



Gas Hydrate Challenges in the Oil and Gas Industry

**>>Registration deadline:
18 December 2008**

**>>Register by fax, email or
online at www.spe.org/atws**



Steering Committee

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(Co-Chairman)
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Technology

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(Co-Chairman)
BG Group

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Nalco Energy Chemicals

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Schlumberger

Workshop Abstract

Gas hydrate related flow assurance problems are an increasingly recognised cause of production losses in some gas and oil fields, particularly in deepwater, long tieback fields. Where they do exist, the consequences on production (revenue), safety and environmental impacts can be extreme. Related to the mitigation of gas hydrates are other treatment influences such as scaling and corrosion inhibition, which can have a major impact on the performance of oilfield facilities.

Much research and development work is ongoing in the academic, operator and service company research facilities to understand all aspects of hydrate formation and mitigation. Much of the focus on mitigation is with chemically based treatments which range from high concentrations of recoverable thermodynamic inhibitors to "once-through" Low Dosage Hydrate Inhibitors (LDHI). Recovery and regeneration of thermodynamic inhibitors, such as MonoEthyleneGlycol, presents its own set of unique problems.

Work to predict the risk of hydrate formation in Greenfield Developments is gathering a pace and several operators are using new prediction programmes in risk-based evaluations of hydrate management and system design. Chemicals are not the only mitigation and remediation techniques being used or considered, "cold flow" electrical heating and coiled-tubing are amongst the technologies being studied.

Workshop Objectives

This workshop has the objective of bringing together a range of industry professionals into an environment where they can brainstorm, troubleshoot and discuss the fundamental understanding of all aspects of hydrate management. Part of the workshop will be discussions on hydrate management, including impact of facilities design, application of treatment chemicals and the use of novel methods to control hydrate problems. The use of hydrate in transportation and problems in drilling will also be explored during one session. Discussions based on actual case histories will be encouraged and will be integral to these latter debates, which will give all attendees a broad background in all matters pertaining to hydrates and their management.

Who Should Attend

The workshop is designed for those in the oil and gas industry who are interested in the latest knowledge within the area of hydrate management, and related transportation issues. Delegates are expected to actively participate and contribute to discussions. The workshop is aimed at the following professionals and academics:

- Production Chemists
- Production Engineers/Production Technologists
- Petroleum and Reservoir Engineers
- Hydrate Management Researchers
- Facilities Engineers
- Flow Assurance Specialists
- Completions/Workover/Drilling Engineers
- Well Engineers
- Managers
- Transportation and Logistics Specialists
- HSSE Specialists

General Information

Format:

Welcome Reception & Dinner followed by 3 days of informal discussions prompted by selected keynote presentations and discussions. Attendees will be assigned to discussion groups on a random basis for the breakout session on the second day to maximise the opportunity to interact with other participants.

Poster Sessions:

The Steering Committee encourages registrations from professionals who are able to prepare and present a poster on a relevant project. Details of the poster size and facilities will be provided in the joining instructions.

Attendance:

Registrations will be accepted on a first-come first-served basis. The Steering Committee encourages attendance from those who can contribute to the workshop most effectively either in discussions or with posters. A mix of attendees in terms of geographic origin, companies and discipline will be encouraged.

Documentation:

- Proceedings will not be published; therefore, formal papers and handouts are not expected from speakers.
- Work in progress, new ideas and interesting projects are sought.
- Professionally-prepared visual aids are not required; handwritten view graphs are entirely acceptable.
- Note-taking by participants is encouraged. However, to ensure free and open discussions, no formal records will be kept.

Workshop Deliverables:

- The Steering Committee will appoint a "scribe" to record the discussions and to produce the full Workshop Report for SPE.
- This report will be circulated to all attendees as the Workshop deliverable within 4-6 weeks following the Workshop. The copyright of the report is with SPE.
- PowerPoint presentation materials will be posted on a specific SPE URL address after the Workshop. Provision of the materials by the discussion leaders will signify their permission for SPE to do so.

