

## Monday, 5 May 2014, 0930–1200

### 001 Emerging Offshore Geosciences Technologies

306

A panel of thought leaders in geoscience will present and discuss their executive summary views on emerging geoscience technologies showing potential for commercial game-changers in offshore technology. Discussion will include: permanent reservoir monitoring, microseismic technologies, new streamer technologies, and ocean bottom acquisition.

Session Chairperson(s):

Charles Knobloch, Arnold, Knobloch & Saunders LLP

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| 0930 | Speaker - Paula Johann<br>P.R. Johann, Petrobras America Inc.                |
| 0930 | Speaker - Shuki Ronen<br>S. Ronen, Seabird Geosolutions                      |
| 0930 | Speaker - Peter Duncan<br>P. Duncan, MicroSeismic, Inc                       |
| 0930 | Speaker - Rocky Detomo<br>R. Detomo, Shell International E&P Co.             |
| 0930 | Speaker - David Monk<br>D.J. Monk, Apache Corp.                              |
| 0930 | Moderator - Charles Knobloch<br>C. Knobloch, Arnold, Knobloch & Saunders LLP |

### 002 Dual Gradient Drilling/Managed Pressure Drilling

604

In many cases, conventional drilling does not permit economic completion of deep wells. Dual gradient drilling is one technology with significant potential to overcome this hurdle. It takes advantage of the long riser in the water column as a tool for managed pressure drilling, and so has emerged as a very desirable way of implementing managed pressure drilling in deepwater wells.

Session Chairperson(s):

Syed Ali, Schlumberger

Francois Auzeais, Schlumberger

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|------|-------|---|
| 0930 | 25164 | Live Well Display & Automated Data Analysis to Improve Timely Well Control & Drilling Optimization Decision-Making in MPD Operations<br>F. Gumus, D.M. Hannegan, I. Pobedinski, Weatherford; K. Valiullin, Weatherford International Inc.; D. Simpkins, Weatherford |
| 0952 | 25222 | Implementation of Dual Gradient Drilling<br>R. Stave, AGR Enhanced Drilling   |
| 1014 | 25292 | ECD Management Toolbox for Floating Drilling Units<br>J. Godhavn, Statoil North America Inc; E. Hauge, D. Molde, I. Kjoesnes, Statoil ASA; S. Gaassand, Statoil North America Inc; B. Fossli, R. Stave, AGR Enhanced Drilling                                       |

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| 1036 | 25256 | Enhancing Well Control Through Managed Pressure Drilling<br>M.S. Culen, O. Gabaldon, P. Brand, Blade Energy Partners  |
| 1058 | 25267 | Dual Gradient Drilling Is Ready For Primetime: The Benefits Of A Retrofit System For Better Well Control, Enhanced Water Depth Capability And Flat Time Reduction.<br>R.F. Ziegler, Petronas  |
| 1120 | 25290 | Managed Pressure Drilling Probabilistic Risk Analysis: An Illustration<br>K. Zan, J.E. Bickel, The University of Texas At Austin  |
| 1142 | 25360 | Dynamic Simulations of New Well Control Procedures Used to Prepare a Dual Gradient System for Field Trial<br>J.H. Cohen, AGR Subsea, Inc.; J. Godhavn, Statoil Gulf Services LLC; E. Hauge, Statoil ASA; R. Stave, AGR Enhanced Drilling; D. Molde, Statoil ASA |

### **003 Computational Fluid Dynamics- Applications in Offshore Engineering**

#### **602**

This session focuses on the practical applications of computational fluid dynamics (CFD) in offshore engineering, including the design, installation, and operation of offshore platform, riser, flowline, and subsea equipment. While CFD is known to model physics more accurately than conventional engineering analysis tools, its application in the field of offshore engineering has been limited so far, largely due to excessive computing cost in the past. This session focuses on the practical applications of computational fluid dynamics (CFD) in offshore engineering, including the design, installation, and operation of offshore platform, riser, flowline, and subsea equipment. While CFD is known to model physics more accurately than conventional engineering analysis tools, its application in the field of offshore engineering has been limited so far, largely due to excessive computing cost in the past. With recent developments of computing hardware and software, we have seen increasing application and potential of CFD in this field. This session demonstrates, with real industrial project examples, the applications of CFD in modeling wave and current interactions with offshore structures. The objective is to increase the industry's awareness and to advocate industrial wide efforts to develop, mature, and apply this advance technology.

Session Chairperson(s):

David Wisch, Chevron ETC

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|------|-------|---|
| 0930 | 25213 | Wet Deck Slamming Analysis of Twin-Hulled Offshore Ship in Irregular Sea Waves<br>L. Rahumathulla, V. Gupta, M. Agrawal, ANSYS Inc              |
| 0952 | 25233 | Fluid-Structure Interaction: Lowering Subsea Structure / Equipment in Splash Zone During Installation<br>D. Jia, Technip; M. Agrawal, ANSYS Inc |
| 1014 | 25385 | Practical Application of CFD Modeling of Air Gap and Wave Loads In Offshore Structure Design<br>G. Wu, D.G. Danmeier, Chevron                   |

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| 1036 | 25423 | CFD-FE Simulation of Wave Slamming on an Offshore Platform in Extreme Sea States<br>J.W. Kim, H. Jang, R. Izarra, Technip; D. Martin, Dassault Systems; O. Dalane, Statoil   |
| 1058 | 25432 | Fatigue Assessment of Arrayed Pull-Tubes in a Truss Spar via Coupled Computational Fluid-Structure Interaction<br>M. Tognarelli, BP America Production Company; H. Gupta, BP; S. Holmes, Red Wing Engineering; W. Calver, Altair |
| 1142 | 25429 | Fluid-Structure Interaction and Applications to Screening Pipeline Span VIV and Subsea Piping FIV<br>J.P. Pontaza, Shell International Exploration and Production Inc.   |

## **004 New Deepwater Construction Equipment - Update 2014**

### **312**

This technical session expands on the theme of a previous OTC 2012 session "New Deepwater Construction Equipment: A Vision for the Future," with some authors presenting updated information on the new construction assets which have since debuted in the deepwater construction arena, including sea trials/commissioning and first pipe lay experiences with the new vessels. Some significant new vessels and equipment which have entered or are expected to enter, the market in the near future are also being highlighted.

#### Session Chairperson(s):

Jayesh Antani, Enbridge Offshore Pipelines LLC

Rene Raaijmakers, IHC Merwede

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|------|-------|---|
| 0930 | 25110 | CastorOne and FDS 2: Getting Stronger for Laying Deeper<br>R. Faldini, A. Oldani, S. Marchini, Saipem Spa; R. Pellegrini, Saipem LTD  |
| 0952 | 25101 | Deepwater Construction Vessel 'Aegir' Shifting the Frontiers of Reeling<br>J. van der Graaf, K. van Zandwijk, Heerema marine Contractors Nederland S.E.   |
| 1014 | 25246 | New Deepwater Construction Equipment Update 2014<br>M. Wilson, Ecosse Subsea Systems Ltd  |
| 1036 | 25288 | Ultra Deepwater Reel and Flexible Pipelay Vessel for Pre-Salt Field Developments<br>E. Erik Christiani Ph.D. , M.Sc., EMAS AMC  |
| 1058 | 25331 | Practical and Theoretical Assessments of Subsea Installation Capacity for HYSY 201 Laybarge According to Recent Project Performances in South China Sea<br>F. Wang, Y. Luo, Y. Xie, COTEC Offshore Engineering Solutions; B. Li, J. Li, China Offshore Oil Engineering Co., Ltd |
| 1120 | 25268 | Construction Vessel Market and Capability Modeling<br>L. Taylor, McDermott, Inc.  |
| 1142 | 25120 | The Single-Lift Vessel Pieter Schelte": Honoring the Past Shaping the Future"   |

## **005 Field Development: Managing Economics and Risks**

**610**

As field development is becoming increasingly complex and expensive, front end planning and proper economic and risk assessments are paramount for an oil and gas project to succeed. This session brings an insight on this topic from operators, suppliers, and academia.

Session Chairperson(s):

Marcos Morais, Petrobras

Luiz Souza, Petrobras

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| 0930 | 25094 | Key Aspects of Deepwater Appraisal<br>D. Reid, Shell Upstream Americas; M. Dekker, Shell International Ltd.; T.V. Wilson, Shell Exploration & Production Co  |
| 0952 | 25135 | Deepwater Development Strategy<br>M. Dekker, D. Reid, Shell Upstream Americas  |
| 1014 | 25119 | Saudi Arabia's Manifa Giant Offshore Field Development: The Role of Technology<br>J.O. Arukhe, S. Hanbazah, A. Ahmari, S. Al Ghamdi, K. Yateem, Saudi Aramco; M. Bal, D. Ahmed, F. Baez, Schlumberger                  |
| 1036 | 25440 | Early Production Systems - When Do They Make Good Business Sense for Your Project?<br>E.M. Coopersmith, Decision Frameworks LP; L. Mendoza-Natividad, Decision Frameworks, L.P.; K. Burkholder, Decision Frameworks LP |
| 1058 | 25442 | A Comparison of Pre- and Post-2005 Sanctioned Gulf of Mexico Tension Leg, Semi-submersible, and Spar Floating Platforms<br>R. D'Souza, R. Aggarwal, S. Basu, Granherne, a KBR Company                                  |
| 1120 | 25122 | Innovative Solutions Make China's First Marginal Subsea tie Back oil Field Into Production<br>M. Jiayou, Y. Jianjun, Y. Qingdong, L. Yiyong, Y. Zuan, CNOOC Ltd., Shenzhen   |
| 1142 | 25274 | An Evaluation of Large Capacity Processing Units for Ultra Deep Water and High GOR Oil Fields<br>J. Ribeiro, C.C. Branco, C.E. Vaz, A.C. Pinto, Petrobras  |

## **006 Monitoring Techniques and Systems - Cradle to Cradle - A Vital Input to Reliability and Integrity Management Programs**

**606**

This session presents actual use of monitoring to assess reliability and manage the risk inherent to operation of subsea facilities.

Session Chairperson(s):

Jennifer Bell, Elements Offshore

- 0930 25403 Subsea Wellhead and Riser Fatigue Monitoring in a Strong Surface and Submerged Current Environment  
S. Mcneill, Stress Engineering Services, Inc.; P. Agarwal, D.J. Kluk, Stress Engineering Services Inc; K. Bhalla, Stress Engineering Services, Inc.; R.D. Young, Stress Engineering Services Inc; S. Burman, Shell Brazil E&P; S. Liapis, Shell Oil Co.; S. Jain, Shell E&P; V. Jhingran, Shell International Ltd.; S. Hodges, Shell; E. Denison, Consultant
- 0952 25188 Reliability Analysis of Lazy Wave Steel Catenary Riser (LWSCR) Using Real-Time Monitoring Data  
L. Zhang, C. Wu, L. Liu, M. McQueen, INTECSEA
- 1014 25368 A Post-Installed Subsea Monitoring System for Structural and Flow Assurance Evaluation  
D.V. Brower, A. Brower, Astro Technology Inc.; J. Hedengren, R. Asgharzadeh, Brigham Young University
- 1036 25199 Optimizing Response Strategies to Improve Subsea Equipment Availability  
J.A. Pearse, A. Botto, Wood Group Integrity Management
- 1058 25301 Underwater monitoring network: Using the deep-sea Drill MARUM-MeBo for installing Seafloor Sensor Systems for monitoring Seafloor Intervention Operations  
C. Waldmann, T. Freudenthal, A. Kopf, University of Bremen/MARUM
- 1120 25228 Marine Magnetic Surveying and Disturbance Field Monitoring by Autonomous Marine Vehicles  
B. Poedjono, Schlumberger; S. Pai, Liquid Robotics Oil and Gas; S. Maus, Magnetic Variation Services

## 007 Human Factors in Engineering

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This session will address how to account for human behavior when designing facilities and operational guidelines.

#### Session Chairperson(s):

Kevin McSweeney, ABS

William Cowardin, Alion Science & Technology

- 0930 25130 Human Factors Analysis and Classification System (HFACS): Investigatory Tool for Human Factors in Offshore Operational Safety  
D.M. Hollaway, J.D. Johnson, ABS Consulting, Inc.
- 0952 25167 Implementing Human Factors Engineering in Offshore Installation Design  
J. Pray, K.P. McSweeney, ABS; C.W. Parker, Atkins Oil & Gas Engineering
- 1014 25078 Reporting Practices for Close Call (Near Miss) Reporting Systems  
B. Craig, R. Papillon, J. Curry, W. Zhu, Lamar University
- 1036 25280 Human Factors in Hazard Analysis  
B.R. Poblete, C.W. Parker, S. Ranasinghe, M. Gandhi, Atkins

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| 1058 | 25344 | Art, Science, and Engineering of Managing Offshore Field Development Economics and Risks<br>G. Chaudhury, A. Whooley, Wood Group Kenny                    |
| 1120 | 25125 | Jack-St. Malo Marine Operator Training Simulator<br>C. Hudson, Chevron; A. Rastogi, Kongsberg Oil & Gas Technologies, Inc.; T. Bhaumik, GVA North America |

## Monday, 5 May 2014, 1400–1630

### 008 How will Unconventional Play Revolution Impact Offshore Deepwater Industry?

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The recent surge in unconventional oil and natural gas production in the United States (US) has been called a “Revolution”. Unlocking of massive unconventional reserves in the US is the biggest game changer in recent years. The US is now the number one unconventional oil and gas producer in the world. US together with Canada now accounts for more than twenty-five percent (25%) of global natural gas production. Shale gas will play an ever-increasing role in this resource base and per Energy Information Administration (EIA) is projected to increase to almost half of total US gas production by 2040. Per EIA, US tight oil production will continue to grow till 2020 and is projected to reach almost half of total US oil production. Influenced by the US success, the global unconventional play exploration activities have been active and also increased. This revolution has re-shaped and will continue to shape the energy resource picture for the entire world. For instance, in the US unconventional play investment has also led to resurgence of domestic manufacturing. Though onshore unconventional play development has very different development style (faster pace, cost sensitive, high number of well count, urban planning, etc.) from deepwater development (much higher cost and related risks, fewer wells, long project time, technology intensive, etc.), they have started and will continuously compete in talent recourses, investment flow, and technology supplies, etc. This panel will discuss supply projections and overlays it with market drivers to portray value proposition. It will compare and contrast unconventional plays and deepwater from a full life cycle of exploration to operations. It will discuss implication of regulations and policy. It then will summarize and identify areas of discussion and viewpoints from its panelists.

