SPE WORKSHOP

Society of Petroleum Engineers

13–14 June 2017 | BMO Centre at Stampede Park | Calgary, Alberta, Canada

SPE Workshop: Enhancing Life Cycle Costs of Thermal Wells Through Drilling and Completions

Challenged by the market turmoil caused by oil price volatility and tight global financial markets, the In-Situ Thermal Heavy Oil industry must find a way to become more competitive. It is only through increasing operational efficiency, decreasing NPT, reducing cost through well designs or new technology, elevating reliability and enhancing communication that we will be able to compete on a world scale. By integrating Engineering and Operations in both slant and vertical thermal developments, Drilling and Completions will deliver on efficiency measures through collaborative interaction with each other and by accessing the knowledge of the industry.

OBJECTIVES

This two-day workshop will bring together operators, service companies, regulatory authorities, research bodies, academia, and other interested parties in an open and collaborative environment. The first day of this workshop offers two tracks – one focused specifically on Drilling and the other on Completions. The second day brings together attendees for shared learnings on topics related to both disciplines, and the dynamic discussions that will follow these presentations. This workshop will take a holistic approach that includes the integration of geosciences with reservoir, completion, and production engineering disciplines.

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SPE Workshop: Enhancing Life Cycle Costs of Thermal Wells Through Drilling and Completions

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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.

COMMITTEE MEMBERS

Drilling Committee

Co-Chairs
Marius Bordieanu, Suncor Energy

Doug Hollies, Codeco Oilsands Engineering

Jeff Arvidson, Devon Energy

Arnie Canonigo, MEG Energy

Gregori Colomine, Nexen Energy ULC

Bryan Hnatiuk, Decades Upstream Consulting Services Ltd.

Owen Hnatiuk

Stephen Lai, Pason Systems

Juan Pablo Martin, Tenaris

Harry Schaepsmeyer

Blair Stengler, Devon Energy

Jaleh Zadeh

Completions Committee

Co-Chairs
Kurtis Thompson, MEG Energy

Colby Sutton, RGL Reservoir Management

Matt Crockett, Suncor Energy

Jonathan Heseltine, C-FER Technologies

Nicholas Miles, Weatherford

Blair Neil, Exceed Oilfield Equipment

Alexandra Robertson, Nexen Energy ULC

Mitchel Stretch, Schlumberger

Pat Webb, Devon Energy

Adam Welty, Armour Valve

Gina Wozney, GRW Consulting Ltd.

GENERAL INFORMATION

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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.

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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.

When we share diverse thoughts, backgrounds and passions, we all create something much larger than ourselves. It's this type of collaborative approach that has shaped Canada into what it is today. At Suncor, we believe the best way to build Canada's future is by working together.

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201705-057

SCHEDULE OVERVIEW

TUESDAY, JUNE 13

0700–0800	Registration and Breakfast	
0800–0845	Opening Remarks and Keynote Presentation	*Palomino C*
0900-1030	**Session 1**	
	Drilling Track: Directional Drilling	*Palomino C*
	Completions Track: Thermal Well Design	*Palomino D*
1030-1100	Coffee Break	*Palomino Foyer*
1100-1230	**Session 2**	
	Drilling Track: Drilling Operations	*Palomino C*
	Completions Track: Artificial Lift Strategies	*Palomino D*
1230-1330	Keynote Lunch	*Palomino C*
1330–1500	**Session 3**	
	Drilling Track: Cement Operations and Technology	*Palomino C*
	Completions Track: Workovers	*Palomino D*
1500–1530	Coffee Break	*Palomino Foyer*
1530–1700	**Session 4**	
	Drilling Track: Thermal Well Construction - Casing and Liners	*Palomino C*
	Completions Track: Design and New Technologies	*Palomino D*
1700–1800	Networking Reception	*Palomino Foyer*

WEDNESDAY, JUNE 14

0700–0800	Registration and Breakfast	
	Combined Drilling and Completions Track	
0800–0930	**Session 5 – Re-Entries and Re-Drills**	*Palomino C*
0930–1000	Coffee Break	*Palomino Foyer*
1000–1130	**Session 6 – New Thermal Production Systems**	*Palomino C*
1130–1300	Networking Lunch	*Palomino D*
1300–1430	**Session 7 – Operational Project Execution Efficiencies**	*Palomino C*
1430–1500	Coffee Break	*Palomino Foyer*
1500–1630	**Session 8 – Production Optimization**	*Palomino C*

SPE Workshop: Enhancing Life Cycle Costs of Thermal Wells Through Drilling and Completions

