trading making it almost automatic execution. Although this removes an element of panic, prices are still influenced by volume transactions or the 'herd' mentality. The NYMEX still maintains open pit trading, but it is only a matter of time before this too becomes automated.

Control or Influence?

No single body, organisation or even nation state is capable of controlling oil prices without inflicting major harm on itself. If a trend for oil prices has been established, and is achieved by all the world's producers and consumers, this trend can only be undone by the same combination. Of course, certain institutions may be able to influence the trend, but the underlying trend is far too diverse and powerful to be broken. Not even the world's financial muscle can control oil prices. Banks and billionaires can clearly influence prices by buying and hoarding physical oil stocks. They can suddenly offload oil at high prices, and buy it back at a lower price; however, the daily volumes involved just to make a difference would be huge (one million barrels a day [MMbbl/d] would cost many millions of dollars). Considering, the severity of the current banking crisis, it is hardly likely either banks or billionaires will want to hold substantial volumes of oil.

To see the trends clearly, consider that by the end of 2008 the Organisation of the Petroleum Exporting Countries (OPEC) had promised a production cut of two MMbbl/d – the largest cut in its history. Yet, this had minimal impact on the downward trend. To contrast, in early 2005 in certain European markets, some finance houses profited from rising oil prices by chartering oil tankers and storage facilities to hoard oil; however, they were profiting from an upward trend not creating one and were able to access capital easily.

Even the powerhouse of OPEC, which supplies roughly the equivalent of 40% of the world's crude oil, is unable to determine prices. Of course, OPEC and its constituent state companies influence the market by increasing or decreasing production. They cannot, however, reverse or start a trend that is already underway[9,10,11].

But what if suppliers increased production in an upward-market? In theory, this should send prices spiralling downwards due to excess supply. In reality, however, the supply-demand equation is so tightly reckoned that insufficient spare capacity exists that could actually pump more oil or gas, let alone refine, market and distribute it. What if the suppliers reduced production in an upward-market? Of course, this would increase prices. In the normal course of business, however, this is not likely as producers want to make the most of high prices.

If oil prices become too high, this will induce inflation and restrict global growth, reducing consumption and bringing prices downwards. The oil producers seek stability; they are highly dependent on oil and gas revenues. If supply was shut off completely, that would send economic shockwaves worldwide as in the 1970s. While it may be possible, this is not likely to happen in the normal course of business[12].

On the demand side, as long as world economies continued to grow (even at very low rates, i.e. 0.25% per annum), oil demand does not falter and oil prices maintain their high levels. However, as soon it was clear that world economies were going to falter in late 2008, demand dropped so fast that by early 2009 the oil price was US $40 per barrel. This was a drop of more than US $ 100 within less than six months.

Consumers and Producers Dance Together

Consumers and producers are locked in a complex and inescapable equation that continually attempts to balance trillions of supply and demand transactions.

Petroleum pricing is further complicated due to variations in the type of oil company, its internal marketing channels, the age of refineries involved as well as their configuration, efficiency, ownership, economies of scale and sunk costs

To comprehend this, we need to look beyond politics and realise that producers and consumers are mutually dependent. Although certain countries hold the world's long term oil and gas reserves, those reserves are only ever of real value if they are marketed.

Giant consumers such as the US, Europe and China need to meet demand for heating, cooling, lighting and mobility. Other consumers such as Brazil and India are growing demand. As demand is so heavily dependent on economic health, any change in consumption will affect producer decisions regarding production output, exploration spending, etc. That much seems clear.

What is not clear is the time delay between a growth or fall in consumption and the reactions of producers. Not only is this delay so protracted that it goes unnoticed, it is also deadly. Why are we consistently unable to spot the dangers of 'boom and bust' cycles? Since biblical times, and the seven years of feast followed by seven years of famine, why is it that we always get hit?

Just like the Titanic and the iceberg, it seems as if the cycle has suddenly come from nowhere. Bang. By the time we get hit, it is too late to change course. But is our fate the same as that of the Titanic[13]?

Large economic swings leading to excess production or consumption are not in the interests of producers and consumers. They can lead to recession and even depression; therefore, it is in the interests of both groups to maintain stability. Ultimately, however, the market balances the uncertainties of economic growth and oil price. But how does this affect the oil and gas industry?