Session Chairperson(s):

Sandeep Khurana, Noble Energy Inc.

Y Doreen Chin, Shell Exploration & Production Co

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|------|---|
| 1400 | Speaker - James Slutz<br>J.A. Slutz, Global Energy Strategies LLC |
| 1400 | Speaker - Greg Guidry<br>G. Guidry, Shell                         |
| 1400 | Speaker - Lee Tillman<br>L.M. Tillman, Marathon Oil Co            |
| 1400 | Speaker - Torstein Hole<br>T. Hole, Statoil North America         |
| 1400 | Speaker - Darrell Hollek<br>D.E. Hollek, Anadarko Petroleum Corp  |

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| 1400 |       | Speaker - David Eyton<br>D.G. Eyton, BP plc  |
| 1400 |       | Moderator - Sandeep Khurana<br>S. Khurana, Noble Energy Inc.   |
| 1400 |       | Moderator - Doreen Chin<br>Y. Chin, Shell Exploration & Production Co  |
| 1400 | 25450 | Will Unconventional Play Revolution Impact Deepwater Development?<br>S. Khurana, Noble Energy Inc.; Y. Chin, Shell Exploration & Production Co |

## 009 Ultradeepwater Risers

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This session is devoted to the recent achievements in design and operation of ultradeepwater risers.

#### Session Chairperson(s):

Carlos Moreira, Genesis Oil & Gas Consultants

William Kavanagh, MCS Kenny

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| 1400 | 25349 | Design Validation of the Caesar-Tonga Steel Lazy-Wave Risers using Field Data<br>A. Das, E. Balch, Wood Group Kenny; S. Fowler, Anadarko Petroleum Corporation; F. Yiu, Anadarko Petroleum Corp; M. Beattie, Anadarko Petroleum Corporation   |
| 1422 | 25354 | Espirito Santo: Operational Feedback on the Use of Steel Rises on a Turret Moored FPSO<br>A. Newport, SBM Offshore; S. Haheim, Shell Brasil Petroleo Ltda; E. Martineau, SBM Offshore   |
| 1444 | 25089 | A Fresh Look at Pipeline and Riser Bundles: Combined Experience and Practice<br>B. Seguin, M. Goodlad, Subsea 7   |
| 1506 | 25217 | State-of-the-Art SCR Qualification Program for 24 inch x 40 mm Thick Clad Pipe with Upset Ends for the Browse Project<br>B. Mekha, Cuneiform Offshore Consulting LLC; B. Hawkey, Woodside Energy Limited; B.D. Chandler, INTECSEA; B. Fazackerley, Microalloying International, Inc.; D.M. Stevens, D.M. Stevens & Associates, Inc. |
| 1528 | 25335 | Dynamic Plastic Deformation of Deepwater Steel Catenary Risers Under Extreme Cyclic Compressive Loading<br>G. Hu, M. Campbell, C. Huang, 2H Offshore Inc.   |
| 1550 | 25147 | Pressure balanced Telescopic Riser Safety Joint<br>T. Carlsen, B. Tommermo, T. Lovland, FMC Technologies; G. Tandberg, FMC Kongsberg Subsea; H. Carlsen, Kongsberg Offshore; A.D. Muff, R. Orekåsa, J. Lerstang, A. Sundkvist, A. Sørensen, FMC Technologies  |
| 1612 | 25380 | API RP 2GEN - Establishing Consistency in Design Margins<br>D.J. Wisch, Chevron ETC; S. Verret, Energo  |

## 010 Scientific Drilling Challenges in the Integrated Ocean Drilling Program

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In the Integrated Ocean Drilling Program, the Japan Agency for Marine Earth Science and Technology (JAMSTEC) has been performing drilling off the coast of Japan directly into the geological plate boundary where earthquakes occur. This session discusses the technology that has been developed to meet challenges in JAMSTEC's scientific drilling as they operate in the harsh deepwater environment with unique drilling goals.

### Session Chairperson(s):

Puneet Agarwal, Stress Engineering Services

Glenn Macdonald, Stress Subsea, Inc.

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| 1400 | 25149 | Development of Turbine Driven Coring System for Hard Rock Sampling<br>E. Miyazaki, Y. Shinmoto, M. Kyo, Japan Agency for Marine-Earth Science and Technology; T. Suzuki, NLC CO., LTD.; M. Hayashi, Turbo Blade CO., LTD.; N. Sugitani, Imadest CO., LTD.  |
| 1422 | 25138 | Development of 4,000 m Class CFRP Drilling Riser<br>E. Miyazaki, M. Kyo, Japan Agency for Marine-Earth Science and Technology; H. Seki, H. Takasaki, M. Ishida, Mitsubishi Plastics, Inc.  |
| 1444 | 25140 | Fatigue Strength Investigation of Drill Pipe for Challenging Scientific Deep Drilling and Utilization of Drilling Data to Estimate Cumulative Fatigue<br>T. Inoue, M. Kyo, JAMSTEC; K. Sakura, Tenaris; T. Fukui, TenarisNKK Tubes   |
| 1506 | 25182 | Planning and Feedback for Deepwater Drilling Riser Operations in High Currents, Typhoons and Cold Front<br>T. Saruhashi, I. Sawada, M. Kyo, E. Miyazaki, Y. Yamazaki, T. Yokoyama, Japan Agency for Marine-Earth Science and Technology; K. Bhalla, Stress Engineering Services Inc; M.J. Stahl, A. Ganpatye, Y. Han, Stress Engineering Services Inc.; L. Gong, Stress Engineering Services Inc |
| 1528 | 25142 | Successful Hole Enlargement Operations Utilizing Reaming While Drilling Techniques and Combining LWD operations in a Deep Water Drilling Environment<br>K. Takase, I. Sawada, T. Saruhashi, Japan Agency for Marine-Earth Science and Technology; R.D. Hodkin, National Oilwell Varco  |
| 1550 | 25143 | Black Ore Cultivation Program in the Okinawa Trough<br>T. Saruhashi, M. Kyo, I. Sawada, T. Nozaki, T. Yokoyama, Japan Agency for Marine-Earth Science and Technology; A.C. Lim, K.K. Goi, S.G. Teo, C. Seneviratne, NuStar Technologies  |
| 1612 | 25183 | Development of High Temperature Telemetry Systems for Long Term Borehole Monitoring Systems in Riser Holes<br>Y. Namba, M. Kyo, Japan Agency for Marine-Earth Science and Technology   |



## 011 Remote Intervention and Well Capping

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This session covers subsea intervention to wells and, in particular, well capping as well as state of the art techniques to remotely access any target in the body of water.

Session Chairperson(s):

Jean-Francois Saint-Marcoux, Acergy

Michael Collins, Shell International E&P Co.

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| 1400 |       | Invited Presenter - Jennifer Bell<br>J.M. Bell, Elements Offshore   |
| 1422 | 25259 | Subsea Well Response Project enhances international well incident intervention capabilities<br>K. Lewis, A.A. Kaczmarski, R. Lowery, H.A. Stanga, K. Kallaway, Subsea Well Response Project |
| 1444 | 25275 | Deep Water Pipeline Repair in the Gulf of Mexico<br>A. Dayani, L. Brown, S. Lazenby, Subsea 7; J. Miller, OSI QCS   |
| 1506 | 25253 | Remote Hydrocarbon Sampling Skid<br>M. Fowkes, Subsea 7; H. Ferguson, K. Bryson, Subsea7  |
| 1528 | 25277 | Safe Blind Flange removal in live and congested areas<br>M. Low, Subsea7; J. Cameron, R. Farstad, Subsea 7; A. Ferreira, Subsea7  |
| 1550 | 25239 | Subsea Field Inspection of the Future<br>H. Ferguson, J. Jamieson, G. Gair, Subsea7   |
| 1612 | 25123 | New Technology Application for Fast Recovery of a Typhoon Damaged oil Field in South China Sea<br>M. Jiayou, L. Yiyong, Y. Zuan, CNOOC Ltd., Shenzhen                                       |

## 012 Challenging Well Completion Solutions

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This session offers solutions and lessons learned for a broad range of challenging well completion situations encountered in offshore applications including sand control, stimulation, hydraulic fracturing design, intelligent completion system reliability lessons learned, and zonal production inflow control.

Session Chairperson(s):

Russell Bayh, Halliburton

Earl Claiborne, Chevron Corporation

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| 1400 |       | Invited Presenter - Ricki Jannise<br>R.C. Jannise, Halliburton Energy Services Grp  |
| 1422 | 25166 | An Environmentally Friendly Method to Evaluate Gravel and Frac Packed Intervals Using a New Non-Radioactive Tracer Technology<br>R. Duenckel, CARBO Ceramics, Inc.; H. Smith, Harry D. Smith Consulting; X. Han, CARBO Ceramics |

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| 1444 | 25179 | Hydraulic Fracture Design for the Lower Tertiary Gulf of Mexico: Optimization Under Uncertainty<br>S.B. Podhoretz, P.P. Valko, Texas A&M University  |
| 1506 | 25391 | A Review of IC Installations: Lessons Learned from Electric-Hydraulic, Hydraulic and All-Electric Systems<br>P. Maciel, E.P. Motta, Baker Hughes do Brasil   |
| 1528 | 25106 | An Innovative Approach Of Revival For Damaged Wells In High Erosive Environment Using Ceramic Sand Screens<br>K. Gaurav, BG Group-GTC; A. Nadeem, S. Ivanova, BG Group; J. Wheeler, BG Group-BG Advance  |
| 1550 | 25104 | Successful Coiled Tubing based Selective Stimulation of a Remote well in challenging offshore environment - A Case Study<br>A.K. Singh, Cairn India Pty. Ltd.; S. Anand, Cairn India Limited; A.B. Nikam, A. Parasher, Cairn India Ltd.; S. Kale, Weatherford International; R. D Cousta, Schlumberger |
| 1612 | 25161 | Intelligent Casing-Intelligent Formation (ICIF) Design<br>H.L. Stalford, R.M. Ahmed, V.H. Soriano Arambulo, University of Oklahoma   |

### 013 Advanced Downhole Sensing

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The high cost of SS intervention makes in-well monitoring its greatest value. Even if interventions are possible it may not be at optimal well condition with the traditional technology. Real time in-well monitoring can be done at full well rates to operate well at maximum safe rates and enable higher recoveries. This session will discuss these theories.

Session Chairperson(s):

Michael Romer, Exxon Mobil Corporation

Mirvais Yousefi, Photonics Sensing Solutions

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| 1400 | 25085 | In-well Monitoring for Deepwater Wells- Operator's View<br>S. Patni, Shell; D.E. Dria, Myden Energy Consulting PLLC   |
| 1422 | 25111 | Evaluation Of A Composite Device With An Embedded Non-intrusive Water Cut Sensing Platform For Production Tubing And Well Completions<br>A. Parker, G. Edward, R. Ladwa, M FLOW Technologies  |
| 1444 | 25173 | DFA Connectivity Advisor: A New Workflow to Use Measured and Modeled Fluid Gradients for Analysis of Reservoir Connectivity<br>V.K. Mishra, J.A. Canas, S.S. Betancourt, H. Dumont, L. Chen, I. De Santo, T. Pfeiffer, V.V. Achourov, N. Hingoo, J.Y. Zuo, O.C. Mullins, Schlumberger |
| 1506 | 25195 | Integration Into the Sandface Tool System for Gravel and Frack-Pack Installations with a Fiber Optics Wet-Mate Connector System<br>B.K. Drakeley, F. Morrison, Weatherford International; T. Grigsby, S. Martinez, E. Perez, Halliburton  |

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| 1528 | 25153 | Highest Reliability Provides World Class Benchmark For Permanent Downhole Monitoring Installation And Data Delivery In Malaysia<br>O.B. Samuel, Petronas Carigali Sdn. Bhd.; M. Khalid, Petronas Carigali Sdn Bhd; I. Raw, P.K. Kaka Singh, Schlumberger WTA Malaysia S/B |
| 1550 | 25394 | Improving Well Integrity in Permanent Downhole Monitoring Systems<br>T. Engel, C. Baldwin, J. Grunbeck, J. Kiddy, Weatherford; K. Stokkeland, Weatherford International Inc.  |
| 1612 | 25245 | Sensing Methane Using a Tunable Diode Laser Spectroscopy Method<br>J. McFadden, RSL Fiber Systems LLC   |

## 014 New Geophysical Approaches for Geohazard Consideration

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This session will cover new geophysical technologies for geohazard assessment, addressing acquisition, special processing, broadband data, CSEM, and 4D.

#### Session Chairperson(s):

Eric Cauquil, Total

Maarten Vanneste, Norwegian Geotechnical Inst.

