

24 - 25 October 2017 | Johnson GEO CENTRE | St. John's, Newfoundland and Labrador, Canada

Well Integrity Life Cycle Management for Subsea Field Development

Life cycle well integrity management is a requirement for onshore, offshore and subsea wells that provides for the license to operate specifically in environmental critical areas. It is a multi-disciplinary effort that has several stakeholders and phases of application. It is an endeavor that requires diligent planning throughout the phases of field development. Well integrity is often managed as part of the production and maintenance life cycle.



During the design, construction materials are selected on the information available at the time of the field development plan. Lessons learned from the production life cycle are at times used for further field development, if time permits. Additionally, the ineffective transition of knowledge set and longer well lifespan increases the exposure to more serious well integrity issues.

Once a well integrity issue is observed, there are sometimes no considerations for how to treat the integrity issue, especially within areas of limited access. The process to assess the current state of a well and provide an assurance of continued integrity continues to be a challenge for the industry.

The workshop objective is to raise the level of awareness of the individual life cycle elements and address these through examples of each life cycle phase and provide a basis for discussion of what is required to improve the effectiveness of well integrity throughout all phases. This workshop will also have a focus on subsea well integrity as that is the predominant form of development within the region.

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Well Integrity Life Cycle Management for Subsea Field Development

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Lesley James

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Robert Jobling

Avara Solutions Inc.

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On behalf of the Well Integrity Life Cycle Management for Subsea Field Development Workshop Committee and invited speakers, SPE Canada is pleased to make a donation of \$800 to Samaritan's Purse. This organization is providing support to hurricane victims in the US and Caribbean islands through emergency relief efforts and assisting Canadians who lost homes in the BC Fires. This donation has been made at the request of the committee, in lieu of speaker and committee gifts. www.samaritanaspurse.ca

GENERAL INFORMATION

About Society of Petroleum Engineers

The Society of Petroleum Engineers (SPE) is a not-for-profit professional association for members engaging in oil and gas E&P, providing resources for technical knowledge. Income from this event will be invested back into SPE to support many other member programs. Scholarships, certification, the Distinguished Lecturer program, and SPE's energy education program Energy4me are just a few examples.

Accessibility

Our events and functions are accessible to all attendees with wheelchairs. If you require special arrangements, please contact our staff at the registration desk.

Commercialism

In remaining consistent with workshop objectives and SPE guidelines, commercialism in presentations will not be permitted. Company logos should be used only to indicate the affiliation of the presenter(s).

Continuing Education Units

Attendees will receive 1.6 CEUs. One CEU equals 10 contact hours of participation. CEUs will be awarded through SPE Professional Development for participation and completion of SPE workshop. A permanent record of a participant's involvement and awarding of CEUs will be maintained by SPE.

Documentation

Following the workshop a URL containing released copies of the workshop presentations will be available to all attendees.

SCHEDULE OVERVIEW

TUESDAY, OCTOBER 24

0700-0750 | Registration and Breakfast

0750-0800 | Opening Remarks

0800-0830 | Opening Keynote

0830-1000 | **Session 1: Well and System Design**

1000-1030 | Coffee Break

Sponsored by:  Seal-Tite,
International
Engineered Sealing Solutions

1030-1200 | **Session 2: Well Integrity During Well Construction**

1200-1300 | Networking Lunch

1300-1430 | **Session 3: Well Integrity During Well Production**

1430-1500 | Coffee Break

Sponsored by:  Seal-Tite,
International
Engineered Sealing Solutions

1500-1630 | **Session 3: Continued...**

1630-1800 | Networking Reception

WEDNESDAY, OCTOBER 25

0700-0800 | Registration and Breakfast

0800-0930 | **Session 4: Remediation and Treatment**

0930-1000 | Coffee Break

Sponsored by:  Seal-Tite,
International
Engineered Sealing Solutions

1000-1130 | **Session 4: Continued...**

1130-1245 | Lunch and 2017 SPE Regional Awards

1245-1415 | **Session 5: Well Abandonment**

1415-1445 | Coffee Break

Sponsored by:  Seal-Tite,
International
Engineered Sealing Solutions

1445-1615 | **Session 6: Subsea Tree and Equipment Integrity, Roundtable Panel Session**

GENERAL INFORMATION

Electronic Devices

As a courtesy to the speakers and your fellow registrants, please turn off all electronic devices during presentations.

Name Badges

Please wear your badge at all times. It is a courtesy to your fellow registrants, speakers and sponsors.

Photography and Recording Policy

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permission to use your image in possible future marketing publications including print, online, and video.

Workshop Format

Workshops maximize the exchange of ideas among attendees and presenters through brief technical presentations followed by extended Q&A periods. Focused topics attract an informed audience eager to discuss issues critical to advancing both technology and best practices.

