



Society of Petroleum Engineers
First Floor, Threeways House
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Preview

SPE INTERNATIONAL

Oilfield Scale

CONFERENCE AND EXHIBITION
11-12 May 2016 | Aberdeen, UK | www.spe.org/events/oss

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Society of Petroleum Engineers

Event Focus

Despite our ever-increasing understanding of the prediction, formation, prevention, and removal of scale, more extreme challenges for the oil and gas industry continue to emerge. The requirements associated with extreme temperatures and pressures, new techniques such as EOR, and the growth in shale gas production are all examples worthy of note. However, in today's business climate, the increased focus on risk versus reward forces our profession to extend the boundaries of knowledge, whilst reducing associated costs. Therein sits our ongoing conundrum.

Now held every two years along with a workshop during alternate years, the event offers an unrivalled opportunity for you to share your scale expertise, from the latest research into fundamental principles to cutting-edge developments through your hands-on experience of the field.

Who Should Attend

- Academics and students
- Chemical vendors and manufacturers
- Consultants
- Process and project engineers
- Production chemists and engineers
- Researchers and scientists

Topics Covered

- Case Histories
- Innovative Solutions to Scale Control
- Emerging Chemistries and Technologies
- Unconventional Scale and Scale Removal
- Unconventional Production

Schedule of Events (as of January 2016)

Monday 9 and Tuesday 10 May 2016

Formation and Prevention of Oilfield Scale: From the Laboratory to the Field Training Course

Wednesday, 11 May 2016

0830–0900	Keynote Speech: Design and Performance of Novel Sulphide Nanoparticle Scale Inhibitors for TOTAL's North Sea HP/HT Fields
0900–1030	Case Studies 1
1030–1100	Coffee Break and Poster Session
1100–1230	Emerging Chemistries and Technologies (squeeze related)
1230–1330	Lunch and Poster Session
1330–1500	Innovative Solutions to Scale Control 1
1500–1530	Coffee Break and Poster Session
1530–1700	Unconventional Scale and Scale Removal

Thursday, 12 May 2016

0830–0900	Keynote Speech: Time-Resolved Fluorescence for Real-Time Monitoring of both Scale and Corrosion Inhibitors: a Game-Changing Technique
0900–1030	Emerging Chemistries and Technologies (monitoring, predictions, effects of turbulence)
1030–1100	Coffee Break and Poster Session
1100–1230	Innovative Solutions to Scale Control 2 (prediction and modelling)
1230–1330	Lunch and Poster Session
1330–1500	Case Histories 2
1500–1530	Coffee Break and Poster Session
1530–1630	Unconventional Production

Programme Committee

Gill Ross

Shell UK Ltd

Programme Chair
Mohsen Achour

ConocoPhillips Co

Dr. Hamad Al-Saiari

Saudi Aramco

Dr. Salima Baraka-Lokmane

Total

Maria Carmen Moreira Bezerra

Petrobras

Stuart Brice

Maersk Oil

Ping Chen

Halliburton

Stephanie Edmunds

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Hua Guan

OneSubsea

Stephen Heath

Baker Hughes

Michael Jensen

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Myles Jordan

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Amy T. Kan

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Scaled Solutions Ltd.

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Alistair Strachan

Nalco Champion

Wei Wei

Chevron

Helen Williams

Nalco Champion

Nicole Williamson

BP

Dr. Jonathan Wylde

Clariant Oil Services

Ying Xu

Conocophillips

Welcome From the Chair

On behalf of the Society of Petroleum Engineers (SPE) and the Programme Committee, it gives me great pleasure in welcoming all delegates to this, the 13th SPE International Conference and Exhibition on Oilfield Scale. The event has a reputation for being the leading global event pertaining to scale. It offers an unrivalled opportunity to share scale expertise, from the latest research into fundamental principles onwards to cutting edge developments through your hands on experience of the field. I would like to thank and acknowledge all authors who submitted proposals to the conference. There was, yet again, a record number of abstracts submitted which made selection of papers and posters particularly challenging and has led to a rich and exciting programme of presentations. To the authors and presenters I wish to extend my congratulations and gratitude for helping to make this event a success.

Scale continues to be a significant worldwide challenge for oilfield production and process systems. Despite our ever increasing understanding of the prediction, formation, prevention and removal of scale, more extreme challenges for the oil and gas industry continue to emerge. The requirements associated with extreme temperatures and pressures, new techniques such as EOR and the growth in shale gas production are all examples worthy of note. However, in today's business climate, the increased focus on risk versus reward forces our profession to extend the boundaries of knowledge, whilst reducing associated costs. Therein sits our on going conundrum.