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| 1400 | 25096 | Applications Of Detailed Velocity Field Studies From High Resolution Seismic (HRS) Data.<br>I.A. Stennett, N.D. Wakefield, K.P. Games, Gardline Geosurvey Ltd   |
| 1422 | 25317 | Do The New Broadband Acquisition Techniques Allow Us To Improve Sub-surface Geohazard Detection?<br>C.J. Saint-andre, TOTAL SA; a. Compoin, Universite de Bretagne Occidentale; E.C. Cauquil, F.J. Pivot, Total |
| 1444 | 25285 | Seismic Processing Techniques for Geohazard Identification and Risk Reduction in a Frontier Exploration Area<br>C. Noll, H. Liu, A. Poole, C. Helfrich, C. Scherschel, BP America Inc                           |
| 1506 | 25095 | High Resolution Imaging Using Sea Surface Related Multiples<br>S. Lu, D. Whitmore, J. Kinhead, A. Valenciano, R.D. Martinez, PGS  |
| 1528 | 25241 | How New Seismic Acquisition And Processing Technology Is Delivering High-resolution Images<br>V. Vinje, A. Ratcliffe, H. Hoeber, CGG  |
| 1550 | 25264 | Mapping gas Hydrate Systems in the Gulf of Mexico Using Marine CSEM<br>K.A. Weitemeyer, University of Southampton; S. Constable, K.W. Key, Scripps Institution of Oceanography                                  |
| 1612 | 25225 | 4d (time Lapse) Seismic: An Emerging Tool For Underwater Monitoring ?<br>C. Hubans, TOTAL SA; E.C. Cauquil, Total; E. Brechet, Total SA   |

## Tuesday, 6 May 2014, 0930–1200

### 015 Global Energy Outlook: Shaping the Future!

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The recent global financial crisis has brought about a significant deterioration in near-term energy demand and a consequential reduction in supply which has possible longer-term implications. Secondly, climate change considerations and greater regulation of the energy mix are also on the horizon. The combination of these – one being a mega event and the other a mega trend – has already had significant near-term impact on the oil and gas sector and could also lead to a fundamental transformation in the long-term. Even with the projected reduction of carbon in the energy mix, it is expected that the level of energy demand in 2050 will be such that it will require similar levels of oil and gas production as today. Since oil and gas production declines naturally, sustaining it to 2050 effectively requires re-building the equivalent of today's oil and gas business over the next 40 years – and doing so from more technically challenging deposits. At the same time, the world increasingly desires lower carbon energy. Governments and industry are responding. A rapid transition to green energy will likely prompt the introduction of more green incentives and increased regulation of fossil fuels. This in turn could lead to an increase in the total cost of energy, since most renewable energy options are inherently more expensive to scale up than energy derived from fossil fuels. All of this raises key questions. What are the desirable energy mix and transition pathways which will provide the world with affordable, secure and increasingly lower-carbon energy?

Session Chairperson(s):

Gamal Hassan, ADH International

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| 0930 | Speaker - William Flores<br>W. Flores, U.S. House of Representatives |
| 0930 | Speaker - Gustavo Hernández-García<br>G. Hernández-García, Pemex     |
| 0930 | Speaker - Christopher Smith<br>C. Smith, U.S. Government             |
| 0930 | Moderator - Gamal Hassan<br>G.A. Hassan, ADH International           |

### 016 HP/HT Challenges

604

Finding and producing new HC reserves involves contending with increasingly harsh environments. Attractive new prospects such as deepwater high-pressure wells in the GoM and the growing use of thermal recovery techniques have dramatically increased the requirement for HPHT technology.

Session Chairperson(s):

Yu Li, Baker Hughes (Nederland) BV

Cornelia Noel, Shell

- 0930 25321 Ultra-High Strength Proppant Developed for Deep, Offshore Completions  
T.T. Palisch, R.J. Duenckel, CARBO Ceramics, Inc.; B.A. Wilson, CARBO Ceramics
- 0952 25121 A Drill Stem Well Testing Design for Extreme HP/HT Exploration Wells  
F. Milenkovic, N. Suryana Bt Nik Khansani, Petronas
- 1014 25207 Innovative Positioning of Downhole Pressure Gauges Close to Perforations in HPHT Slim Well during a Drillstem Test  
V. Kumar, Schlumberger; A. AlNahdi, H. Gill, Saudi Aramco; P. Karunakaran, I. Sid, W. Azem, Schlumberger
- 1036 25343 High-Pressure High-Temperature Fluids Modeling: One of the Crucial Keys to Ultra-Deep Gas Drilling  
A. Seddighin, Baker Hughes Ltd
- 1058 25352 Design Method and LRFD for HPHT Subsea Equipment for Extreme and Survival Load Conditions  
P.D. Pathak, S.L. Taylor, Onesubsea
- 1120 25100 New Kinetic Model to Characterize the Filter Cake Formation and Fluid Loss in HPHT Process  
C. Vipulanandan, University of Houston -CIGMAT; B. Basirat, University of Houston - CIGMAT; A. Raheem, CIGMAT- University of Houston; A. Mohammed, CIGMAT-University of Houston; D.A. Richardson, RPSEA
- 1142 25074 Innovative Kick Detection System for HP/HT Ultradeepwater Wells Using a Section of the BHA  
P.P. Trivedi, Pandit Deendayal Petroleum Universtiy

## 017 Flow Assurance Technologies - Advances and Applications

### 602

This session will cover newer technologies and different perspectives on the flow assurance applications on a broader spectrum, presented by authors from various subsea organizations and educational institutes.

#### Session Chairperson(s):

Phaneendra Kondapi, University of Houston

Barbara Thompson, Aker Solutions

- 0930 25294 On the Development of an Enhanced Method to Predict Asphaltene Precipitation  
F. Vargas, M. Garcia-Bermudes, M. Boggara, Rice University; S. Punnapala, Abu Dhabi Co. Onshore Oil Opn.; M.I. Abutaqiya, TAKREER; N.T. Mathew, S. Prasad, A. Khaleel, M.H. Al Rashed, H.Y. Al Asafen, The Petroleum Institute
- 0952 25439 New Hydrate Anti-agglomerant Formulation for Offshore Flow Assurance and Oil Capture  
M. Sun, Reservoir Engineering Research Institute; A. Firoozabadi, Reservoir Engr. Research Inst.

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|------|-------|--|
| 1014 | 25428 | Flow Assurance Issues Related to Flexible Riser and Pipeline System Configuration<br>L. Yu, S. Mohammad, S.A. Bufton, M. Li, INTECSEA  |
| 1036 | 25283 | Flow Assurance Indicators for the Design of Long Subsea Tiebacks<br>E. Zakarian, J. Morgan, Woodside Energy Ltd  |
| 1058 | 25162 | Need for Industry Ready Education: Flow Assurance Course - A Case Study<br>P.B. Kondapi, University of Houston   |
| 1120 | 25107 | Active Heating for Life of Field Flow Assurance<br>P. McDermott, Subsea7; R. Sathananthan, Subsea 7  |
| 1142 | 25382 | Pumping Hydrate Slurries in the Arctic: A Different Perspective<br>B. Abulnaga, B. Woods, Fluor Corporation; C.N. Prescott, Fluor Enterprises Inc;<br>A. Mantha, Fluor Corporation |

## 018 Materials for Extreme Environments

### 312

This session focuses on the science and technology of advanced materials; addressing the new materials related challenges associated with hardware employed in developing HPHT reservoirs.

#### Session Chairperson(s):

Indranil Roy, Schlumberger

Greg Kusinski, Chevron

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|------|-------|--|
| 0930 | 25304 | New Polymeric Materials Development for Extreme Environments<br>R.R. Callaway, Greene, Tweed & Company; K. Drake PhD, Greene Tweed & Co.                                     |
| 0952 | 25293 | Sealing Material Performance Gaps in Ultra-HP/HT Applications<br>J. Ren, D.P. Gerrard, Baker Hughes  |
| 1014 | 25177 | Hydrogen Embrittlement Susceptibility of Precipitation Strengthened Ni-base Superalloys<br>S.J. Kernion, J.H. Magee, T. Werley, P. Maxwell, Carpenter Technology Corporation |
| 1036 | 25295 | Modeling the Properties of H <sub>2</sub> S - CO <sub>2</sub> - Salt - Water Extreme Environments<br>R.D. Springer, P. Wang, A. Anderko, OLI Systems Inc.                    |
| 1058 | 25209 | Nanostructured Metallic Materials In Extreme Environment<br>X. Zhang, K. Yu, Y. Chen, Texas A&M University   |
| 1120 | 25091 | Characterization of Wellbore Cement Properties by Means of Maturity Rule and Population Growth Models<br>A. Nabih, R. Chalaturnyk, University of Alberta                     |

## 019 RPSEA UDW Research Efforts - Floaters & Risers

### 610

This session will discuss results and ongoing work on several Research Partnership to Secure Energy for America managed ultradeepwater projects in the floating drilling or productions systems and risers areas.

#### Session Chairperson(s):

James Pappas, RPSEA

Sandor Karpathy, Stress Subsea, Inc.

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|------|-------|--|
| 0930 | 25406 | Steel Catenary Riser Design for Cylindrical FPSO Application in Ultra-Deep GoM<br>J. Vidic-Perunovic, S. Guo, Doris-Inc.; L. Wang, Statoil; F. Hopen, Sevan Marine<br>ASA; W. Head, RPSEA  |
| 0952 | 25250 | Challenges and Solutions of an Ultra-deepwater Dry Tree System for Drilling and<br>Production in the Gulf of Mexico<br>J. Zeng, D. Smith, W. Wu, Kvaerner  |
| 1014 | 25427 | VIM Model Testing and VIM Induced Mooring Fatigue of a Dry Tree Paired-<br>Column Semisubmersible Platform<br>J. Zou, P. Poll, A. Antony, S. Das, R. Padmanabhan, V. Vinayan, A. Parambath,<br>Houston Offshore Engineering  |
| 1036 | 25297 | Assessment of Ultra Deepwater Riser Concepts for High-Motion Vessels<br>B.S. Royer, Stress Engineering Services, Inc.; T.L. Power, Stress Engineering<br>Services Inc; D.O. Ayewah, Stress Engineering Services, Inc.; W. Head, RPSEA                              |
| 1058 | 25393 | Flexible Fiber-Reinforced Pipe for 10,000-Foot Water Depths: Performance<br>Assessments and Future Challenges<br>V. Jha, N. Dodds, D. Finch, J. Latto, GE Oil & Gas; G. Karabelas, Ge Oil and Gas;<br>M. Vermilyea, P. Baehmann, T.A. Anderson, GE Global Research |
| 1120 | 25084 | Qualification of Flexible Fiber-Reinforced Pipe for Ultra-deepwater Applications -<br>Update on Phase 1 Engineering and Phase 2 Prototype Testing<br>M. Kalman, L. Yu, A. Salimi, J. Liu, R. Joshi, DeepFlex Inc.  |
| 1142 | 25136 | Effects of Fiber Rope - Seabed Contact on Subsequent Rope Integrity<br>R.R. Ayers, Stress Engineering Services; C. Del Vecchio, Stress Engineering<br>Services, Inc.; P.V. Devlin, Chevron Corporation; W. Head, RPSEA   |

## 020 Geoscience Projects

### 606

The direct application of geoscience technologies and analysis is directly attributable to the overall economic and technical success of offshore oil and gas E&P projects. This session will present case studies as well as developmental results in the application of these techniques from a variety of analyses and environments.

#### Session Chairperson(s):

Jim Kreamer, Weinman Geoscience

Aurora Castelan, Schlumberger

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|------|-------|---|
| 0930 | 25353 | Evolution of High-Pressure, Flexible-Capacity air Compressors to Convert Smaller Vessels for use in Marine Seismic Exploration Industry<br>D.N. Dorrان, Atlas Copco Rental                                |
| 0952 | 25203 | LWD Sonic Data Analysis and Applicability in South China Sea<br>J. Cai, CNOOC Ltd.- ZhanJiang; L. Zhen, Schlumberger S.A.; Y. Shim, Y. Jiang, Schlumberger  |
| 1014 | 25226 | Blended Source Ocean Bottom Seismic Data Acquisition<br>D. Hays, FairfieldNodal; D.J. Monk, Apache Corp.; C. Walker, FairfieldNodal   |
| 1036 | 25150 | The Importance of Recognizing Hydrodynamics for Understanding Reservoir Volumetrics, Field Development and Well Placement<br>S. Green, Ikon Science Canada; R. Swarbrick, S.A. O'Connor, Ikon Science Ltd |
| 1058 | 25180 | The Application of Noise Attenuation Method Based on Frequency and Amplitude in China's Bohai Bay<br>S. Dong, B. Fan, Z. Wang, C. Qu, China Oilfield Services Limited                                     |
| 1120 | 25363 | Continuous Monitoring of Sedimentary Mechanical Properties Using Passive Broadband Seismic Techniques<br>J.A. Collins, D. Lizarralde, N. Farr, Woods Hole Oceanographic Institution                       |

## **021 Marine Archaeology and Environmental Studies in the Offshore Oil and Gas Industry** **600**

Offshore archaeology like many other facets of the offshore energy exploration industry is in a constant state of flux. New projects, technologies, and discoveries continually change the processes archaeologists use to locate, explore, and analyze underwater sites, be they shallow water prehistoric sites or deep ocean shipwrecks. This session will feature papers from private, federal, and academic archaeologists associated with the offshore energy industry. The papers will cover ongoing projects, new technologies for archaeological site documentation and analysis, discoveries, environmental impacts, or other aspects of work related to offshore exploration archaeology in the energy industry.

Session Chairperson(s):

Daniel Warren, C & C Technologies, Inc.

Kimberly Faulk, Geoscience Earth & Marine Services, a Forum Energy Technologies Company

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|------|-------|--|
| 0930 | 25281 | Technological Issues Related to the Identification of Submerged Prehistoric Sites<br>M.E. Keith, A.M. Evans, Tesla Offshore, LLC |
| 0952 | 25118 | Lophelia II Shipwreck Component: End Game<br>D.J. Warren, R. Church, R. Westrick, C & C Technologies, Inc.                       |
| 1014 | 25327 | Deep-Water Shipwreck Site Distribution: The Equation of Site Formation<br>R. Church, C & C Technologies, Inc.                    |
| 1036 | 25251 | Offshore Collaborative Archaeology<br>K. Faulk, Geoscience Earth & Marine Services, A Forum Energy Technologies Company          |



- 1058    25347    Interpreting the Past By Exploring the Abyss: Archaeological investigations of an early nineteenth-century shipwreck in the Gulf of Mexico  
C.E. Horrell, Bureau of Safety and Environmental Enforcement; A.A. Borgens, Texas Historical Commission
- 1120    25289    The Changing Role and Perception of Archaeology in the Gulf of Mexico  
Exploration Industry  
D.J. Warren, C & C Technologies, Inc.

## **Tuesday, 6 May 2014, 1400–1630**

### **022 ACTIVE ARENA: Energy Security & Economic Prosperity: Oil Spill Prevention**

**306**

Safe, sustainable production of oil and natural gas offshore will continue to be a key factor in our country's energy security and economic prosperity. The Department of the Interior's Bureau of Safety and Environmental Enforcement (BSEE) works to promote safety, protect the environment, and conserve resources offshore through rigorous regulatory oversight and enforcement. The Department of Energy's (DOE) Office of Fossil Energy, Office of Oil and Natural Gas supports research and development to scientifically quantify and mitigate/address the risks of oil and gas exploration and production. On August 22, 2013, DOE and BSEE signed a Memorandum of Collaboration to coordinate the ongoing efforts of the two agencies for offshore research and technological improvement projects. Through this collaboration, BSEE and DOE will continue to work together to develop technology that ensures safe, sustainable offshore production of oil and natural gas. The agencies will present and discuss how their collaborative efforts support building safety through technological improvement.