Cycles

Clearly, the major determinant of oil company profits and share prices is the oil price. As such, it is a crucial factor in pacing industry activity. It dictates budgets and investment throughout the industry from E & P spending, rig activity, wells, facilities, refineries and pipelines. It is relatively easy to see where the industry is in a given cycle by looking at oil prices. If they are low, so are share prices, capital expenditures, rig levels, drilling and activity in general. When oil prices rise, the opposite applies[14].

From an investor's perspective, ExxonMobil, BP, Royal Dutch Shell and ChevronTexaco all enjoyed an increase in absolute values in line with high oil prices and record corporate profits. Independents and service-company stocks had a similar story. Anadarko, Burlington, Baker Hughes, Halliburton, Schlumberger, Smith

As demand is so heavily dependent on economic health, any change in consumption will affect producer decisions regarding production output, exploration spending, etc.

and Weatherford experienced relatively large gains. Both majors and services, however, had tremendous fluctuations in unison with cycle movements thus wiping off billions in market share values as oil prices dropped in late 2008.

Down Cycle

But how does that affect the industry? It's no secret that markets are ruthless. Since the 1970s, the boom and bust cycles have seen oil prices and drilling activity crash three times – twice due to the wider recession in the world economy and once due to the Arab-Israeli war. Two clear patterns emerge from these cycles. First, just like the market traders, the upstream industry is dominated by a herd mentality too. Despite bust markets offering less expensive stocks, rigs and labour, drilling levels never rise; they fall. Second, the industry is regulated as if it were a tap. Despite experience reminding us that cycles do not last forever, the tap is opened or closed, and the flow that follows always compounds the boom or bust [15].

To illustrate this, since the US $10 oil price in 1998, basket crude prices doubled to above US $20/bbl by 2000, doubled again to US $40 by 2004 and nearly doubled again reaching US $78.40 in 2006. By July 2008, they had reached a peak of US $147. Although oil prices have more than doubled three times since 1998, exploration spending has only increased marginally in comparison.

Despite lower E & P budgets relative to the increase in oil price, most rig contractors and oilfield service companies have all recorded record profits and high utilisation levels. The reason is that demand for equipment and services has been very high and technological forces have also been at play.

We have seen that fewer wells are being drilled, but they are far more effective at drainage and production is increased. Better technology such as sub-salt imaging is helping to discover fields such as Tupi in Brazil, while directional drilling techniques can access and enable multiple reservoir completions. Yet, once again faced with uncertain economic conditions, the industry is faced with cost-cutting[16,17].

Big Crew Change

Arguably the industry's most valuable resource, upstream labour, suffers the most when the tap closes. The 'big crew change' refers to an ageing population that is creating a labour deficit across all skills and capacities, but is largest in technical areas. Many people who are laid off exit the industry and potential new entrants remain wary. Today, nearly half of all oil and gas industry workers are over the age of 50. Only 15 percent are in the age range of 20s to mid-30s. University enrolment in petroleum engineering is down from 11,000 students in 1993 to 1700 today. The number of universities with petroleum engineering degrees has fallen from 34 to 17. Companies searching for their

future leaders are fast realising they are going to have to do things differently; there are lots of intellectual gaps. We're seeing more outsourcing, greater dependence on suppliers to solve problems and higher demand for consultants[18].

Oil – Profits or Profiteering?

Rocketing oil and gas prices and record corporate profits are almost always accompanied by the pockets of consumer's hurting. This leads to greater scrutiny of oil and gas companies, yet what are the issues surrounding petroleum prices and corporate profits[19]?

Nobody wants oil or gas. What people want is the progressive lifestyle that oil and gas provides. It's all about comfort, freedom and consumption. We want the 'climate-comfort' that comes from heating or cooling our homes, our workplaces and malls. We want the freedom that comes from driving our cars or from flying anywhere. We want derived goods such as aspirin, plastics and cosmetics. No other commodity touches us so completely or underpins modernity as petroleum. Undeniably, we are 'petroleum people'.

As the desire for modernity spreads, lifestyles that were once confined to wealthy classes in wealthy countries are now found up and down social classes and across the globe—not just China, India, Russia and Brazil but the wealthy states of the Middle East. Together, this relentless social mobility has contributed to oil becoming in many ways the world's most desired commodity [20].

Petroleum Generation

Emotions run high because everyone wants a better lifestyle or at least a more comfortable one, and oil and gas can make this happen. It's that simple. If we strip away our needs from our wants, however, it becomes clear that we do not need everything we want. Linked to this, we can also use energy more efficiently.