Many of the presentations are in the form of case studies, highlighting engineering achievements and lessons learned. In order to stimulate frank discussion, no proceedings are published and members of the press are not invited to attend.

Well Integrity Life Cycle Management for Subsea Field Development

TECHNICAL AGENDA

TUESDAY, OCTOBER 24

0700-0750 | Registration and Breakfast

0750-0800 | Opening Remarks
Moderator: **Andrew Montes, Husky Energy**

0800-0830 | **Opening Keynote: Well Integrity Life Cycle Management for Subsea Field Development – A Regulator’s Perspective**



John Kennedy, C-NLOPB

0830-1000 | **Session 1: Well and System Design**

Session Chairs: **Babatunde O Yusuf, Nalcor Energy Oil and Gas Inc.**
Lesley James, Memorial University
Jennifer Fallon, Husky Energy

Well designs typically commence with data collection and establishment of the design premises. At this stage, it is imperative to understand well integrity issues, casing seats depth selection methods, as well as other important completion and production requirements. This session explores the design of a plan to last for the entire life of the well; defining loads that it may be subjected to at later stages, wellbore fracture and collapse modeling, drilling fluids consideration, optimal mud weight selection, hole cleaning, hydraulic optimization, and methods to handle lost circulation.

- **Presentation 1: ISO 16530-1: Well Integrity Standard**
Alex Crabtree, Hess Corporation
- **Presentation 2: Well Integrity Considerations during the Design Phase**
Valerie Wilson
- **Presentation 3: Well Head Fatigue, New Variable in Well Design**
Max Russo, Kongsberg

1000-1030 | Coffee Break

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1030-1200 | **Session 2: Well Integrity During Well Construction**

Session Chairs: **Gunnar DeBruijn, Schlumberger**
Dave Griffin, Schlumberger

Well construction sets the foundation for Well Integrity through the life of the well. This session will focus on well delivery, including well drilling, barrier installation and completions prior to the rig leaving the wellsite. The rig delivers the well that has been designed, and details are documented for reference for the remainder of the well life. An example of real-time monitoring of barrier installation (cement) will be discussed, along with well quality objectives, and key performance indicators for the well as delivered after drilling and completion. This session naturally fits between sessions on Well Design, and Well Production.

- **Presentation 1: Real-Time Cement Monitoring: The New Concept for Deepwater Cement Barrier Placement. Case Studies from the Gulf of Mexico and Atlantic Canada**
Vitor Villar, Schlumberger
- **Presentation 2: Ensuring Well Integrity at Well Delivery**
Faisal Rashid, Abu Dhabi National Oil Company (ABNOC)
- **Presentation 3: B-Annulus Protection on Subsea Wells: History, Challenges and Solutions**
Paul Hazel, Welltec

1200-1300 | Networking Lunch

1300-1430 | **Session 3: Well Integrity During Well Production**

Session Chairs: **Lesley James, Memorial University**
Philip Stemler, Suncor Energy

Well monitoring and surveillance during production starts before the well comes online and needs to continue through well abandonment. Production may exceed expected life during which fluids may change, both having impact on well integrity. This session give an overview of well monitoring and surveillance introducing the key points of having a well monitoring plan and quality assurance program including the importance of risk assessments, managing change and reporting. Technically, the session will discuss well barriers, changing pH on well integrity and corrosion, the need to include fugacity in our modelling of fluid-well interactions, and modelling corrosion in the well.

- **Presentation 1: Well Monitoring and Surveillance Overview and Key Points**
Valerie Wilson
- **Presentation 2: Well Integrity Surveillance Method, Insitu PH**
Philip Stemler, Suncor Energy
- **Presentation 3: The Role of Speciation and Fugacity**
Chris Harper, Baker Hughes a GE company

1430-1500 | Coffee Break

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1500-1630 | **Session 3: Continued...**

Session Chairs: Lesley James, Memorial University
Phillip Stemler, Suncor Energy

Well monitoring and surveillance during production starts before the well comes online and needs to continue through well abandonment. Production may exceed expected life during which fluids may change, both having impact on well integrity. This session give an overview of well monitoring and surveillance introducing the key points of having a well monitoring plan and quality assurance program including the importance of risk assessments, managing change and reporting. Technically, the session will discuss well barriers, changing pH on well integrity and corrosion, the need to include fugacity in our modelling of fluid-well interactions, and modelling corrosion in the well.