Session Chairperson(s):

Gamal Hassan, ADH International

Speaker - Christopher Smith

C. Smith, Department of Energy

Speaker - Brian Salerno

B. Salerno, Bureau of Safety and Environmental Enforcement

0930

Moderator - Gamal Hassan

G.A. Hassan, ADH International

### **023 Mars B Development- Driving Toward Top-Quartile Delivery through Integration**

**604**

This session will present an overview of Shell's landmark Mars B Development in the Gulf of Mexico with an emphasis on the unique challenges of the project. The session will cover the approaches and solutions utilized by the operator in the areas of seismic technology, well design, TLP design and construction, and operations planning.

Session Chairperson(s):

David Barton, KBR

Thomas Miller, Chevron Corporation

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|------|-------|--|
| 1400 | 25446 | Olympus TLP - Challenges and Considerations of Designing a Deepwater Venture for a 45 Year Production Life<br>M.S. Lindsay, Shell International E&P Co.  |
| 1422 | 25434 | Mars B-Olympus TLP Tow-Out Marks First Use of Synthetic Rigging; Finds Operational and HSSE Benefits<br>P. Dixon, Shell International Exploration and Production   |
| 1444 | 25441 | Olympus TLP Operations Team - Enabling a community of excellence<br>J. Trussell, Shell; M. Chevis, Shell Exploration & Production Company  |
| 1506 | 25435 | Cutting Edge Seismic Technology Boosts Mars B Project by Delivering Exploration, Maturation and Development of Two Subsea Fields Tied Back to New Olympus TLP at a Top Quartile Pace<br>R. Sloan, Shell; K. King, Shell Exploration & Production Company   |
| 1528 | 25443 | 50 reservoirs, 48 well Slots & Two TLP's - Maximizing recovery from the Deepwater Prolific Mars Field<br>D. Newberry, Shell  |
| 1550 | 25436 | Olympus TLP - Design and Construction Embedded in a "I Care" Culture"<br>T. McGlothlin, Shell  |
| 1612 | 25437 | Mars-B Development; Well Challenges & Solutions - An Evolution of Traditional Well, Rig and Facility Design.<br>A.L. Van Den Haak, Shell International Exploration & Production Inc; W.J. Cameron, L.S. Grant, Shell Exploration & Production Co.; N.H. Japar, Shell Exploration & Production Co; D.R. Reagins, Shell Exploration & Production Co. |

## 024 Flow Assurance - Chemical Solutions for Sustainable Production

### 602

In this session, three technical papers on asphaltenes, two on hydrates, and two on wax/paraffin will be presented by operators, service companies, and university personnel. Both lab and field data will also be discussed in this session.

#### Session Chairperson(s):

Thomas Sifferman, ETP Consulting

Weihong Meng, Genesis Oil & Gas Consultants

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| 1400 | 25411 | Impact of Water Cut on Asphaltene Deposition Tendency<br>J. Wang, Chevron ETC; T. Fan, J.S. Buckley, New Mexico Inst-Mining & Tech; J.L. Creek, Chevron ETC                                      |
| 1422 | 25172 | Variation Of The Asphaltene Onset Pressure Due To Reservoir Fluid Disequilibrium<br>Y. Chen, K. Wang, L. Chen, H. Dumont, V.K. Mishra, J.Y. Zuo, O.C. Mullins, Schlumberger; H. Elshahawi, Shell |
| 1444 | 25113 | New Dead-Crude Oil Asphaltene Inhibitor Test Method<br>D.W. Jennings, R. Cable, G.C. Leonard, Baker Hughes   |

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| 1506 | 25309 | Hydrate Deposition Mechanisms on Pipe Walls<br>G.A. Grasso, Colorado School of Mines; J.L. Creek, Chevron ETC; C. Koh, E.D. Sloan, Colorado School of Mines; G. Kusinski, Chevron ETC, DeepStar; A.K. Sum, Colorado School of Mines     |
| 1528 | 25336 | Development and Implementation of a High Temperature and Salinity Tolerant Kinetic Hydrate Inhibitor to Replace an Existing, Ten-Year Continuous Application<br>P.A. Webber, N.L. Morales, A. Madden, Nalco Champion, An Ecolab Company |
| 1550 | 25097 | Wax Deposit Surface Characteristic under Single-phase and Water-in-Crude-Oil Flow Conditions<br>E. Panacharoensawad, C. Sarica, University of Tulsa   |
| 1612 | 25109 | Study the Effect of Condensate Tie-back on Wax Deposition in an Indonesian Offshore Crude Oil Pipeline<br>A. Singh, University of Tulsa; H. Lee, P. Singh, ConocoPhillips Co.; C. Sarica, University of Tulsa                           |

## **025 Evolution of Deepwater Technology**

### **312**

New frontier oil and gas discoveries are increasing in the deepwater domain. This technical session features six specialist papers, describing how deepwater technology has evolved and the current frontiers. The papers give a regional view, using actual examples on the technology constraints faced by deepwater development. These include water depth, subsea distance from host or coast, processing intensity and complexity, and manning levels and automation.

#### Session Chairperson(s):

Robert Ziegler, PETRONAS Carigali Sdn Bhd

Neil Kavanagh, Woodside Energy Ltd.

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| 1400 | 25165 | Impact on Risers and Flowlines of the FPSO Mooring in Deepwater and Ultra Deepwater<br>J. Saint-marcoux, Subsea 7; J. Legras, Subsea7 Joint Venture |
| 1422 | 25255 | MWCC's Expanded System: Enhancing Well Containment in the U.S. Gulf of Mexico<br>M. Massey, Marine Well Containment Company                         |

- 1444 25364 Risks and Impact Assessment for Deepwater and Ultra-Deepwater Gulf of Mexico Resources  
K. Rose, United States Department of Energy, National Energy Technology Laboratory; F. Aminzadeh, University of Southern California; L. Sim, United States Department of Energy, National Energy Technology Laboratory; R.G. Ghanem, University of Southern California; C. Disenhof, J. Bauer, United States Department of Energy, National Energy Technology Laboratory; M. Mark-Moser, Oak Ridge Institute for Science & Education Fellow, National Energy Technology Laboratory; C. Thimmisetty, N. Jabbari, A. Khodabakhshnejad, Viterbi School of Engineering University of Southern California
- 1506 25351 Novel Dry-Tree Semisubmersible Solutions for Deepwater Marginal Field Development  
A.M. Mansour, D. Kumar, R. Zuccolo, J. James, H. Heidari, INTECSEA, WorleyParsons Group
- 1528 25348 A Dry Tree Semisubmersible Floating Production Unit Alternative for Field Developments  
J. Korsnes, Moss Maritime a.s.; R. Noce, Moss Maritime Inc.
- 1550 25388 Low Motion Semisubmersible Hull for Dry Tree Application  
J. Kyoung, Technip; J.F. O'Sullivan, Technip USA, Inc.; K. Lambrakos, J.W. Kim, J. Ermon, Technip
- 1612 25248 Numerical Simulation of Liquid Sloshing in Floating LNG  
M. Agrawal, L. Rahumathulla, ANSYS Inc

## 026 Advances in Flexible Pipe Technology

### 610

This session includes papers from operators, manufacturers, and subject matter experts on expanding the pressure, temperature and water depth envelope, new qualification processes and methods, and integrity monitoring of unbonded flexible pipe.

#### Session Chairperson(s):

Adrian Connaire, MCS Kenny

Krassimir Doynov, Exxon Mobil Corporation

- 1400 25334 Offshore Application of a Novel Approach to the Inspection of Flexible Risers  
G. Eckold, K. Kershaw, D. Buttle, W. Binny, J. McCarthy, GE Oil & Gas; A. Griffiths, Shell
- 1422 25126 Qualification of Flexible Flowlines: Lateral Instability Testing  
R.L. Tanaka, R. Morini, C.A. Godinho, Prysmian Surfex; D. Swanek, C. Timms, C-FER Technologies
- 1444 25254 High Pressure Flexibles Pipes - Knowledge and Qualifications at 15kpsi, 17.5kpsi and 20kpsi Design Pressure.  
A. Felix-Henry, P. Secher, G. Bernard, P. Estrier, A. Deheeger, Flexi France

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|------|-------|---|
| 1506 | 25448 | Vortex Induced VIBRATION Model Test for Step Riser configuration<br>Y. Hou, J. Yuan, J. Zhang, Z. Tan, GE oil and gas, Wellstream   |
| 1528 | 25092 | Qualification of Unbonded Flexible Pipe to API and DNV Standards<br>M.D. Kalman, DeepFlex Inc; J. Suarez, Det Norske Veritas (USA) Inc.; L. Yu,<br>DeepFlex Inc; C. Durr, DeepFlex Inc. |
| 1550 | 25332 | Restricted-S Riser Configuration for Ultra-Shallow Water Projects<br>C.D. Christensen, National Oilwell Varco (NOV Flexibles)   |
| 1612 | 25236 | New Design Of Lightweight Flexible Pipe For Offshore Oil Offloading Transfer<br>A. Do, S. Legeay, Technip; J.P. Roques, A. Karnikian, Total S.A.; D. Charliac, J.<br>Pere, Technip      |

## 027 Geoscience Developments

### 606

The continuous development of multi-disciplined geophysical and geoscience techniques is vital for a successful E&P program as well as environmental initiatives in the offshore environment. This session will be a showcase of the development and application of a variety of these technologies ranging from 3D seismic and electromagnetic technologies to methods in analysis.

#### Session Chairperson(s):

Aurora Castelan, Schlumberger

Jim Kreamer, Weinman Geoscience

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|------|-------|--|
| 1400 | 25088 | Gis Analysis Of Pockmarks From 3D Seismic Exploration Surveys<br>J.B. Geldof, TOTAL; J. Gafeira, BGS; J. Contet, S. Marquet, TOTAL   |
| 1422 | 25240 | Developing a Mechanic Earth Model Using Tectonic Deformation Coefficients in<br>Ceuta VLG-3676 Field, Maracaibo Basin, Venezuela<br>V.J. Vasquez, PDVSA E&P; A. Pierre-Bois, Beicip Franlap  |
| 1444 | 25086 | HPHT Formation Evaluation : Planning For Success via a Structured Approach<br>J. Owens, Maersk Oil   |
| 1506 | 25269 | Integration of Horizontal Wells in the Modeling of Carbonates Reservoir.<br>Upscaling and Economical Assessment Challenges<br>T. Ait Ettajer, Repsol E&P USA Inc; L. Fontanelli, Repsol E&P U.S.A.; A. Diaz,<br>Repsol                                       |
| 1528 | 25158 | Using Generalized Linear Regression of Multiple Attributes for Modeling and<br>Prediction the Formation Permeability in Sandstone Reservoir<br>W.J. Al-Mudhafer, Louisiana State University (petr. Eng. Dept)  |
| 1550 | 25081 | Development and Possible Applications of Mebo200 for Geotechnical<br>Investigations for the Underwater Mining<br>G. Spagnoli, BAUER Maschinen GmbH; T. Freudenthal, Marum University of<br>Bremen; M. Strasser, ETH Zürich; L. Weixler, BAUER Maschinen GmbH |

## 028 RPSEA/DOE UDW Flow Assurance & Subsea Systems Projects

600

This session provides information regarding several Research Partnership to Secure Energy for America and National Energy Technology Laboratory/U.S. Department of Energy projects related to high pressure - high temperature equations of state, corrosion and inhibition testing, and mineral solubility effects. It will also discuss work on subsea measurement improvement and autonomous underwater vehicle laser inspection equipment.

Session Chairperson(s):

James Pappas,

Jayesh Antani, Enbridge Offshore Pipelines LLC

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|------|-------|---|
| 1400 | 25425 | Status of Equation of State Project at the NETL<br>I.K. Gamwo, U.S. DOE-NETL; W.A. Burgess, US DOE-NETL; D. Tapriyal, URS Corporation; H.O. Baled, University of Pittsburgh; B.D. Morreale, Y. Soong, U.S. DOE-NETL; R.M. Enick, University of Pittsburgh; B.A. Bamgbade, Y. Wu, VCU; M.A. McHugh, Virginia Commonwealth University |
| 1422 | 25193 | Corrosion Testing of Deepwater Tubing Materials under Extreme Pressure and Temperature Conditions<br>J. Huang, Brine Chemistry Solutions, LLC; P. Guraieb, Brine Chemistry Solutions; C. Yan, E. Contreras, Brine Chemistry Solutions, LLC; M.B. Tomson, Rice University; R. Tomson, Brine Chemistry Solutions                      |
| 1444 | 25216 | Solubility Study of Magnetite under Extreme High Pressure and High Temperature<br>P. Guraieb, Brine Chemistry Solutions, LLC; J. Huang, Brine Chemistry Solutions; C. Yan, E. Contreras, Brine Chemistry Solutions, LLC; M.B. Tomson, Rice University; R.C. Tomson, Brine Chemistry Solutions                                       |
| 1506 | 25307 | Hydrate Modeling & Flow Loop Experiments for Water Continuous & Partially Dispersed Systems<br>P. Vijayamohan, A.A. Majid, E.D. Sloan, A.K. Sum, Colorado School of Mines; E. Dellecase, M. Volk, University of Tulsa; C.A. Koh, Colorado School of Mines   |
| 1528 | 25381 | AUV-Based 3D Laser Inspection for Structural Integrity Management in Deepwater Fields<br>T. Reeves, Lockheed Martin Mission Systems & Training; D. Mcleod, Lockheed Martin; C. Embry, B. Nickerson, 3D at Depth, LLC; J. Jacobson, Lockheed Martin MST  |
| 1550 | 25395 | More Improvements to Deepwater Subsea Measurement<br>J. Shen, Chevron Energy Technology Company; W. Letton, Letton Hall Group; J.M. Pappas, RPSEA   |
| 1612 | 25325 | Deepstar 11901 - Subsea Low Salinity Injection Water for Increased Oil Recovery<br>S.J. Anres, Saipem; G. Skivington, Westgarth Ltd; K. Mateen, Total E&P USA, Inc.; T. Delaplace, Saipem; G. Kusinski, Chevron   |

## Wednesday, 7 May 2014, 0930–1200

### 029 Law of the Sea

#### 306

Over three-quarters of the maritime waters attributable to the 155 coastal states remain to be explored and/or exploited. Some 14% of these waters cover the deep and ultra-deep Extended Continental Shelf (ECS). The International Seabed Authority estimated in 2000 that the resource potential of offshore waters covered by the Exclusive Economic Zone and ECS waters amounted to USD 12,000 trillion. Thus, the potential is truly enormous. For some of these areas there are many challenges: some technical, some legal, some geodetic, and some environmental. A number of areas require peace to be restored. There are an estimated 311 maritime boundaries that remain to be agreed, with 209 agreed or in force. Where boundary disputes exist it is unlikely that hydrocarbon exploitation has occurred. Many areas in dispute are relatively easy to explore and exploit. This panel discussion will build on the background paper OTC-25306 written for OTC 2014 by the panelists. The panel format will include a brief presentation to convey additional meaning to the technical and legal basis of offshore boundaries. It will also provide additional information on the potential and challenges in selected areas and show how processes developed in the UNCLOS and via technology can help peacefully resolve many of these areas either in dispute or unallocated so that work may commence.