Of course, no one is suggesting that air-conditioning in the tropics (gas power generation) is unnecessary or that heating (gas fired) in cold countries is a luxury. What is important here is that we don't need to drive everywhere, but we want to. It just seems easier to get to the shops, to work and to the gym. Our language is telling; often our first car is a little 'runabout' for local journeys[21].

As petroleum people, we drive everywhere – no matter how short the distance – and we fly. Where past generations would have seen flying as a once in a lifetime experience, we think nothing of flying to visit people, go shopping or even to get a 'winter-tan'.

Lifestyle Price

It's fine that lifestyles come with a price. The logical question is at what price and who should pay. The logical tendency is that those that pollute should pay. What this means is that those people that live in Northern climates must get used to paying higher prices, especially during peak demand periods such as winter. Those that inhabit temperate climates will pay more for their energy, especially in summer. Everyone can expect higher gasoline prices. As students of economics will be quick to point out, this is demand and supply theory at work. In this context, what is a fair price for the lifestyle? All commodities can fluctuate wildly according to seasonal production changes and non-scheduled events such as droughts or flooding. See the peaks and troughs of orange juice or coffee futures; where crops are plentiful, prices fall. The reverse is also true. Without exception, oil and gas are commodities which are subject to price fluctuation[22].

Cheap Oil

Getting it on the 'cheap' is a reality for only a handful of countries that 'enjoy' heavily subsidised oil such as Venezuela and several Arabian and central Asian states. Of course, the artificially low prices that these countries enjoy mean that part of oil revenues are transferred directly to consumers' pockets. Some commentators have decried this as distorting demand by allowing artificially low prices which lead to greater demand. That may be true, but the decision to remove taxes from gasoline sales in given countries is a sovereign decision and right. In some ways, it is an easy method of spreading the profit.

It is clear that the oil price is determined globally by many buyers and sellers engaging in trillions of transactions: however, the time-delay before we can measure the difference is so long that it often catches us by surprise (who remembers the last bust cycle when it was a decade ago?) This is best characterised by the Texas car sticker—'Please Lord, give us one more boom. We promise we won't screw it up this time'.

In the long term, as long as economies and populations grow, demand will inevitably increase. On the supply side, three major world producers—Venezuela, Iraq

and Nigeria – have had reduced production for four successive years. Add to this the spate of hurricanes and other non-scheduled events to use an analyst's term, it's hardly a surprise that oil and gas peaked recently.

But what is the trend for the future? Will renewables change the equation? What of global warming and climate change? The next chapter looks at these two points specifically. By understanding where renewables fit into the oil and gas equation, we will be better placed to understand which are the true exits from the Hydrocarbon Highway[23].

References

1. The cycle can be self-fulfilling and examples are the 'contango' situation in oil futures where spot prices are lower than long term futures or backwardation where spot prices are higher than futures.

2. The difference between imports and exports can make a huge difference to profits.

3. This is a guideline pricing differential for illustration only.

4. Planned maintenance is a growing problem as the refinery stock ages.

5. With increased volumes of heavy and sour oil blending and purchasing is already becoming a complex trading task.

6. The New York Mercantile Exchange handles billions of dollars worth of energy products, metals, and other commodities being bought and sold on the trading floor and the overnight electronic trading computer systems. The prices quoted for transactions on the exchange are the basis for prices that people pay for various commodities throughout the world.

7. The Chicago Mercantile Exchange was formed in 1919. Initially, its members traded futures contracts on agricultural commodities via open outcry. This system of trading – which is still in use today – essentially involves hundreds of auctions going on at the same time albeit with today's electronic option available too.

8. ICE conducts its energy futures markets through ICE Futures Europe, its U.K. regulated London-based subsidiary, which offers the world's leading oil benchmarks and trades nearly half of the world's global crude futures in its markets.