Now held every two years along with a workshop during alternate years, the event offers an unrivalled opportunity to share your scale expertise, from the latest research into fundamental principles onwards to cutting edge developments through your hands on experience of the field.

We look forward to meeting you in Aberdeen in May 2016.


Gill Ross

Shell U.K. Ltd

Sponsors (as of February 2016)

Conference Programme and
Exhibition Guide Sponsor



Digital Proceedings Sponsor



Sponsorship/Exhibiting Opportunities

Sponsorship and exhibiting at this prestigious industry gathering provide an excellent opportunity to gain maximum exposure to delegates from the oilfield scale community who will be looking to short-list potential suppliers and consultants for their own projects. As well as being a great promotional opportunity, sponsorship and exhibiting are essential to the work of the SPE to help us cover costs and keep the delegate fee low.

Sponsorship

The following sponsorship options are currently available at this event to enable you to maximise your presence in the industry and strengthen brand identity:

AV Equipment
Conference Programme
Welcome Reception
Conference Bags

Lanyards
Conference Lunches
Welcome Dinner

Exhibiting

A limited number of exhibition spaces are available at the event. The exhibition will be located next to registration and in the area where teas, coffees, lunches and the Knowledge Sharing poster sessions will take place.

A 15% discount applies to sponsors and exhibitors at both the SPE Scale Conference AND the SPE Corrosion Conference.

Please contact us to find out more about the options available.

Dean Guest

Sales Manager-Events, Europe
Tel + 44 (0) 20 7299 3300
Email: dguest@spe.org

Conference Programme (as of February 2016)

Wednesday 11 May



0830-0900

Keynote Address: Dr. Salima Baraka-Lokmane Design and Performance of Novel Sulphide Nanoparticle Scale Inhibitors for TOTAL's North Sea HP/HT Fields

Production of extreme-HPHT formation water in the North Sea fields has created unprecedented scaling challenges. A good producer well has been shut-in since 2011 due to exotic sulphide scaling rendering the subsurface safety valve inoperable. Commercially available scale inhibitors have proven incapable of performing under the harsh conditions of the reservoirs: high temperature (200-225 °C), high pressure (1,100 barg) and high salinity (>250 g/L Total Dissolved Solids). It was therefore crucial to pioneer novel chemical treatments. An important R&D program was launched to understand the mechanisms of sulphide scale formation and to develop new scale inhibitors effective for these scales in extreme-HPHT conditions. A novel sulphide nanoparticle scale inhibitor was developed to inhibit zinc and lead sulphide scales and remain stable under the harsh conditions of CGA reservoirs. The new chemical was qualified in France and Scotland using state-of-the-art test methodologies.

0900-1030

Case Studies 1

Session Chairs: Eric Mackay, Heriot Watt University and **Nicole Williamson**, BP

Publication of case histories provides a vital opportunity for the industry to learn from realised and from missed opportunities. The first paper discusses BaSO₄ removal and subsequent inhibition in two subsea wells with commingled flow, which despite logistical challenges were successfully treated. The second looks back over ten years of evolving scale management in a field with 25 wells, compares observed data with those predicted prior to field start up, and concludes with what could have been done better. The third paper presents a state of the art review of scale inhibitor analysis techniques, and describes how these techniques are used to provide cost effective scale management.

Conference Programme (as of February 2016)

1100-1230

Emerging Chemistries and Technologies (squeeze related)

Session Chairs: Eyvind Sørhaug, Repsol and Jonathan Wylde, Clariant Oil Services

This session focuses on squeeze related innovation both in the chemistry and in our understanding of the squeeze process. Papers will focus on the understanding of precipitation squeeze chemistry and in particular the solubility of these complexes in this process. The session goes on to cover application methodology and in particular squeeze placement in the challenging scenario of subsea multi-lateral wells. The session concludes with a case history from the Norwegian sector of the North Sea where squeeze application was particularly challenging and was overcome using innovative techniques and chemistry.