#### Session Chairperson(s):

Robert Van De Poll,

Buford Pollett, McDermott Middle East Inc

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| 0930 | Speaker - Pieter Bekker<br>P. Bekker, Steptoe & Johnson  |
| 0930 | Speaker - Niels Anderson<br>N. Anderson, Steptoe & Johnson LLP   |
| 0930 | Speaker - Toufic Nassif<br>T. Nassif, Sonde Resources Corp.  |
| 0930 | Speaker - David Bishopp<br>D. Bishopp, Galp Energia<br>Moderator - Robert van de Poll<br>R. van de Poll, Fugro N.V.<br>Moderator - Buford Pollett<br>B. Pollett, J. Ray McDermott Middle East Inc.   |
| 0930 | 25306 International Boundary Disputes: An unfinished tale of Geology, Technology, Money, Law, History, Politics and Diplomacy<br>R. Van De Poll, Fugro N.V.; D. Bishopp, Galp Energia; P. Bekker, Steptoe & Johnson LLP; N. Andersen, Vice-President at National Space Institute - DTU Space; S. Nordentoft-Lauridsen, Senior Consultant at National Space Institute - DTU Space; T. Nassif, Sonde Resources Corporation |

## **030 RPSEA UDW Research Efforts - Drilling, Interventions, and Weather-related Projects**

### **604**

This session highlights several Research Partnership to Secure Energy for America Ultradeepwater Program projects related to downhole visualization cementing assurance, well interventions, and weather-related predictions to assist in safely improving well construction performance.

Session Chairperson(s):

James Pappas,

Jason McClure, Chevron Products Co.

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|------|-------|---|
| 0930 | 25257 | A Gyroscope Guidance Sensor for Ultra-Deepwater Applications<br>D.A. Richardson, RPSEA  |
| 0952 | 25194 | Deepwater Reverse-Circulation Primary Cementing: Applicability and Technical Path Forward for Implementation<br>C. Wreden, J.T. Watters, CSI Technologies; R. Giroux, Weatherford; M. Nikolaou, K. Macfarlan, University of Houston; D.A. Richardson, RPSEA   |
| 1014 | 25099 | Development and Characterization of Smart Cement for Real Time Monitoring of Ultra Deepwater Oil Well Cementing Applications<br>C. Vipulanandan, University of Houston - CIGMAT; R. Krishnamoorti, University of Houston/UH-GEMI; Q. Qu, Baker Hughes; G.G. Narvaez, Baker Hughes RRTC; D.A. Richardson, J.M. Pappas, RPSEA; R. Saravanan, J. Liu, CIGMAT-University of Houston |
| 1036 | 25312 | Exploring Genesis Potential Indices<br>C. Bruyere, G. Holland, NCAR   |
| 1058 | 25302 | Future Changes in Gulf of Mexico Hurricane Wave Climatology<br>J. Done, C. Bruyere, NCAR; M. Ge, National Center for Atmospheric Research; G. Holland, NCAR   |
| 1120 | 25355 | Assessing Uncertainty and Predictability of Regional Climate, with a Focus on Hurricanes<br>G. Holland, J. Done, C. Bruyere, NCAR   |
| 1142 | 25200 | Behavior of Piezoresistive Smart Cement Contaminated with Oil Based Drilling Mud<br>C. Vipulanandan, M. Heidari, University of Houston - CIGMAT; H. Farzam, CEMEX; Q. Qu, Baker Hughes; H. Farzam, Cemex; J.M. Pappas, RPSEA  |

## **031 Subsea Processing**

### **602**

Advances in subsea processing technologies are presented covering boosting, separation, and compression. Results from verification, testing, and evaluation of these technologies are presented in this session by authors from industry and university.

Session Chairperson(s):

Phaneendra Kondapi, University of Houston

Luiz Souza, Petrobras



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| 0930 | 25187 | Permanent Magnet Motor-Driven Pump Systems for Subsea Boosting in the Arctic Fields<br>N.K. Ganatra, A. Strikovski, T. Hollingsaeter, FMC Technologies, Inc.   |
| 0952 | 25080 | Performance Evaluation of a Multiphase Electric Submersible Pump<br>G. Morrison, S. Pirouspanah, K. Kirkland, Texas A&M University; S.L. Scott, L.J. Barrios, Shell  |
| 1014 | 25215 | Paleogene Secondary Recovery Analysis<br>J. Hartley, E. Smedstad, E. Widjaja, FMC Technologies, Inc.; M. Nandakumar, FMC Technologies Inc  |
| 1036 | 25367 | Qualification of a Subsea Separator with On-line Desanding Capability for Shallow-water Applications<br>M.D. Olson, E. Grave, J. Juarez, ExxonMobil Upstream Research Company; M. Anderson, ExxonMobil Development Company           |
| 1058 | 25201 | Operability in Design - Fast, Flexible and Economical Design Tool For Subsea Gas Compression Design and Verification<br>M. Storvik, FMC Technologies; T.B. Irmann-Jacobsen, FMC Kongsberg Subsea AS; A. Bakken, FMC Technologies Inc |
| 1120 | 25299 | Subsea Compact Separation: Control System Design<br>Z. Li, M.D. Olson, V. Rayachoti, P. Gupte, F. Pierre, Jr., K. Gul, ExxonMobil Upstream Research Company  |
| 1142 | 25373 | Performance Testing of an In-Line ElectroCoalescer Device with Medium and Heavy Crudes<br>E.J. Grave, M.D. Olson, ExxonMobil Upstream Research Co.; A.E. Menchaca, R.W. Westra, M.R. Akdim, FMC Technologies Inc                     |

## **032 Lateral Buckling and Walking and Pipe Soil Interaction**

### **312**

This session is about pipe soil interaction and, more specifically, recent developments and lessons learned on lateral buckling and walking.

#### Session Chairperson(s):

David Bruton, Crondall Energy Consultants Ltd

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|------|-------|---|
| 0930 | 25389 | Lateral Buckling of Pipelines in Deepwater GoM<br>A. Hoor, BP Exploration & Production; R.D. Watson, N. Simpson, N. Krishnappa, Atkins; S. Singh, F. Baxter, A.S. Jesudasan, W. Zeng, BP Exploration & Production |
| 0952 | 25396 | BP Angola PSVM Project: Production Flowline Lateral Buckling Design<br>P.A. Cooper, INTECSEA; M. Crawford, BP; M. Bell, HMC   |
| 1014 | 25339 | Advances in Predicting Pipeline Embedment Based on Assessment of Field Data<br>D.A. Bruton, Crondall Energy   |

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| 1036 | 25117 | Lessons Learned - Counter-acts Used To Install Pipelines Offshore In Very Soft Clay<br>C. Olsen, Subsea 7; A. Rosborg, C.S. Sørensen, COWI; N. Brown, Subsea 7  |
| 1058 | 25287 | Sediment Mobility Effects on Seabed Resistance for Unburied Pipelines<br>F. Bransby, Advanced Geomechanics; A. Borges Rodriguez, Advanced Geomechanics; H. Zhou, J. Tom, H. Low, Advanced Geomechanics; D. White, University of Western Australia |
| 1120 | 25398 | Seabed Friction On Carbonate Soils: Physical Modelling of Axial Pipe-Soil Friction<br>N.P. Boylan, Advanced Geomechanics; D. White, University of Western Australia; P. Brunning, Subsea 7  |

### 033 Mooring System Design and Remediation Challenges

#### 610

Floating production systems are increasing in size, water depth, and length of service. These increases offer challenges to the design, fabrication, installation, and maintenance of mooring systems. This session will cover mooring systems from early concept development and design through to condition assessment monitoring. The results of condition assessments have led operators to choose to remediate degraded mooring systems on some floaters and several examples of mooring replacement will be presented.

#### Session Chairperson(s):

Roald Lokken, ExxonMobil Upstream Research Co. (SO)

Shiladitya Basu, KBR

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| 0930 | 25232 | Lifetime Extension North Sea FPSO, Mooring System Replacement; Integrity and Design Challenges<br>R. Leeuwenburgh, Bluewater Energy Services BV; H.T. Brinkhuis, Bluewater Energy Services B.V.   |
| 0952 | 25449 | Serpentina FPSO Mooring Integrity Issues and System Replacement: Unique Fast Track Approach<br>S. Bhattacharjee, ExxonMobil Production Co.; S.M. Majhi, Granherne - KBR; D. Smith, Exxon Mobil Corporation; R. Garrity, DelMar Operating Inc. |
| 1014 | 25418 | Operating Performance Forecasting and Evaluation of an FPSO with Degrading Mooring System Components<br>C. Carra, S. Wales, J. Gumley, AMOG Consulting; B. Jobson, S. McDonnell, U. Mir, OMV New Zealand Ltd                                  |
| 1036 | 25108 | Pre-FEED decision making for mooring system configuration using Progressive Reliability Method<br>M. Mousavi, K. Haverty, Aker Solutions  |
| 1058 | 25322 | Gryphon Alpha FPSO - Experience Gained During Moorings Replacement and Hook-Up<br>F. Toal, J. Martin, Maersk Oil North Sea UK Limited; M. Brown, I. Lindsay, R. Sinclair, GL Noble Denton   |

### 034 Invited Organization (JOGMEC)

606

Japan Oil, Gas and Metals National Corporation (JOGMEC), under Ministry of Economy, Trade and Industry of Japan (METI) carried out an offshore gas production test from methane hydrate at the Nankai Trough, offshore Japan, Northwest Pacific, in early 2013. This session focuses on the results of the production test. General and offshore activities of JOGMEC as a Japanese governmental body for developing hydrocarbon and mineral resources, and the history of Japanese efforts in research on methane hydrate as a possible future energy resource will also be introduced.

#### Session Chairperson(s):

Koji Yamamoto, Japan Oil Gas & Metals Natl Corp

Ray Boswell, U.S. Dept. of Energy

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|------|-------|---|
| 0930 |       | Invited Presenter - Dr. Yoshihiro Tsuji<br>Y. Tsuji, JOGMEC   |
| 0952 | 25451 | Road to Offshore Gas Production Test - From Malik to Nankai Trough<br>T. Saeki, JOGMEC  |
| 1014 | 25243 | Operational overview of the first offshore production test of methane hydrates in the Eastern Nankai Trough<br>K. Yamamoto, Japan Oil, Gas & Metals Natl. Corp.; Y. Terao, T. Fujii, Japan Oil, Gas and Metals National Corporation; I. Terumichi, Japan Petroleum Exploration Co.Ltd.; M. Seki, Japan Petr. Explor. Co. Ltd.; M. Matsuzawa, Japan Drilling Co. Ltd.; T. Kanno, Schlumberger KK |
| 1036 | 25310 | A Completion System Application For the World's First Marine Hydrate Production Test<br>W.J. Hay, Baker Hughes Inc; M. Matsuzawa, Japan Drilling Co. Ltd.; T. Yoshihiro, Japan Oil, Gas and Metals National Corporation; M.W. Duncan, Baker Hughes Inc; L. Wingstrom, Baker Hughes Solutions; I. Ayling, Baker Hughes Inc   |
| 1058 | 25235 | In-situ Temperature Measurement of Gas Hydrate Dissociation during the World-First Offshore Production Test<br>T. Kanno, M. Takekoshi, X. Wang, S.S. Chee, M. Fukuhara, O. Osawa, Schlumberger; K. Yamamoto, T. Fujii, T. Takayama, K. Suzuki, Japan Oil, Gas and Metals National Corporation   |
| 1120 | 25330 | Deepwater Methane Hydrate Gravel Packing Completion Results and Challenges<br>W.J. Hay, M.W. Duncan, L. Dang, Baker Hughes Inc; T. Yoshihiro, Japan Oil, Gas and Metals National Corporation  |

## 035 Offshore Decommissioning and Abandonment

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Demand for abandonment of wells and decommissioning of offshore platforms and other subsea facilities has skyrocketed in the past few years with depletion of older oil fields and hurricane damaged areas. Decommissioning costs are a significant liability for the operator and governments. Estimated costs have risen dramatically over the last five years as the industry begins to understand the issues, many of which are attributable to decisions made during the initial engineering and construction of an offshore development.