9. The oil and gas markets are simply too large for any single group to control prices.

10. There would be too many variables between OPEC and non-OPEC producers let alone considering consumer countries.

11. TTNRG Nature's Best.

12. This would hurt producers equally with the loss in revenues.

13. The Titanic sank for good; oil and gas markets go up and down

14. Harts E & P Sept 2002 Drilling Column. 'Manage your tapped resources'. Discussion on industry cycles.

15. Idem.

16. Despite economic uncertainty certain deepwater projects are still going ahead.

17. See Yergins Prize 'Sweating'.

18. The Big Crew Change.

19. See 2005 US Senate Inquiries into Oil Prices.

20. Global economic growth has slowed down during the current recession but it will not disappear.

21. The comfort lifestyle.

22. See IMF commodity price charts.

23. This is the basis for substituting oil.

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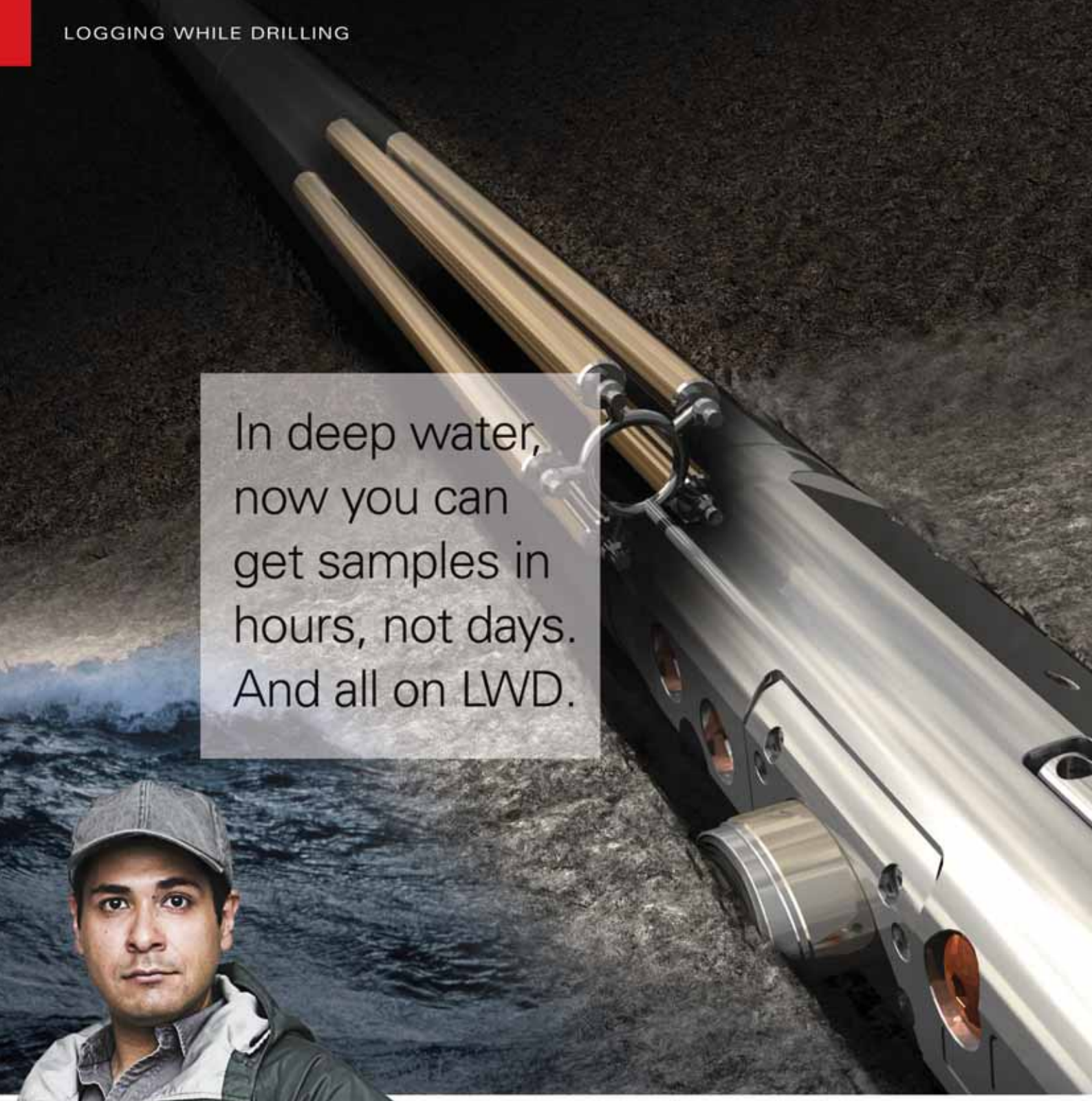

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