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
- **1530–1630** Unconventional Production

**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
Solvay UK Ltd

Hua Guan
OneSubsea

Stephen Heath
Baker Hughes

Michael Jensen
Hess

Myles Jordan
Nalco Champion

Amy T. Kan
Rice University

Haiping Lu
Baker Hughes

Eric Mackay
Heriot-Watt University

Dr. Eugenia Marinou
LR-Senergy

Ross McCartney
Oilfield Water Services Ltd

Anne Neville
University of Leeds

Olav Selle
Statoil

Caroline Simpson
Scaled Solutions Ltd.

Eyvind Sørhaug
Repsol Exploration Norge AS

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
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.

Sponsors (as of February 2016)

Conference Programme and Exhibition Guide Sponsor

Digital Proceedings Sponsor

Statoil

NALCO Champion

An Ecolab Company

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
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 Eu³⁺ and Tb³⁺ 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...
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 form 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**
  - 1st Floor, Threeways House
  - 40/44 Clipstone Street
  - London, W1W 5DW, UK
  - Tel.: +44.20.7299.3300
  - Fax: +44.20.7299.3309
  - Email: reglondon@spe.org

**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 19:30. 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 07:30–08:30. The registration desk will be open throughout the event for any event and/or registration enquires.
## 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

<table>
<thead>
<tr>
<th></th>
<th>Excluding Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full Conference</strong></td>
<td></td>
</tr>
<tr>
<td>SPE Member</td>
<td>GBP 550</td>
</tr>
<tr>
<td>Nonmember</td>
<td>GBP 635</td>
</tr>
<tr>
<td>Author/Member/Committee/Session Chair</td>
<td>GBP 525</td>
</tr>
<tr>
<td>SPE Student Member</td>
<td>GBP 290</td>
</tr>
<tr>
<td>Student Nonmember</td>
<td>GBP 290</td>
</tr>
</tbody>
</table>

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SPE Member</td>
<td>GBP 600</td>
</tr>
<tr>
<td>Nonmember</td>
<td>GBP 700</td>
</tr>
</tbody>
</table>

| SPE Member | GBP 990 |
| Nonmember | GBP 1143 |

### JOINT SPE International Oilfield Corrosion and Scale Conferences and Exhibitions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SPE Member</td>
<td>GBP 522</td>
</tr>
<tr>
<td>Nonmember</td>
<td>GBP 522</td>
</tr>
</tbody>
</table>

### 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.

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.

### 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.

### 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.

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.

### Badge Pickup

Badges will be available for pick up on-site at the registration desk.

### Questions?

If you have any questions, please contact FormsLondon@spe.org or +44(0) 20 7299 3300.