### Session Chairperson(s):

Hanaey Mustafa, Petroleum Development Oman

Marie Teixeira, Shell Brazil E&P

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| 0930 |       | Invited Presenter - Jon Khachaturian<br>J. Khachaturian, Versabar, Inc.   |
| 1014 | 25316 | Plug and Abandonment Using Reverse Cement Placement Technique in Deepwater Gulf of Mexico<br>E. Gubanov, D. Nana, M. Bogaerts, F. Moretti, N.C. Flamant, A. Kanahuati, Schlumberger                     |
| 1036 | 25247 | Decommissioning Costs Can Be Reduced<br>A.W. Stokes, Worley Parsons Europe Ltd  |
| 1058 | 25405 | Analytical Development of Seastate Limits Associated to the Abandonment Operations of a Structurally Compromised Subsea Well<br>T.N. Turner, N. Murdoch, Atkins   |
| 1120 | 25214 | Riserless Plug and Abandonment of Pilot Holes in Ultradeepwater<br>J. Vølstad, S.C. Hilliard, Statoil ASA; P.C. Aguilar, A.G. Salehpour, Schlumberger; M. Bogaerts, Schlumberger Technical Services Inc |
| 1142 | 25438 | Improving Overhead And Reducing Time Consumption on P&A Operations with E-line, Explosion-free, Mechanical Cutter Tool<br>C. Kruger, Welltec Inc; A. Faraoun, Welltec A/S; T. Eikeland, Welltec Norway  |

## Wednesday, 7 May 2014, 1400–1630

### 036 Funding New E&P Technologies

306

At the end of the day, new technology is only valuable if it can be successfully deployed, and this of course requires operator up-take or “pull.” While established service and manufacturing companies supply the bulk of new E&P technology, a number of different organizations provide alternative funding mechanisms. This panel session will examine six existing organizations. The presentations and following moderated discussion will cover:

- Present current funding solicitation and evaluation process
- Future technology needs expect to fund over the next 3 years, with funding levels.
- How these have changed from the past
- The good, bad, and ugly of past solicitations—what do prospective awardees need to do well in the solicitation process to be in the best position to secure funding.
- Lessons learned from previously funded and executed R&D projects—with examples of projects or seed funding that resulted in commercial success and failure.

Session Chairperson(s):

Art Schroeder, Energy Valley Inc.

1400		Moderator - Art Schroeder A.J. Schroeder, Energy Valley Inc.
1400		Moderator - Brad Burke B. Burke, Rice University
1400		Speaker - Greg Kusinski G. Kusinski, Chevron
1400		Speaker - Paddy O'Brien P. O'Brien, ITF Energy Partners LLC
1400		Speaker - James Pappas J. Pappas, RPSEA
1400		Speaker - Jim Sledzik J. Sledzik, Energy Ventures Inc.
1400		Speaker - Richard Erskine R.G. Erskine, Statoil ASA
1400		Speaker - Glenn Janes G. Janes, RDC (Canada)
1400	25453	Funding New E&P Technologies A.J. Schroeder, Energy Valley Inc.

## **037 20 K Subsea Equipment – Industry Needs Development Challenges**

**604**

Oil and gas operations in deepwater environments have been increasingly facing high-pressure and eventually high-temperature conditions, which impact all aspects of the drilling and production process. This reality has brought to the industry one of the biggest technological challenges of the last decades. This session will show combined efforts from operators and equipment/service companies alike to develop materials, equipment, and standards to face the challenges of developing oil and gas resources under these extreme conditions.

Session Chairperson(s):

Jose Cunha, Ecopetrol America Inc

Alvaro Negrao, Woodside Energy Ltd.

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| 1400 | 25270 | Optimized Riser Architectures for 20 ksi Drilling Operations<br>N. Saeedi, E.L. Persent, D.C. Averbuch, J.M. Guesnon, IFP Energies nouvelles   |
| 1422 | 25190 | Wellhead Pressure Interlock Protection<br>R. Carlson, SOR Inc.; L. Wright, Chevron North America Exploration and Production Company  |
| 1444 | 25163 | Subsea Wellhead System Verification Analysis and Validation Testing<br>J.T. Kaculi, B.J. Witwer, Dril-Quip, Inc.   |
| 1506 | 25410 | API 11D1/ISO 14310 Grade V0 Qualified Ultra-HPHT Permanent Production Packer<br>J. Doane, Baker Hughes Incorporated; G. Deng, S.D. Collins, Baker Hughes Inc; R. Taylor, G. Anderson, T. Ansohn, Baker Hughes Incorporated |
| 1528 | 25212 | Improved Temperature Performance PolyArylEtherKetone Polymers for use in HPHT Conditions<br>P. Clemensen, Victrex USA; A. Chaplin, Victrex plc; K. Warmington, C. Duckworth, Victrex Polymer Solutions                     |
| 1550 | 25392 | Efficient Drilling of Ultra-HPHT Wells in the Gulf of Thailand<br>J. Araujo, Schlumberger; K. Kaotun, PTT Explor and Prod PLC; P. Dumrongthai, A. A, Schlumberger  |

## **038 Metrocean - New Developments and Perspectives**

**602**

Metrocean Design Criteria impacts every aspect of the design and operation of offshore facilities. This session captures the latest research and datasets that will quickly impact environmental forecasts.

Session Chairperson(s):

Gene Berek, Exxon Mobil Corporation

Valerie Quiniou Ramus, Total S.A.

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| 1400 | 25244 | Analysis of Hurricane Winds<br>P. Vickery, Applied Research Associates |
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| 1422 | 25357 | Squall Characterization in the Gulf of Mexico<br>G. Jeans, Oceanalysis Ltd; C. Cooper, Chevron Energy Technology Company; C. Yetsko, ConocoPhillips; G. Bryan, National Center for Atmospheric Research  |
| 1444 | 25249 | Squall Wind Elevation/Gust Factors and Squall Coherence<br>M. Santala, Chevron Energy Technology Company; M. Calverley, Fugro GEOS; S. Taws, Fugro GOES Ltd.; H. Grant, Fugro GEOS Ltd.; A. Watson, MetOceanWorks Ltd.; G. Jeans, Oceanalysis Ltd  |
| 1506 | 25369 | A Database of Oil Industry Deepwater Current Measurements<br>B. Magnell, L. Ivanov, D. Szabo, J.B. Andrews, A.T. Morrison, Woods Hole Group  |
| 1528 | 25421 | Signatures of Mid-Water 'Jets' in the Gulf Of Mexico BOEM NTL Dataset<br>B. Magnell, L. Ivanov, Woods Hole Group   |
| 1550 | 25204 | An Integrated Approach for Numerical Simulation of Earthquake Generated Tsunamis: Modeling Tsunami Generation, Propagation, Inundation and Fragility Analysis of Coastal Structures<br>D. Basu, Southwest Research Institute; R. Sewell, R.T. Sewell Associates; K. Das, R. Janetzke, B. Dasgupta, J. Stamatakos, D. Waiting, Southwest Research Institute |

### 039 API Subsea Standards for Deepwater

#### 312

The use of subsea production system technologies to produce hydrocarbons from deepwater environments worldwide continues to grow dramatically. Accordingly, industry's ability to do so using standardized equipment designs and procedures can enhance the ability to perform this function in a safe, cost-effective, and reliable manner. API Subcommittee 17 "Subsea Production Equipment" (SC17) has maintained an evergreen effort to develop and maintain a suite of standards relating to subsea production since the early 70s. This API SC17 session will provide an overview of the suite of documents that reside within the SC17 portfolio of standards, with special emphasis on those documents that are evolving and/or being developed to meet the industry's advancing technology needs.

#### Session Chairperson(s):

Thomas Kelly, FMC Technologies Inc

Eric Smith, Tulane University

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| 1400 | 25387 | API Subcommittee 17 Subsea Production Equipment" - Development of Industry Standards for Subsea Systems"<br>J. Bednar, BP  |
| 1422 | 25402 | API 17G Specification for Subsea Well Intervention Equipment<br>R. Stawaisz, Chevron Corporation; D.A. Muff, FMC Technologies; H.B. Skeels, FMC Technologies Inc |
| 1444 | 25415 | API RP17W Subsea Capping Stacks<br>D. Sadenwater, Chevron  |

1506	25366	Safety Systems for Subsea Applications E.L. Baniak, API; C.J. Curran, BP
1528	25376	API 17TR8 - HPHT Design Guideline for Subsea Equipment H.B. Skeels, FMC Technologies Inc
1550	25416	API 17TR12 - Consideration of External Pressure in the Design of Deepwater Subsea Equipment M.R. Williams, FMC Technologies Inc; M. Pham, BP America Production Co.
1612	25412	API 17N - Recommended Practise for Subsea Production System Reliability, Technical Risk and Integrity Management J.E. Strutt, Astrimar Consultants LLC; D.D. Wells, Hess Corp.

## 040 FLNG

### 610

The background for this session is that a number of offshore FLNG projects are currently planned world-wide. These FLNG projects involve the development of challenging new technology and systems to obtain reliable and safe operation. This session will address how the industry has developed some of the key FLNG technology and systems over the past 10-years. The session will start with a presentation by Noble Energy of the LNG evolution from Mini to Mega LNG: An Independent's Perspective. This will be followed by a presentation by Pangea LNG B.V. The Past and Future of LNG. Technip will address Challenges in a Multi-Disciplinary Approach for Explosion Design of FLNG, followed by a paper from TOTAL addressing How Waves Can Significantly Impact Performance of Amine Unit Installed on A FLNG. Development of a safe and reliable Tandem Offloading System has been seen as the “missing link” for offshore FLNG projects for many years. The last three presentations will address this key subject. Marin will present their view on Tandem versus Side to Side Offloading, based on experience from a number of model tests and simulations carried out during the past 10 years. This will be followed by a presentation from Saipem/Trelleborg summarizing the development and qualification process for a Tandem Offloading System using a floating cryogenic hose. OneSubsea will conclude the session with a presentation of the work carried out during several JIP projects over the past 10 years to develop a Tandem Offloading System using an aerial hose.

#### Session Chairperson(s):

Svein Hellesmark, 7 Seas Oil & Gas Group LLC

John Buckles, Chevron ETC

1400	25127	Mini to Mega LNG: An Independent's Perspective S. Khurana, S. Gallon, Noble Energy
1422	25131	The Past and Future of Floating LNG K. Eisbrenner, V. Srinivasan, S. Davison, R. van Vliet, R. Eisbrenner, A. Puga, NextDecade, LLC
1444	25230	Challenges in a Multi-Disciplinary Approach for Explosion Design of FLNG L. Paris, M. Cahay, Technip



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| 1506 | 25191 | How Waves Can Significantly Impact Performance of Amine Unit Installed on a FLNG ?<br>C. Weiss, E. Huguet, Total Exploration & Production; J. Magné-Drisc, P. Alix, IFP Energies nouvelles; G. Perdu, C. Salais, Prosernat; G. White, Heriot-Watt University |
| 1528 | 25383 | Integrating Hydrodynamic and Nautical Studies for Offshore LNG Operations<br>A.J. Voogt, J. Dekker, J. deWilde, MARIN  |
| 1550 | 25342 | Development of an LNG Tandem Offloading System Using Floating Cryogenic Hoses - Breaking the Boundaries of LNG Transfer in Open Seas<br>F. Benoit, B. Mauriès, F. Lirola, Saipem; V. Lagarrigue, Trelleborg  |
| 1612 | 25238 | Offshore Tandem Loading of LNG - from Idea to System Approval<br>J. Eide, OneSubsea Processing; R. Haakonsen, Kongsberg Oil & Gas; T.V. Oya, Aker Solutions; C. Frohne, Nexans   |

## **041 Petrotechnical Data Donation to Universities - Symposium on Results**

### **606**

Petrotechnical Data Donation to Universities contains presentations highlighting the mutual benefits to universities and operating companies as a result of the donation of petrotechnical data to universities for teaching and research purposes. Authors from operating companies, academia, and industry contractors will present topics covering geoscience and engineering interest areas, with a focus on shallow hazards and seabed considerations for exploration and development projects. The presentations feature case studies from various basins globally in which donated data have played a key role in university research projects for thesis and dissertation work, or used as classroom training material. Common themes for the session presentations include incorporating high-resolution data into the university research workflow, examples of scientific insights from research projects enabled by the donated datasets, benefits enjoyed by the operating companies who choose to make data donations, and training of a cadre of university graduates in the manipulation and interpretation of high-quality datasets in preparation for advancing their academic career or for entering the ocean development industry.

#### Session Chairperson(s):

James Thomson, BP plc

Dan McConnell, Fugro GeoConsulting Ltd

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| 1400 |       | Invited Presenter - Lesli Wood<br>L. Wood, Bureau of Economic Geology  |
| 1422 | 25098 | University and Corporate collaborations: Great Data, Good Science and a Strong Geoscience Workforce for the Future<br>L. Wood, Bureau of Economic Geology  |
| 1444 | 25168 | Inferred Depositional History of Middle-Late Quaternary Depositional Systems using Seismic Facies Analysis and Age Dating<br>O.A. Oyedele, Geoscience Earth & Marine Svc; W.R. Dupre', Department of Earth and Atmospheric Sciences, University of Houston |

- 1506 25210 Investigating Modern Ultra Deepwater Sedimentary Processes in the Central Gulf of Mexico Using High Resolution Geophysical Data  
M.I. Prieto, The University of Texas at Austin; L. Moscardelli, Statoil; L. Wood, Bureau of Economic Geology
- 1528 25198 Geohazards And Fluid Seepage Assessment On The Mad Dog Field Using Bathymetry, Ultra-high-resolution Seismic And Satellite Seepage Slick Data  
N. Cope, M. Huuse, University of Manchester
- 1550 25189 How to Execute a Successful Petrotechnical Data Donation Project  
J.A. Thomson, BP plc; B. Thorn, J. Tucker, BP America
- 1612 25337 Failure Mechanism of Cutting Submerged Frozen Clay in an Arctic Trenching Process  
D. Liefferink, IHC Merwede & Delft University of Technology; M. Alvarez Grima, IHC Merwede; S. Miedema, Delft University of Technology; R. Plat, IHC Merwede; C. van Rhee, Delft University of Technology

## 042 Methane Hydrate Case Studies

### 600

This session will look at the development and testing of hydrate resources. Hydrates have been tested in the Arctic, the Gulf of Mexico, Offshore Korea, Japan, and India as well as other areas in the last couple of years.

Session Chairperson(s):

Seung-Ho Kim, Korean Institute of Geoscience and Mineral Resources

Hieu Tran, Jacobs Engineering Group Inc.