TECHNICAL AGENDA

TUESDAY, 13 JUNE

0700–0800 | Registration and Breakfast

0800-0815 | Opening Remarks - Workshop Chairs

0815–0845 | **Keynote Presentation:** Why are SAGD Wells Not All Created Equal: Asset Design Criteria for Drilling and Completing Suncor's Wells Through the Lifecycle
John Graham, Suncor Energy

Drilling Track

0900-1030 | Session 1: Directional Drilling

Session Chairs: **Gregori Colomine**, Nexen Energy ULC
Owen Hnatiuk

With depressed commodity prices, maximizing recoverable resources has become critically important to increasing project value and accurate cost-effective wellbore placement is fundamental to this process. This session discusses recent advances in SAGD ranging technologies, wellbore positioning survey techniques and the use of empirical data to increase positional certainty.

- **Presentation 1:** Why Your Wells Are Not Where You Think They Are
  Angus L. Jamieson, University of the Highlands and Islands
- **Presentation 2:** A New Well Positioning Technique for SAGD Applications
  Sean Hinke, Halliburton
- **Presentation 3:** Absolute Wellbore Placement via No-Access Ranging from Surface
  Clinton Moss, Scientific Drilling International

1030-1100 | Coffee Break Sponsored by: DELTA™ SCREENS

1100-1230 | Session 2: Drilling Operations

Session Chairs: **Jeff Arvidson**, Devon Energy
Arnie Canonigo, MEG Energy

SAGD drilling operations have many opportunities for efficiencies due to the repetitive nature of the process. This session will explore some technologies and techniques that have compressed drilling schedules without compromising quality or safety.

- **Presentation 1:** Operational Efficiency
  George McHardy, Nabors
- **Presentation 2:** Lodestone Active Ranging System
  Clinton Moss, Scientific Drilling International
- **Presentation 3:** Maximizing Extended Reach Drilling Efficiency with Unconventional Thinking
  Sean Hinke, Halliburton

Completions Track

0900-1030 | Session 1: Thermal Well Design

Session Chairs: **Mitch Stretch**, Schlumberger
Kurtis Thompson, MEG Energy

This first session of the workshop is intended to focus on well design for full life cycle operating scenarios and to consider the range of well completion selection strategies, but from a more rigid "manufactured" design perspective to allow cost effective repeatability. The manufacturing approach versus the trade-off required to ensure a broad range of operating conditions will be discussed. Thermal well design optimization for the Life of the Well include topics such as:

- **Presentation 1:** Driving Wellhead Efficiencies through Team Collaboration
  Dean Piquette, Wood Group
- **Presentation 2:** Application of Vacuum-Insulated Tubing (VIT) in Thermal Oil Sand Projects
  Mirko Zatka, Canadian Natural Resources Ltd.
- **Presentation 3:** Vacuum Insulated Coil Tubing (VICT)
  Darren Johannson, Majus Canada Ltd.

1030-1100 | Coffee Break Sponsored by: DELTA™ SCREENS

1100-1230 | Session 2: Artificial Lift Strategies

Session Chairs: **Blair Neil**, Exceed Oilfield Equipment
Adam Welty, Armour Valve

This session will focus on thermal artificial lift strategies and the on-going studies to improve production.

- **Presentation 1:** Using Improved Engineering Models, Field Monitoring and Data Analytics to Optimize ESP Utilization
  Todd Zahacy, C-FER Technologies
- **Presentation 2:** Considerations and Challenges for Artificial Lift in SAGD Environments
  Leon Waldner, Nexen Energy ULC
- **Presentation 3:** Advancements in Rigless Coiled Tubing ESP Deployment
  Clint Jones, Petrospec

1230-1330 | Networking Lunch and Keynote:
CSA Standards – The Development Process and Application
Sophia Chan, CSA Group and Isaac Khallad

Lunch Sponsored by: HUNTING

Drilling Track

1330-1500 | Session 3: Cement Operations and Technology

Session Chairs: **Bryan Hnatiuk, Decades Upstream Consulting Services Ltd.**
Jaleh Zadeh

This session will examine developments and advancements in understanding and design of cement properties for Thermal applications to optimize the cement integrity. A quality primary cement job in thermal wells exposed to multiple thermal cycles is critical for casing support, zonal isolation, mitigation of gas/fluid migration, and general long term well integrity.