1330-1500

Innovative Solutions to Scale Control 1

Session Chairs: Salima Baraka-Lokmane, Total and Ping Chen, Halliburton

Current solutions and technologies used for scale control present many challenges, these require innovative solutions. Papers in this section cover a wide range of chemical and physical innovative solutions for a cost-effective scale management. Three presenting papers focused on the different approaches and scale types such as (i) silica and silicate scale formation and inhibition; (ii) assessing surface engineering solutions for oilfield scale; Correlating Laboratory Tests to Field Trials and (iii) Non-chemical methods for downhole sulphate scale Control. Of all three alternate papers one presents a novel chemical for iron sulfide growth inhibition and dispersion and other two discussed the impact of vapour-liquid equilibria (VLE) Calculations on scale prediction modelling as well as brine mixing in layered reservoirs; prediction and impact on scaling risks in EOR.

1530-1700

Unconventional Scale and Scale Removal

Session Chairs: Olav Selle, Statoil and Stephen Heath, Baker Hughes

The focus of this session will be on both practical experiences and theoretical studies on unconventional sulphide and halite scale deposition and control. The session will include geochemical modelling, factors contributing to exotic scale deposition coupled with new test method developments and details of new additives and dissolvers for exotic scale inhibition and removal.

Conference Programme (as of February 2016)

Thursday 12 May



0830-0900

Keynote Address: Dr. Matteo Martini

Time-Resolved Fluorescence for Real-Time Monitoring of both Scale and Corrosion Inhibitors: a Game-Changing Technique

Time-resolved fluorescence (TRF) technique has been applied for the quantification of both scale and corrosion inhibitors in Elgin and Perpetua brine production waters. Revealing solution containing Eu^{3+} and Tb^{3+} ions has been added to the test sample and analysed by portable field TRF detector (INIBOX). The specific interaction between lanthanide ions and chelating species of inhibitors gives a TRF signal proportional to the concentration of additives. Double quantification of scale-scale or scale-corrosion inhibitors in brine producing waters were studied and data reported. The 2-minute measurements as well the sub-ppm sensitivity of technique open perspectives for any further real-time online chemicals management in offshore facilities.

0900-1030

Emerging chemistries and technologies (monitoring, predictions, effects of turbulence)

Session Chairs: Hua Guan, OneSubsea and Helen Williams, Nalco Champion

New, emerging technologies are essential in today's climate, to tackle scale issues under harsher environments, allowing testing to be done under realistic conditions, and to look at more cost effective treatment methods. The growth of deepwater and high temperature high pressure production areas, the increased understanding of the effects of turbulence and iron on scale formation and treatment has led to new test methodologies and improved scale prediction models being developed; and a need for new chemistries to enhance scale squeeze treatment lifetime under harsher conditions. Furthermore, the drive to reduce costs has led to new technologies being developed to allow more cost effective solutions to be provided.

1100-1230

Innovative Solutions to Scale Control 2

Session Chairs: Alistair Strachan, Nalco Champion and Wei Wei, Chevron

When oil and gas production moves into HPHT environments or improved/enhanced oil recovery techniques are required (such as CO₂ Water Alternating Gas, Alkali Surfactant Polymer), the industry needs great understanding of

Training Course

Monday 9 and Tuesday 10 May 2016

Course Title: Formation and Prevention of Oilfield Scale: From the Laboratory to the Field

Description

This one day course introduces state of the art oilfield scale management, with field examples to illustrate the basic science. Participants have the opportunity to run Heriot-Watt's SQUEEZE software to create field-scale inhibitor squeeze designs. The course material draws on the research and industry experience of the presenters. It provides both the underlying theory in an accessible manner and examples of how to apply that knowledge in the field.

Learning Objectives

To have good understanding of the science of oilfield scale and how this is avoided or managed in the field. This will include studying scale formation, problem diagnosis and preventive technologies.

Who Should Attend

This course is for production technologists, engineers, oilfield chemists and anyone concerned with flow assurance issues. It is also useful for those who work in the service, scale inhibitor and sulphate removal industries.

CEU Units: 1.6

Instructors

Eric Mackay is a Professor at the Heriot-Watt University Institute of Petroleum Engineering, where his research interests include the application of Reservoir Engineering principles and data to better understand production issues. For over 15 years he has worked on oilfield scale, developing and applying flow models to predict scale precipitation and to design squeeze treatments. He has over 100 publications related to scale management. In 2004 he was invited to make a keynote presentation at the SPE 6th International Symposium on Oilfield Scale, and was Programme Committee Chair for the 2006 Symposium. Eric was an SPE Distinguished Lecturer on the topic of Oilfield Scale during 2007-08. He has prepared and co-presented SPE short courses on Oilfield Scale and is a Technical Editor for SPE Production and Facilities. As well as being responsible for software development, support and training within the Flow Assurance and Scale JIP at Heriot-Watt University, Eric has carried out both theoretical and field applied studies with many of the operating and service companies that support the JIP. In addition to having led over 40 industrial training sessions in the use of software for oilfield scale management, Eric has taught practical Reservoir Simulation to the residential and distance