- 1400 25384 System Response During Short- and Long-Term Gas Production from a Gas Hydrate Deposit at the Site of a Planned Field Test in the Ulleung Basin of the Korean East Sea  
G.J. Moridis, J. Kim, M.T. Reagan, Lawrence Berkeley Laboratory; S. Kim, Korea Inst of Geosci & Min Res
- 1422 25399 Core scale Evaluation Of Geomechanical Property Related To Gas Production From Gas Hydrate Deposits In The Ulleng Basin, East Sea, Korea  
J. Lee, KIGAM; J. Lee, S. Kim, Korea Inst of Geosci & Min Res; T. Ahn, KIGAM
- 1444 25308 Settlement Prediction In The Ulleung Basin Due To Gas Hydrate Production  
A. Kim, G. Cho, Korea Advanced Institute of Science and Technology; K. Song, Inha University; S. Kim, Korea Institute of Geoscience and Mineral Resources
- 1506 25137 Gas Hydrate Deposits of Krishna Godavari Basin, India: Issues and Potentiality in Exploration and Commercial Production  
V.K. Sahay, MEPL; A. Johnson, Hydrate Energy International
- 1528 25374 Guest Molecule Exchange Kinetics for the 2012 Ignik Sikumi Gas Hydrate Field Trial  
M. White, Pacific Northwest National Laboratory; W. Lee, Korea Institute of Geoscience and Mineral Resources

- 1550 25305 A Pressure Coring Operation and On-board Analyses of Methane Hydrate-bearing Samples  
K. Yamamoto, Japan Oil, Gas & Metals Natl. Corp.; T. Fujii, K. Suzuki, S. Kubo, Japan Oil, Gas and Metals National Corporation; N. Inada, Japan Oil Gas & Metals Natl Corp; Y. Nakatsuka, Japan Oil, Gas & Metals Natl. Corp.; Y. Konno, J. Yoneda, National Institute of Advanced Industrial Science and Technology; Y. Mizuguchi, Japan Agency for Marine-Earth Science and Technology
- 1612 25326 Numerical Simulation on the Impact of Temperature Behavior for Cement Hydration for the World's First Offshore Methane Hydrate Production Test  
X. Wang, M. Takekoshi, T. Kanno, V. Shako, V. Pimenov, A. Parshin, Schlumberger; K. Yamamoto, Japan Oil, Gas and Metals National Corporation

## Thursday, 8 May 2014, 0930–1200

### 043 Is Dual Gradient Ready for Prime Time?

306

Dual gradient drilling has long been recognized as the panacea for many, if not most of the challenges encountered when drilling wells in deep water. Consequently, the industry had embarked on several major JIPs, some of them leading to field trials, of various systems all designed to follow the natural pressure regime in the water column and in the formation below more closely. Due to technology maturity issues and cost, these JIPs remained without commercial projects following suite. However, recently, the technology has received renewed interest as deepwater exploration moves more into areas not accessible with conventional drilling and rig technology. We now have several operators that invest significant resources to have field-ready dual gradient drilling systems in their portfolio. This panel will unite the major current players, a mix of operators, drilling contractors and a service provider, as well as a representative from academia to analyze if it is the breakthrough in deepwater drilling, or just a niche technology for special applications like depleted reservoirs and sub-salt.

#### Session Chairperson(s):

Robert Ziegler, PETRONAS Carigali Sdn Bhd

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| 0930 | Speaker - Roger Stave<br>R. Stave, AGR Services A/S                   |
| 0930 | Speaker - Ken Smith<br>K.L. Smith, Chevron Corporation                |
| 0930 | Speaker - John Kozicz<br>J.R. Kozicz, Transocean                      |
| 0930 | Speaker - Paolo Allara<br>P. Allara, Saipem                           |
| 0930 | Speaker - Frederic Jacquemin<br>F.P. Jacquemin, Pacific Drilling      |
| 0930 | Speaker - John-Morten Godhavn<br>J. Godhavn, Statoil Gulf of Mexico   |
| 0930 | Speaker - Lance Labiche<br>L.C. Labiche, BSEE                         |
| 0930 | Moderator - Robert Ziegler<br>R.F. Ziegler, PETRONAS Carigali Sdn Bhd |
| 0930 | Speaker - Fráncisco Chavez V<br>F. Chavez V., DNV GL Group            |
|      | Moderator - Greg Carter<br>G.J. Carter, Nautilus Offshore Co. Inc.    |

## 044 Local and Global Solutions for Improving Safety Management Systems

604

Hosted by the Center for Offshore Safety and OTC, this event will provide two dynamic panel discussions focused on local and global solutions for improving safety management systems: • Panel 1: Safety Management Systems and Regulations around the Globe • Panel 2: Building on Safety Management Systems to Enhance Safety Culture As the global offshore energy industry continues to pursue improvements in safety management systems and safety culture, the industry has increased efforts to harmonize good safety management practices from around the globe. Members of the offshore energy industry and key stakeholders are working within their own organizations and together to promote operational excellence through improved safety management systems and safety culture. These panels, composed of global industry leaders, will discuss their experiences and strategies in advancing safety culture and harmonizing safety management systems to pursue operational excellence offshore.

### Session Chairperson(s):

Charles Williams, Center For Offshore Safety

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| 0930 | Moderator - Charlie Williams<br>C.R. Williams, Center For Offshore Safety |
| 0930 | Moderator - Jim Seale<br>J.W. Seale, Exxon Mobil Corporation              |
| 0930 | Speaker - Charlie Williams<br>C.R. Williams, Center For Offshore Safety   |
| 0930 | Speaker - Kathy Kanocz<br>K.A. Kanocz, Statoil Gulf Services LLC          |
| 0930 | Speaker - Taf Powell<br>T. Powell, IADC                                   |
| 0930 | Speaker - Patrick Toutain<br>P. Toutain, OGP                              |
| 0930 | Moderator - Dwight Johnston<br>D. Johnston, Shell                         |
| 0930 | Speaker - Dwight Johnston<br>D. Johnston, Shell                           |
| 0930 | Speaker - Jim Seale<br>J.W. Seale, Exxon Mobil Corporation                |
| 0930 | Speaker - Steve Thurston<br>S.P. Thurston, Chevron Corporation            |
| 0930 | Speaker - Richard Morrison<br>R.L. Morrison, BP                           |

## 045 Development in Geotechnical Engineering 602

### Session Chairperson(s):

Daniel Spikula, Geoscience Earth & Marine Svc

Zenon Medina-Cetina,

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|------|-------|--|
| 0930 | 25197 | Significant Ageing Effects for Axially Loaded Piles in Sand and Clay Verified by New Field Load Tests<br>K. Karlsrud, Norwegian Geotechnical Inst.; T.G. Jensen, E.K. Wensaas Lied, Norwegian Geotechnical Institute; F. Nowacki, Norwegian Geotechnical Institute (NGI); A.S. Simonsen, Multiconsult AS   |
| 0952 | 25160 | Estimation of Temporal Probability in Offshore Geohazards Assessment<br>F. Nadim, Norwegian Geotechnical Inst.; Y. Choi, NGI Inc.; C. Hadley, Shell Global Solutions US Inc.   |
| 1014 | 25286 | Pipeline Lateral Buckling: Realistic Modelling of Geotechnical Variability and Uncertainty<br>D. White, University of Western Australia; Z. Westgate, Advanced Geomechanics; Y. Tian, University of Western Australia  |
| 1036 | 25196 | Characterization of the Slope-destabilizing Effects of Gas-charged Sediment via Seismic Surveys<br>E. Morgan, Duke University; M. Vanneste, Norwegian Geotechnical Inst.; M. Vardy, School of Ocean and Earth Science, University of Southampton   |
| 1058 | 25378 | Case Study of Geotechnical Site Investigation using a Seafloor Drilling Unit, Large-diameter Cores, and Coring-vessel-deployed Cone Penetration Tests in the Gulf of Mexico<br>C. Caruthers, R. Hartsfield, A.G. Young, D. Spikula, J. Dobias, Forum Energy Technologies; M. Fitzpatrick, Hess Corporation; B. Remmes, INTECSEA                          |
| 1120 | 25206 | Centrifuge Study of Offshore Platform Response to Earthquake Excitations<br>R.W. Litton, Energo Engineering; M.E. Stringer, University of California, Davis; E.C. Clukey, BP Exploration; J. Chen, Energo Engineering; B.L. Kutter, University of California, Davis; D.W. Wilson, B. Zheng, University of California Davis; Y. Zhou, Zhejiang University |
| 1142 | 25272 | Overview and Assessment of Vertical Transport Systems<br>W. Boomsma, IHC Mining; A. Blanken, MTI Holland   |

## 046 Qualification of New Technologies - Managing the Risk of the Unknowns 312

Developing new technologies is vital for the oil and gas industry to meet increasing challenges of natural and social environments. Bringing these technologies to the market in a safe, reliable, and cost effective way relies on technology qualification. For decades, new technologies keep emerging to enable operators to use floating installations and subsea facilities to produce in deeper waters and harsher environments. Prescriptive codes and standards are published and closely followed for so-called proven equipment. The question remains as to what happens when new solutions push beyond the known codes and standards and how to evaluate the potential risks and determine acceptance criteria to an unknown performance of a new solution/technology. This session intends to discuss due diligence, systematic qualification process, and introduce success stories.

Session Chairperson(s):

Martha Viteri, DNV

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|------|-------|--|
| 0930 | 25419 | Using Technology Classification and Qualification Status as a Tool for Strategic Technology Screening and Selection<br>L. Huyse, Chevron   |
| 0952 | 25409 | Managing the Risk of the Unknowns: #197;sgard Subsea Compression Qualification Program<br>P.E. Hedne, Statoil ASA  |
| 1014 | 25170 | Obsolescence Management Through Technology Qualification Processes<br>J.M. Strouse, J. Sutherland, A. Botto, Wood Group Integrity Management   |
| 1036 | 25413 | Qualification Of A Cryogenic Floating Flexible Hose Enabling Safe And Reliable Offshore LNG Transfer For Tandem FLNG Offloading Systems<br>V. Lagarrigue, J. Hermary, Trelleborg; B. Mauries, Saipem                   |
| 1058 | 25422 | Qualification of UOE Linepipes with Enhanced Collapse Resistance<br>F. Arroyo Moreira, R.C. Silva, L.O. Mantovano, Tenaris; R.F. Solano, F.B. Azevedo, Petrobras; H. Alves, DNV  |
| 1120 | 25154 | Weldless Permanent Mechanically Attached Fittings for Subsea Hydraulic Piping<br>T.T. Amling, Parker Hannifin Corp. Tube Fittings Div.; A. Palanci, Parker Hannifin Corp.; W. Kovacs, Det Norske Veritas (U.S.A.), inc |
| 1142 | 25159 | Development and Qualification of a High-Pressure, High-Temperature Chemical Injection Valve<br>Z.Y. He, K. Yuan, Baker Hughes Inc; R. Rees, Co-Author  |

## 047 Mooring System Performance and Integrity Management

610

Mooring system performance and integrity management are topics that operators of floating production units can't ignore. The papers in this session report on practical developments in the subject area, including results of field-recovered mooring equipment.

Session Chairperson(s):

Marcus Krekel, Exmar

Subir Bhattacharjee, ExxonMobil Production Co.

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| 0930 | 25273 | Industry Survey of Past Failures, Pre-emptive Replacements and Reported Degradations for Mooring Systems of Floating Production Units<br>E. Fontaine, AMOG Consulting, Melbourne; A. Kilner, AMOG Consulting; C. Carra, AMOG Consulting, Melbourne; D. Washington, AMOG Consulting; K. Ma, Chevron Corporation; A. Phadke, ConocoPhillips; D. Laskowski, ConocoPhillips; G. Kusinski, Chevron |
| 0952 | 25375 | Microbiologically Influenced Corrosion in Mooring Systems - Field Experience<br>T. de Gier, Welaptega Marine Ltd.; A.D. Hall, Welaptega Marine Ltd; S. Allan, Welaptega Marine Ltd.   |
| 1014 | 25234 | SCORCH JIP - Feedback on MIC and Pitting Corrosion from Field Recovered Mooring Chain Links<br>E. Fontaine, J. Rosen, A. Potts, AMOG Consulting; K. Ma, Chevron Corporation; R.E. Melchers, University of Newcastle In Australia  |
| 1036 | 25282 | SCORCH JIP - Feedback from Field Recovered Mooring Wire Ropes<br>J. Rosen, A.E. Potts, E. Fontaine, AMOG Consulting, Melbourne; K. Ma, Chevron Corporation; C.R. Chaplin, University of Reading; W. Storesund, DNV GL   |
| 1058 | 25134 | Mooring Integrity Management: A State-of-the-Art Review<br>R.B. Gordon, M.G. Brown, E.M. Allen, DNV GL  |
| 1120 | 25219 | A Model Test Ice Resistant Study of FPSO And Yoke Mooring System In Ice Influenced Areas of Bohai Bay<br>T. Li, J. Li, CNOOC  |

## 048 Global Review and Exploration for Methane Hydrates

606

When methane hydrates are developed they will be a natural gas source of immense size and potential in comparison with conventional resources. Their major commercial development appears to be less than a decade away.

Session Chairperson(s):

Timothy Collett, U.S. Geological Survey

Thomas Reichel,



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|------|-------|--|
| 0930 | 25192 | Developments in Marine Gas Hydrate Exploration<br>R. Boswell, U.S. Dept. of Energy   |
| 0952 | 25144 | Global Screening of Gas Hydrates<br>T. Reichel, J.W. Gallagher, Statoil ASA  |
| 1014 | 25242 | Reservoir Controls on the Occurrence and Production of Gas Hydrates in Nature<br>T.S. Collett, U.S. Geological Survey  |
| 1036 | 25318 | Seismic Investigation of Gas Hydrates in the Gulf of Mexico: 2013<br>Multicomponent and High-Resolution 2D Acquisition at GC955 and WR313<br>S.S. Haines, P. Hart, USGS; W.W. Shedd, Bureau of Ocean Energy Mgmt<br>Regulation&Enforcement; M. Frye, Bureau of Ocean Energy Mgmt |
| 1058 | 25139 | Thermodynamic State of Gas Hydrate in the Krishna-Godavari Basin Inferred<br>From Well Log Analysis<br>D.W. Meyer, P.B. Flemings, University of Texas At Austin  |
| 1120 | 25252 | Determining Methane Hydrate Equilibrium Conditions in Sediments from the<br>Nankai Trough<br>M.A. Nole, H. Daigle, University of Texas At Austin   |
| 1142 | 25328 | A Deepwater Sandface Monitoring System for Offshore Gas Hydrate Production<br>S. Chee, T. Leokprasirtkul, T. Kanno, O. Osawa, Y. Sudo, M. Takekoshi, H. Yu,<br>Schlumberger Kabushiki Kaisha (SKK); K. Yamamoto, Japan Oil, Gas & Metals<br>Natl. Corp.                          |

## 049 Advances in Subsea Umbilicals

### 600

Several advances in umbilical technology have resulted in reduction of costs, increased water depths, new materials, and standardization of the umbilical and cable industry.