- **Presentation 1:** Using Foam Cement in Areas of Major Losses to Reduce Risk of Cap Rock Integrity in the Oil Sands
  Troy Abs, Suncor Energy
- **Presentation 2:** Collaborative Approaches to Improving Cement Design for Thermal Wells
  Trent Kaiser, Noetic Engineering
- **Presentation 3:** Cement Design Properties and the Effects of Enhanced Hydration Prior to Cement Placement
  Kelly Soucy, Magnum Cementing Services

1500-1530 | Coffee Break Sponsored by: DELTA SCREENS

1530-1700 | Session 4: Thermal Well Construction - Casing and Liners

Session Chairs: **Doug Hollies, Codeco Oilsands Engineering**
JP Martin, Tenaris

Understanding the mechanical limits of casing and liners is critically important for drilling engineers during installing and cementing operations. The effect of these installation loads on the structural stability of casing and liner in thermal applications has been mostly theoretical to this point. In this session, we look to open the door on some thermal testing to failure and installation load envelop management, which will provide valuable insight for your thermal well design.

- **Presentation 1:** Selection and Installation of Casing Connections for SAGD Wells
  Terry Marion
- **Presentation 2:** Installing Liners Safely and Quickly Using Dynamic Surface Load Limits
  Spencer Taubner, Noetic Engineering
- **Presentation 3:** Casing Connection Challenges - Fatigue and Over Torque
  Jonathan Olsen, Tenaris

Completions Track

1300-1500 | Session 3: Workovers

Session Chairs: **Colby Sutton, RGL Reservoir Management**
Pat Webb, Devon Energy

This topic will focus on thermal workovers; their problems and solutions.

- **Presentation 1:** Intermediate Casing Failures: Diagnosis, and Repair Strategies
  Pat Webb, Devon Energy
- **Presentation 2:** Optimizing Underperforming Horizontal Producers
  Tim Gorham, Chevron
- **Presentation 3:** Regaining Control of Blowouts from Thermal Wells
  Dwight Bulloch, Capstone

1500-1530 | Coffee Break Sponsored by: DELTA SCREENS

1530-1700 | Session 4: Completions: Design and New Technologies

Session Chairs: **Matt Crockett, Suncor Energy**
Jonathan Heseltine, C-FER Technologies

Emerging technologies have the potential to improve operational efficiencies and cost competitiveness throughout the thermal well lifespan. This session will focus on innovative technologies and designs that benefit wellbore diagnostics, remediation, resource recovery, completions and workover operations.

- **Presentation 1:** Downhole Heating - A New and Robust Re-Creation of a Proven but Ignored Technology
  J.M. Karanikas, Salamander Solutions/Shell
- **Presentation 2:** Optimized Fluid Placement for Matrix Stimulation
  Armando Sanchez, Wavefront
- **Presentation 3:** New High Temperature Casing Patch Installations
  Blair Temple, Imperial Oil

1700-1800 | Networking Reception

Sponsored by: DELTA SCREENS

SPE Workshop: Enhancing Life Cycle Costs of Thermal Wells Through Drilling and Completions

WEDNESDAY, 14 JUNE

0700-0800 | Registration and Breakfast

Combined Drilling and Completions Track

0800-0930 | **Session 5: Re-Entries and Re-Drills**

Session Chairs: Matt Crockett, Suncor Energy
Blair Stengler, Devon Energy

Industry experts present and discuss the best practices for either re-entering or re-drilling under-performing thermal wells.

- Completions – casing assessment and preparation for re-entry
- Re-Drilling Operations - liner removal, sidetracking and whipstocking
- Recompletions - what techniques and technologies are available to return the wells to service

- **Presentation 1:** Thermal Well Assessment and Preparation for Re-Entry
  Rick Stahl, Northern Blizzard
- **Presentation 2:** Re-drills
  Vince Boucher, Suncor Energy
- **Presentation 3:** Drilling SAGD Wells...Now vs Then: A Directional Perspective
  Ryan Quigg, Weatherford
- **Panel Discussion:** Comparing Re-drills and Re-entry
  Moderator: Marius Bordieanu, Suncor Energy

0930-1000 | Coffee Break Sponsored by: DELTA™ SCREENS

1000-1130 | **Session 6: New Thermal Production Systems**

Session Chairs: Stephen Lai, Pason Systems
Mitchel Stretch, Schlumberger

Steam is not the only way to stimulate or produce a heavy oil or bitumen reservoir. There are a variety of additives and processes that are being used to enhance production that may alter the sub-surface operating conditions that define our current well structures. Solvent enhancement of the steam through processes like NSolv, SAP, ES-SAGD, SA-SAGD, LASER are either in service or getting very close to commercial development. More non-steam stimulation systems like VAPEX, THAI, ET-DSP, and ESEIEH are other processes that look to change the oil in the reservoir and allow production at much lower temperatures. How will these processes affect our modern well designs, completion systems and workover routines?