Commercialism:

In keeping with ATW objectives and the SPE mission, excessive commercialism in posters or presentations will not be permitted. Company logos must be limited to the title slide and used only to indicate the affiliation of the presenter and others involved in the work.

Attendance Certificate:

All attendees will receive an attendance certificate attesting to their participation in the workshop. This certificate will be provided in exchange for a completed Workshop Questionnaire.

Continuing Education Units:

Attendees at this workshop qualify for SPE Continuing Education Units (CEU) at the rate of 0.1 CEU per hour of the Workshop.

Registration Information:

The registration fee is **USD 1,850** for **SPE members** and **USD 1,950** for **non-members**.

The fee includes the following:

- All workshop sessions
- Welcome reception followed by dinner on Sunday, 18 January 2009
- Daily coffee breaks and luncheons
- Workshop Workbook and Certificate of Continuing Education Units (CEU)

Note: Accommodation is NOT included in the workshop registration fee. Lodging space is limited, so you are encouraged to place your reservation early. Each registrant will receive housing information once they register for the workshop. SPE has negotiated a special discounted rate at the InterContinental Hotel for the workshop attendees.

Registration Policy:

- Registration fee **MUST** be paid in advance for attending the Applied Technology Workshop.
- Full fixed fee is charged regardless of the length of time that the registrant attends the Workshop.
- Fixed fee cannot be prorated or reduced for anyone (Workshop chairpersons, committee members, speakers, discussion leaders, students and registrants).
- Attendees are expected to attend all workshop sessions and are not permitted to attend on a partial basis.

Cancellation and Refund Policy:

- A processing fee of **USD 100** will be charged for cancellations received before the registration deadline **18 December 2008**.
- For cancellations received after the registration deadline, **18 December 2008**, 25% refund will be made to the registrant.
- No refund on cancellations received within seven (7) days prior to the Workshop date, i.e. on or after **11 January 2009**.
- No refund will be issued if a registrant fails to attend the Workshop.

Workshop Venue:

InterContinental Hotel

Al Istiqlal Road
West Bay Lagoon
Doha, Qatar
Telephone: +974.4.844.444
Fax: +974.4.839.555

Attendees' Information:

General and detailed accommodation information will be forwarded to registrants along with the registration confirmation.

Attention Non-Members!

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Call SPE Middle East, North Africa and India on +971.4.3903540 or Email dmakhija@spe.org for more information

Tentative Technical Agenda

Sunday, 18 January

1600 - 1800 hours

Collection of Badges and Documentation

1900 hours

Welcome Reception and Dinner

Monday, 19 January

Session 1: Assessing the Risk

The risks associated with gas hydrate formation in the oil and gas industry are significant. There are various techniques in minimising these risks, from early design stage, to operation, monitoring, and mitigation. It is essential to understand the physics and mechanism of gas hydrate formation and dissociation. A vital element in assessing the risk is the hydrate stability zone under various operating conditions. The hydrate stability zone could be determined by experimental techniques and numerical modelling.

In this session, we aim to address the physics of gas hydrates, their formation/dissociation conditions, various methods for their prevention, and some of their interesting properties. Furthermore, we aim to assess the hydrate risks in gas and oil development from early design stage to monitoring and mitigation. The basic principles in experimental techniques and the latest advances in modelling are among other topics to be discussed in this session.

Session 2: Hydrate Management Using MEG

Thermodynamic Inhibitors were the first hydrate inhibitors. MEG is the most widely used for continuous treatment but methanol is typically used during well start-up. Because of the high vapour pressure of methanol there are significant losses during regeneration. Dissolved ions in produced water, CO₂ and H₂S all contribute to significant fouling problems in the regeneration process equipment. Every system is different due to process parameters and chemical reactions. This session will explore, through case histories, the reasons for fouling and some mitigation options that have been employed. The final presentation will be a case history where MEG and MeOH have been supplemented by a LDHI.

Session 3: Use of KHIs in Hydrate Management

Low dosage hydrate inhibitors (LDHI) have been used in the oil industry for about 10 years. It has only been in the last few years that these products have generally been accepted by the oil industry. Systems are now being developed that are specifically designed to use LDHI's.