#### Session Chairperson(s):

Lisa Medeiros, OYO Geospace Corporation

Mark Kalman, DeepFlex Inc

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|------|-------|--|
| 0930 | 25340 | Ultra-High Conductivity Umbilicals: Polymer Nanotube Umbilicals<br>C. Dyke, NanoRidge Materials, Inc.; E. Barrera, Rice University; D. Madden,<br>DUCO Inc.      |
| 0952 | 25333 | Developments in Computational Methods for Assessing Fatigue Life of Flexibles<br>and Umbilicals<br>M. Dhaigude, P.P. Sharma, Det Norske Veritas (USA) Inc.       |
| 1014 | 25291 | Installability of Umbilicals<br>M. Pereira, P. Ramar, M.A. Dixon, McDermott Subsea   |
| 1036 | 25181 | An Innovating Premium Tubular Solution For Umbilical's Applications<br>O. Wagner, Vallourec; J. Roques, H. Romazzotti, TOTAL; H. Evin, J. Peultier,<br>Vallourec |

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|------|-------|---|
| 1058 | 25370 | Carbon Nanotube Composite Cables For Ultra-deepwater Oil And Gas Fields<br>T.G. Holesinger, Los Alamos National Laboratory  |
| 1120 | 25323 | Direct bonding, adhesive-free Multilayer Thermoplastic Systems for Oil & Gas Pipelines, Risers and Umbilicals<br>J. Berger, J. Franosch, A. Dowe, Evonik Industries AG    |
| 1142 | 25431 | Challenges Associated with Electrical and Optical Cable Terminations and Connector Systems for the Drilling Industry<br>G. Brown, K. Lewis, SEACON Advanced Products, LLC |

## **Thursday, 8 May 2014, 1400–1630**

### **050 A Look-Back at Offshore Megaprojects**

**306**

As the size, complexity, difficulty, and risk of offshore developments continue to increase, it is important to look back at the industry's experience with these mega-projects. While offshore technical capabilities continue to advance, the ability to plan, execute, and operate these mega-facilities has struggled to keep pace. Our ability to learn from experience and continuously improve is a key success factor as developments continue into more challenging technical and operational environments. This panel will bring together executives from major players in global deep-water developments to discuss experiences and learnings in three categories: technical, development, and operational.

Session Chairperson(s):

Flora Yiu, Anadarko Petroleum Corporation

Richard Westney, Westney Consulting Group, Inc.

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|------|---|
| 1400 | Speaker - Tom Ayers<br>T. Ayers, Technip                                    |
| 1400 | Speaker - Gary Fischer<br>G.W. Fischer, Chevron Project Resources Company   |
| 1400 | Speaker - Bob Buck<br>B.J. Buck, Anadarko Petroleum Corp                    |
| 1400 | Moderator - Richard Westney<br>R.E. Westney, Westney Consulting Group, Inc. |

### **051 Offshore Brownfield Rejuvenation**

**604**

The Offshore Brownfield Rejuvenation session will provide experiences with field life extension as well as provide various techniques and case histories on maximizing value of mature producing assets. Some specific topics include the structural integrity assessment of FPSO life extension and relocation and ESP gas handling technology to increase oil production.

Session Chairperson(s):

Robert McCavitt, Chevron Corporation

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|------|-------|---|
| 1400 | 25082 | Experience from Field Life Extension<br>E. Tveit, H. Sivertsen, S. Hernæs, FMC Technologies   |
| 1422 | 25105 | Comprehensive Adjustment Techniques Based on Detailed Oil Distribution<br>Enhance Oil Recovery at Mature Offshore Field<br>L. Tingli, Y. Wang, X. Liao, C. Zhao, Q. Yang, Y. Su, Y. Hu, W. Qin, Y. Xu, X. Bie, C. Liu, J. Su, Y. Zhang, R. Fu, D. Yu, W. Zhang, CNOOC |
| 1444 | 25324 | ESP Gas Handling Technology Increases Oil Production Over 100% in a Mature<br>Reservoir in the Gulf of Mexico: A Case History<br>A.H. Cardona, S.C. Fry, Baker Hughes Inc; R.R. O'Quinn, Baker Hughes   |
| 1506 | 25444 | Optimizing Productivity In Mature Field Production<br>J. Leis, E. Phillips, Bain & Co.  |
| 1528 | 25141 | Extending Wealth Creation Through Effective Project Management Strategy In<br>The Oil And Gas Industry<br>P.I. Ibe, Technology Experts LLC  |
| 1550 | 25227 | Project Management, Local Content and Value Delivery<br>F.E. Idachaba, Covenant University Ota; E. Wokoma, Shell Petroleum<br>Development Company   |
| 1612 | 25311 | Structural Integrity Assessment of FPSO Life Extension and Relocation<br>X. Wang, H. Sun, ABS; S. Lee, Chevron  |

## 052 Offshore Pipelines

602

### Session Chairperson(s):

John Bomba, Technip

Jason McClure, Chevron Products Co.

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|------|-------|---|
| 1400 |       | Invited Presenter - Neil Mackintosh<br>N. Mackintosh, Genesis   |
| 1422 | 25124 | Post-installed Mudmat<br>E. Fontaine, S. Dilosquer, subsea 7  |
| 1444 | 25087 | Formulating Guidance on Hydrotesting Deepwater Oil and Gas Pipelines<br>F. Kopp, Shell Intl. E&P BV; R.R. Ayers, Stress Engineering Services  |
| 1506 | 25175 | Middle East India Deepwater Pipeline (MEIDP) crossing of the Indus Fan<br>I.F. Nash, Peritus International Ltd  |
| 1528 | 25186 | Earthquake Response of Pipelines on Submarine Slopes<br>A.M. Kaynia, Norwegian Geotechnical Institute; P. Dimmock, BP Exploration; M. Senders, Woodside Energy Ltd.   |
| 1550 | 25211 | Challenges of Lowering a Live Subsea Buried Gas Pipeline by 6m<br>N.I. Thusyanthan, OIS Ltd; K.A. Willaims, Vision oil and Gas; T. Selwood, OIS Ltd;<br>P. Smith, NCS Survey Ltd; S. Jegandan, INTECSEA; D.J. Robert, Monash University |

1612 25265 Field Development using Semisubmersible Floating Production System with Steel Catenary Risers in Western Australia Harsh Environment  
A.M. Mansour, S. Bhat, D.R. Pasala, D. Kumar, INTECSEA, WorleyParsons Group

### **053 Subsea Power: Subsea Electrical Power Distribution**

#### **312**

The Subsea Electrical Power Distribution session encompasses distribution system architecture, active production technology, protection systems for the field, field expansion, choice of type of power (AC or DC), and connector technology. These papers will explore current field and architecture system, as well as, potential future generation of power distribution.

Session Chairperson(s):

Glenn Macdonald, Stress Subsea, Inc.

Marcelo Bromberg, Aerojet Rocket - Extreme Engineering

- 1400 25314 Advances in Power Feedthrough Connector Technology for HP ESP Applications  
A. Nicholson, Onesubsea
- 1422 25171 Investigation of Next Generation Subsea Power Distribution System Architectures  
Y. Duan, FMC Technologies Inc; W. Forrest, X. Li, H. Ulvestad, FMC Technologies
- 1444 25329 How Subsea Constraints Influence Design Choices for Protection Systems  
T. Hazel, P. Andrea, D. Goulielmakis, Schneider Electric
- 1506 25278 Hybrid "Split" VFD Poses to Significantly Extend Subsea Processing Tieback Distance  
R.W. Voight, INTECSEA Engineering
- 1528 25320 Operation Of Subsea Electrical Power Systems  
N. Soelvik, A.M. Askeland, OneSubsea
- 1550 25263 A Modular Subsea DC Electrical Power System  
R. Lai, D. Zhang, D. Dong, S. Chi, M. Harfman Todorovic, GE Global Research; G. Ranjan, GE Global Research; L. Garces, GE Global Research; S. Gunturi, GE Transportation; R. Datta, T. Wijekoon, GE Global Research; C. Sihler, GE Global Research; S.E. Rocke, GE Oil & Gas - Subsea; K.M. Elgsaas, GE Oil & Gas; E. Savarit, A. Arungalai, GE Power Conversion; J. Song-manguelle, ExxonMobil; J.M. Pappas, RPSEA
- 1612 25129 Li-Ion Batteries for Energy Storage and Hybrid Power: Safety and Suitability Considerations Offshore Applications  
D.M. Hill, DNV; B. Gully, A. Agarwal, DNV GL

## 054 Offshore Wind and Wave Energy

610

This session highlights important developments in research and application of offshore wind and wave energy.

Session Chairperson(s):

James Dailey, Technip Offshore Inc.

Ziv Lang, California Air Resources Board

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|------|-------|--|
| 1400 |       | Invited Presenter - Greg Matzat<br>G. Matzat, U.S. Department of Energy  |
| 1422 | 25146 | Wave Energy Research, Development and Testing Including Testing of Materials and Technologies for Bio-Fouling and Corrosion Prevention<br>A. Von Jouanne, J. Baker, S. Yim, Oregon State University; E. Amon, OSU; S. Moran, T. Lettenmaier, Oregon State University; M. Bunn, A. Yokochi, OSU |
| 1444 | 25397 | Numerical Simulation of Floating Offshore Wind Turbines Including Aero-Elasticity and Active Blade Pitch Control<br>B. Wilder, Texas A&M University At Galveston; B. Sweetman, Texas A&M University  |
| 1506 | 25229 | Implications Of New Code Versions To Pile Fatigue Assessment<br>J. Chung, R. Wallerand, M. Helias-Brault, Subsea 7   |
| 1528 | 25284 | Wind-powered Subsea Water Injection Pumping: Technical and Economic Feasibility<br>J. Slätte, J. Sandberg, T.A. Flach, G. Dekker, C. Sixtensson, DNV GL  |
| 1550 | 25148 | Wave Energy Converter (WEC) - Formulation of Numerical Method to Predict Fluid-Structure Interaction and Wave Energy Potential<br>J. Gullaksen, JG Maritime Engineering Ltd.   |
| 1612 | 25156 | In Depth Cost of Energy Analysis of East Coast Offshore Wind Farms<br>C. Drenick, I. Prowell, D.K. Dolan, MMI Engineering  |

## 055 Modeling and Laboratory Studies for Methane Hydrates

606

Methane hydrates do not follow conventional gas development models. This session will consider current numerical simulations and lab studies to better understand this future resource.

Session Chairperson(s):

Carolyn Koh, Colorado School of Mines

George Moridis, Lawrence Berkeley Laboratory

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| 1400 | 25155 | Assessing Well Integrity using Numerical Simulation of Wellbore Stability During Production in Gas Hydrate Bearing Sediments<br>X. Long, K. Tjok, Fugro GeoConsulting Inc.; C.S. Wright, Chevron Indonesia Company; A. Witthoeft, Fugro GeoConsulting Inc. |
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|------|-------|---|
| 1422 | 25169 | Numerical Study on Eastern Nankai Trough gas Hydrate Production Test<br>M. Zhou, K. Soga, X. Ermao, University of Cambridge; S. Uchida, Technion- Israel Institute of Technology; K. Yamamoto, Japan Oil, Gas & Metals Natl. Corp.                                  |
| 1444 | 25208 | Numerical Analysis Of Wellbore Behaviour during Methane Gas Recovery from Hydrate Bearing Sediment<br>E. Xu, K. Soga, M. Zhou, University of Cambridge; K. Yamamoto, Japan Oil, Gas & Metals Natl. Corp.; S. Uchida, Technion- Israel Institute of Technology Haifa |
| 1506 | 25237 | An Experimental Study for Flow Assurance of the Methane Hydrate Production Test System<br>S. Sakurai, Y. Nakatsuka, Japan Oil, Gas and Metals National Corporation; T.J. Edwards, B.J. Hoskin, D.K. Manning, Oilfield Production Technologies                       |
| 1528 | 25185 | Experimental Study On Compression Indices Of Gas Hydrate-bearing Sediments<br>H. Kim, G. Cho, Korea Advanced Institute of Science and Technology (KAIST)  |

## **056 Underwater Monitoring Network: Strategy and Case Studies**

**600**

The aim of this session is to evaluate the actual maturity of the different available or under development strategies and technologies related to underwater monitoring networks.

Session Chairperson(s):

Eric Cauquil, Total

James Strout, Norwegian Geotechnical Inst.

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|------|-------|---|
| 1400 | 25103 | Gap analysis for the development of a Geohazard Monitoring and Warning System<br>E.C. Cauquil, Total  |
| 1422 | 25221 | The Devil Is In The Details - Lessons Learned From Design Failures In Underwater Monitoring Systems<br>J. Strout, P.M. Sparrevik, NGI (Norwegian Geotechnical Institute)  |
| 1444 | 25341 | Designing a Permanent Underwater Monitoring Network For Leak Detection<br>J.M. Strout, P.M. Sparrevik, S. Hayes, Y. Kvistedal, D. Tollefsrud, NGI (Norwegian Geotechnical Institute)  |
| 1506 | 25116 | Challenges, Benefits And Solutions In Holistic Oil Field Monitoring.<br>H. Brandsaeter, OCTIO AS  |
| 1528 | 25151 | Long Term Deepwater Environmental Monitoring Off Angola - Data Management Strategy<br>A.H. Walls, J. Clarke, S. Oliveira, R. OBrien, BP; K. Smith, MBARI; I. Priede, University of Aberdeen Oceanlab; M. Vardaro, Oregon State University; G. Rowe, Texas A&M; D. Bailey, Glasgow University; H. Ruhl, NOC; B. Sangolay, INIP |

- 1550 25417 Canada's Cabled Ocean Observatories  
K. Moran, Ocean Networks Canada; S. McLean, Ocean Networks Canada  
Innovation Centre
- 1612 25346 Underwater Monitoring Network  
A. Brevik, Kongsberg Maritime SUBSEA