scale formation mechanism, kinetics and also requires accurate scale prediction models. Often, the environment associated with such production makes the prediction more complex and challenging. For example, WAG process is associated with the cycle of deposition of CaCO₃ scaling in production wells with the change of water chemistry and pH; The "exotic scales" such as sulphide Scales (FeS, ZnS, and PbS) have become more common but high quality experimental observations were lacking; high-pressure/high-temperature (HP/HT) wells also demands accurate understanding of brine chemistries and kinetic effect from pressure. Papers in this section focus on providing such innovative solutions by using modeling or advanced experimental approach for scale prediction in complex and extreme conditions.

1330-1500

Case Histories

Session Chairs: Myles Jordan, Nalco Champion and Gill Ross, Shell

Publication of case histories are a crucial way in which the industry can learn, not only from success but also from challenges experience during operations. This session highlights powerful case histories that focus on challenges of assessing if heavy metals (zinc and lead) within samples from HT/HP field samples are they in fact real or erroneous, the origin and impact of high sulphate levels in production water can have on scale management strategy and the challenge of calcium sulphate scale formation/control within steam flood operations. This well rounded set of case-histories will prove valuable to many disciplines concerned with scale formation and follow the theme set out in Case study session 1.

1530-1630

Unconventional Production

Session Chairs: Stuart Brice, Maersk Oil and Haiping Lu, Baker Hughes

With the increasing demand for fossil fuels and rapid depletion of conventional oil and gas resources, the exploration and development of unconventional oil and gas have been driven which brings new challenges on scale control and management. Shale oil and gas are one of important unconventional resources, and the hydraulic fracturing during shale oil and gas production demands new strategies for scale predictions, modeling, and inhibition. The high salinity brines, usually having halite scale and other scales, could be one of troublesome problems during the production, and the squeeze application for fractured reservoirs needs different modeling from those for conventional wells. The addition of heavy metals and boron in fracturing fluid systems will also cause complications on scale control. Finally, a case history about the scale inhibitor retention on the ultra-low temperature sandstone reservoirs will also be presented in this session.

learning MSc classes at the Institute of Petroleum Engineering at Heriot-Watt since 1990. Eric holds a BSc in Physics from the University of Edinburgh and a PhD in Petroleum Engineering from Heriot-Watt University.

Ken Sorbie is a Professor in the Institute of Petroleum Engineering at Heriot-Watt University. He has a first degree in Chemistry from Strathclyde University and a DPhil in Theoretical Chemistry/Applied Mathematics from the University of Sussex. Following this, he did a postdoc at Cambridge University working on theoretical aspects of semi-classical molecular quantum theory. He has worked in oil related research for over 20 years, firstly with the Department of Energy laboratory at AEE Winfrith where he led a group working on improved oil recovery, flow through porous media and reservoir simulation and, since 1988, at Heriot-Watt U. His current research is in oilfield chemistry and he is PI (along with Professor Anne Neville and Eric Mackay) of the Flow Assurance and Scale Team (FAST) joint industry project (JIP). This 3 year, £2million FAST project is sponsored by an industrial consortium of 22 companies and was first launched as a JIP by Ken in 1989. Ken also has three other projects on multiphase flow in porous media and on near well water control treatments, funded by 12 industrial companies. He has published over 200 technical papers on his research (which are all downloadable in pdf format from www.pet.hw.ac.uk) and a book on polymer flooding. Ken has also consulted widely in the oil industry for over 30 industrial companies and is a regular visitor to Companies and Research Institutes in Brazil, Malaysia, Russia, Italy, Norway and the US. He has been invited to be a Visiting Professor at the University of Bergen. He was a Society of Petroleum Engineering (SPE) Distinguished Lecturer in 2000–2001 and is a member of the Royal Society of Edinburgh. Ken has been awarded the Society of Core Analysts (SCA) 2004 Technical Achievement award.

Training Course Prices

Member: 600 GBP

Non Member: 700 GBP

Fees include: coffee breaks, lunches and training course material

General Information

To register, please visit the SPE events page at www.spe.org/events/oss/2016/ where you can also download or print a PDF version of the registration form.