- **Presentation 1:** Water Injector Paradigm Shift (incl. 1% chrome)
Phillip Stemler, Suncor Energy
- **Presentation 2:** Internal Corrosion Predictive Modeling (ICPM) Offshore Downhole OCTG's using enpICDA™
Pat Tevens, Broadsword Energy
- **Presentation 3:** Key Lessons Learned on Well Integrity
Valerie Wilson

1630-1800 | Networking Reception



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WEDNESDAY, OCTOBER 25

0700-0800 | Registration and Breakfast

0800-0930 | **Session 4: Remediation and Treatment**

Session Chairs: **Mike Briffett, Avara Solutions Inc.**
Robert Jobling, Avara Solutions Inc.

This session covers topics associated with well integrity after an integrity issue has been identified. This requires mobilization of people, equipment, and processes to treat the and remediate the integrity issue. This session will discuss case studies of well integrity interventions and discuss techniques and technologies available for future remediation activity.

- **Presentation 1:** Terra Nova: Canada's First use of Light Well Intervention Vessel (LWIV) Technology
Elvis Chippett, Suncor Energy
- **Presentation 2:** Rigless Intervention through Injection Choke Inserts on Subsea Fields
Phillip Rice, OneSubsea, A Schlumberger Company
- **Presentation 3:** A Subsea Well Intervention Challenge Offshore Newfoundland & Labrador
Ferry Smits, Halliburton

0930-1000 | Coffee Break

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1000-1130 | **Session 4: Continued...**

Session Chairs: **Mike Briffett, Avara Solutions Inc.**
Robert Jobling, Avara Solutions Inc.

This session covers topics associated with well integrity after an integrity issue has been identified. This requires mobilization of people, equipment, and processes to treat the and remediate the integrity issue. This session will discuss case studies of well integrity interventions and discuss techniques and technologies available for future remediation activity.

- **Presentation 1:** Light Well Intervention Operations
Neil Greig, Helix WelOps (LWIV)
- **Presentation 2:** Recent Subsea Leak Repairs Using Pressure-Activated Sealant Technology
Chris Anderson, Seal-Tite International
- **Presentation 3:** Completion Fluids Impacts on Flow Assurance and Operational Strategies
Jacqueline Vinicombe, Assured Flow Solutions, LLC

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1130-1245 | Lunch and 2017 SPE Regional Awards

Cam Matthews, the Regional Director for the SPE Canada Region, will be giving out awards during lunch. Three of our recipients for the 2017 SPE Regional Awards – Canada region are from and located in the Atlantic and Maritimes Sections and they will be recognized in person.

Recipients:**Winner of Young Member Outstanding Service Award**

- **Javad Hashemi**, Memorial University of Newfoundland

Winner of Regional Service Award

- **Babatunde O Yusuf**, Nalcor Energy Oil and Gas Inc.

Winner of Regional Service Award

- **Edwin Macdonald**, St. Brendan's Exploration Ltd.

1245-1415 | **Session 5: Well Abandonment**

Session Chairs: Steve Butt, Memorial University
Alex Crabtree, Hess Corporation

This session covers a range of topics dealing with well plugging and abandonment, including the practices and standards for well design to prevent migration of fluids between well intervals, methods to identify and rehab leaking and problematic zones or intervals,

regulatory requirements for P and A, and practices for long term monitoring and surveillance after abandonment.

- **Presentation 1: What is the Sealing Ability of Plugs?**
Torbjørn Vrålstad, SINTEF/DrillWell
- **Presentation 2: Riserless Subsea Abandonments for Effective and Cost Effective Well Integrity**
Joseph Savoy, Wild Well
- **Presentation 3: Abandonment Plugs – How Many are Needed?**
Alex Crabtree, Hess Corporation

1415-1445 | Coffee Break

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Well Integrity Life Cycle Management for Subsea Field Development

1445-1615 | **Session 6: Subsea Tree and Equipment Integrity, Roundtable Panel Session**

Session Chairs: Phillip Stemler, Suncor Energy

This session will be present and support an interactive discussion on current and future challenges that subsea equipment can face in the future. The goal is to learn what tools do exist to aid in solving aging wellheads and to discuss where the trends are going for future maintenance. The goal is to provide the workshop with real world understanding of how subsea trees, the key barrier element, can be expected to perform this vital function.

- **Presentation 1:** How Industry Handles Wellhead Fatigue
Max Russo, Kongsberg
- **Presentation 2:** Barrier Valve Integrity Assurance Through Remote Monitoring Systems
Arjun Visakh, Aditya Narayanan and Hugh Parry, TechnipFMC
- **Presentation 3:** Reliability and Testing of Subsea X-mas Tree Valves, Impact on Well Integrity
Kjell Corneliussen and Per Holand, ExproSoft AS



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In 2016, the SPE Canadian Educational Trust was converted into a new entity, the SPE Canadian Educational Foundation (SPECEF). With the new governance structure, SPECEF has the flexibility to create new programs, scholarships and energy educational initiatives that will benefit SPE Canada members.

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