- **Presentation 1:** Multi-Lateral Technology Advances in Thermal Applications
  Gary Gill, Consultant

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- **Presentation 2:** Radio Frequency Reservoir Heating (ESEIEH)
  Shirish Deshpande, Suncor Energy and **Derik Ehresman**, Harris Corporation
- **Presentation 3:** The Carbon Cost: How Carbon Taxes Could Affect In-Situ Economics
  Jared Wynveen, McDaniel & Associates

1130-1300 | Networking Lunch
Sponsored by: Weatherford

1300-1430 | Session 7: Operational Project Execution Efficiencies

Session Chairs: **Jeff Arvidson**, Devon Energy
Gregori Colomine, Nexen Energy ULC

Operational efficiency for Drilling and Completions in Major Projects is essential for profitability and affects the payout of each individual development phase. Come and learn what various companies are doing to decrease their cost through operations efficiency and organization of their work flow. Could you adopt any of these in your project?

- **Presentation 1:** Integrated Wellpad Consolidation – Using Single and Dual Parallel Rows of Wells
  Ashley Leroux, iTS
- **Presentation 2:** New Thermal Wellhead that Provides Dual Barrier Protection and Eliminates Welding
  Ryan Miller, Nexen Energy ULC
- **Presentation 3:** Moving with the Times
  Kirk Parker, Akita Drilling

1430-1500 | Coffee Break Sponsored by: DELTA SCREENS

1500-1630 | Session 8: Production Optimization

Session Chairs: **Colby Sutton**, RGL Reservoir Management
Gina Wozney, GRW Consulting Ltd.

The ability to produce thermal wells effectively has many different aspects to it and each area will play a part in making In-situ Oilsands projects successful. Various technologies like flow control devices, sand control systems, artificial lift types and insulated tubing/ casing systems are being used differently in many different thermal development fields. How these systems are used will define the ultimate profitability of the projects.

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- **Presentation 1:** Wellbore Simulation for Production Optimization
  Raj Bal, Madala Software
- **Presentation 2:** Sand Control Design and Evaluation Experiments for Optimal Thermal Production
  Mahdi Mahmoudi, RGL Reservoir Management
- **Presentation 3:** Optimizing the Long-Term Economics of High Curvature ESP-Lifted Wells using ESP Reliability Data
  John Graham, Suncor Energy and Craig Radke, C-FER Technologies

Please provide your feedback about this workshop by answering 5 short survey questions:
www.spe.org/go/SPEaca217

SPE Canadian Educational Foundation

Did you Know...

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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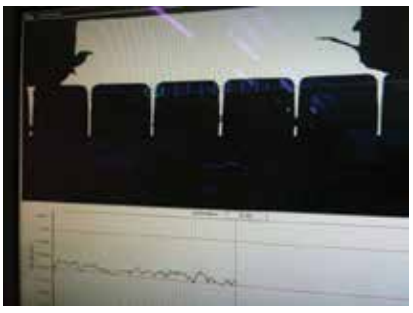

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NOTES:

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Upcoming SPE Canada Events and Training

Events

SPE Workshop: Production Forecasting for Heavy Oil and Unconventional Resources
26–27 Sep 2017 | Calgary, Alberta

SPE Workshop: The Duvernay Liquids Rich Shale - What Makes it Different and How Do We Optimize It?
18 Oct 2017 | Calgary, Alberta

SPE Workshop: Well Integrity Life Cycle Management for Subsea Field Development
24–25 Oct 2017 | St. John's, Newfoundland

SPE Workshop: Unlocking the Montney, Success Through Change
7–8 Nov 2017 | Calgary, Alberta

SPE Thermal Well Integrity and Design Symposium
28–30 Nov 2017 | Banff, Alberta

SPE Canada Co-located Unconventional Resources and Heavy Oil Technical Conference & Exhibition
13–14 Mar 2018 | Calgary, Alberta

Training Courses

Fracturing Fundamentals for Non-Fracers – Instructor: Carl Mongomery
19 Jun 2017 | St Johns, Newfoundland

Evaluation of Canadian Oil and Gas Properties
19–23 Jun 2017 | Spoule Academy, Calgary, Alberta

Evaluation of Canadian Oil and Gas Properties
11–15 Sep 2017 | Sproule Academy, Calgary, Alberta

Toe-to-Heel Air Injection (THAI) - A Promising In-Situ Combustion Emerging Technology Instructor: Alex Turta
15 Sep 2017 | Calgary, Alberta, Canada

Evaluation of Canadian Oil and Gas Properties
23–27 Oct 2017 | Sproule Academy, Calgary, Alberta

Unconventional Resource Assessment and Valuation – Instructor: James Gouveia
30 Oct–3 Nov 2017 | Calgary, Alberta, Canada

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