SPE accepts Visa and MasterCard credit cards. If you have any questions, please contact the SPE London office:

SPE Europe, Russia, Caspian and Sub-Saharan Africa Office

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Conference Venue Aberdeen Exhibition and Conference Centre (AECC)

Bridge of Don, Aberdeen, AB23 8BL
Tel: +44.1224.824824

Posters

A variety of poster presentations will be displayed during the course of the conference. We would encourage all delegates to take a moment during the session breaks to view these posters covering a range of related subjects.

Digital Proceedings

One copy of the digital proceedings will be provided for all registrants (excluding students). Additional copies can be purchased from the registration desk: GBP 50 for members and GBP 75 for nonmembers.

Audio Visual Copyright

SPE technical sessions are protected by copyright laws. Attendees are not permitted to record (via phone, camera, or any other recording device) the presentations made during this conference.

Accommodation

Reservations can now be made for the 2016 SPE International Scale and Corrosion Conference and Exhibition through the hotel booking website. Through this website you can book, modify or cancel your hotel reservations at any time.

<https://aws.passkey.com/event/14496460/owner/10333605/home>

Conference Dinner

Following the drinks reception on Wednesday, 11 May, there will be a conference dinner which will begin at 1930. This reception and dinner provides an ample opportunity for networking with other delegates. Both the reception and dinner are included in the conference fee. Please indicate in your registration process whether you wish to attend.

Getting There

The Aberdeen Exhibition and Conference Centre (AECC) is situated 10 minutes from Aberdeen city centre. Aberdeen International Airport is a short drive away and has frequent connections to London/UK airports and good service to northern European destinations. The Aberdeen railway station is also a short drive from AECC and connects to all main UK stations.

Badge Collection

Event badges and materials will not be mailed in advance. Your event badge and registration materials (including a copy of the digital proceedings) should be collected from the registration desk on Wednesday, 11 May at 0730–0830. The registration desk will be open throughout the event for any event and/or registration enquiries.

Registration Fees

All fees shown below are in pounds (GBP) and subject to 20% local tax.
Prices exclude accommodation.

Registration Fees for SPE International Scale Conference and Exhibition	
Full Conference	Excluding Tax
SPE Member	GBP 550
Nonmember	GBP 635
Author/Speaker/Committee/Session Chair	GBP 525
SPE Student Member	GBP 290
Student Nonmember	GBP 290
SPE Training Course: Formation and Prevention of Oilfield Scale: From the Laboratory to the Field	
SPE Member	GBP 600
Nonmember	GBP 700
JOINT SPE International Oilfield Corrosion and Scale Conferences and Exhibitions	
SPE Member	GBP 990
Nonmember	GBP 1143
SPE Student Member	GBP 522
Student Nonmember	GBP 522
<p>Delegate Registration Fee The registration fee includes: entry to all conference sessions, entry to the exhibition; access to all poster displays, a copy of the conference digital proceedings, coffee break refreshments and lunches, and attendance at the reception and dinner on 11 May.</p> <p>The JOINT registration fee includes entry to both Oilfield Corrosion and Scale exhibitions, conferences, poster sessions, coffee breaks, lunches, conference dinners (on 9 and 11 May) and Oilfield Corrosion workshops. Joint registrants will also receive a copy of the Oilfield Corrosion and Scale digital conference proceedings.</p> <p>Refunds Cancellations must be submitted in writing to the SPE office in London before 21 March in order for you to receive a refund. Cancellations prior to 21 March will receive a refund less a GBP 50 handling fee. Cancellations received on or between 21 March and 18 April inclusive, will receive a 50% refund. For cancellations after 18 April, no refunds will be paid although substitutions may be made.</p> <p>Visa information Attendees from countries that require a UK visa for entry are reminded that the process of obtaining a visa may take several months.</p> <p>Please contact FormsLondon@spe.org for a visa invitation letter you can use in obtaining a visa. Please note that this letter does not guarantee that you will be granted a visa, nor does it commit SPE to assist you in obtaining a visa.</p> <p>Badge Pickup Badges will be available for pick up on-site at the registration desk.</p> <p>Questions? If you have any questions, please contact FormsLondon@spe.org or +44(0) 20 7299 3300.</p>	



SPE INTERNATIONAL Oilfield Corrosion CONFERENCE AND EXHIBITION

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Reducing Corrosion Risks and Costs: Mission Impossible?



Society of Petroleum Engineers