This session will concern itself with the use of kinetic hydrate inhibitors (KHI), a sub-group of LDHI's. This session will involve theory, application and testing of KHI. In this session the use of KHI will be specifically discussed, as well as combinations of KHI and thermodynamic hydrate inhibitors. In addition to the application of KHI, methods to test KHI will be presented.

Tuesday, 20 January

Session 4 : Use of AAs in Hydrate Management

In contrast to thermodynamic and kinetic hydrate inhibitors, anti-agglomerants low dosage hydrate inhibitors allow hydrate crystals to form but keep the particles small, well-dispersed and therefore prevent pipeline plugging. The fluid viscosity remains low and this allows the crystals to be transported in the produced fluids.

Due to their mode of inhibition anti-agglomerants do require the presence of a suitable liquid hydrocarbon phase and GOR. However, within these limitations, anti-agglomerants have been shown to perform effectively at high levels of sub-cooling making

them suitable for deepwater applications. They have also been shown to perform well during the restart of operations after extended shut-in periods.

Points of discussion in this session include:

- Where and how anti-agglomerants are being used including a case study.
- The laboratory qualification and selection of anti-agglomerants LDHIs.

It is also anticipated that there will be a look at the wider environmental impact and fate of hydrate inhibitors.

Session 5: Future of Hydrate Control

Cold Flow concepts relate to a production system operating inside the hydrate region by forming a non-blocking slurry of hydrate particles. Several organisations are working on approaches to generate such flows, to ensure robustness towards likely operating scenarios, and to allow efficient processing. This session will look at the present status of this work and discuss future prospects.

Hydrate management using electrically heated flowlines is more established, with successful field applications in Norway and the Gulf of Mexico. With increasing challenges to provide flow assurance solutions for long subsea tie-backs, the number of these applications will increase significantly. This session will review the current status and assess how the technology is likely to develop.

Key aspects of any hydrate management strategy are monitoring and early detection methods for potential blockages. The importance of these aspects and the need to reduce risk in current and future projects will be discussed.

Session 6: Remediation of Hydrates

While much progress has been made in predicting and controlling hydrate formation by engineering design in new projects, hydrates still occur and must be dealt with in a safe, cost effective manner. Many facilities that do not benefit from current design technology are particularly susceptible to dealing with hydrates and the problems that their removal presents.

In this session traditional options that are available for hydrate removal will be discussed as well as emerging hydrate removal treatment techniques. There will also be 2 – 3 case histories presented and the attendees will be involved in designing removal options before the actual real life solutions are presented. These case histories will cover both offshore and land based examples. This will allow the attendees to learn how other operators/suppliers approach problem hydrate incidents.

Wednesday, 21 January

Session 7: Beneficial Application of Hydrates

Naturally occurring hydrates are being looked upon as a future energy source. At present, the amount of organic carbon entrapped in hydrates exceeds all other fossil fuel reserves. On the other hand, if global warming occurs, temperatures will raise and decompose some of these methane hydrates in the earth. Methane is one of the most harmful greenhouse gases.

Carbon dioxide hydrate is also important on a global scale. CO₂ may form hydrates during enhanced oil recovery and cause operational problems. Capturing CO₂ from coal-fired power plants and storing it in solid form as gas hydrate or pool of CO₂ below hydrate cap is believed to be an alternative geological sequestration method for mitigating the global warming. In this session hydrates as an energy resource and a remedy to global warming will be discussed.

Gas Hydrate Challenges in the Oil and Gas Industry

Registration Form

First Name: _____ Last Name: _____

Job Title: _____

Company: _____

Address: _____

Town/City: _____ Postcode: _____ Country: _____

Email: _____

Tel: _____ Fax: _____

SPE Member: Yes No If Yes, SPE Membership Number: _____Details of relevant experience:

_____Do you wish to present a poster? (subject to selection) Yes NoDo you wish to be considered a Discussion Leader? (subject to selection) Yes NoIf yes, please indicate which subject you would like to present on:

_____Registration Fees : USD 1,850 for SPE Members USD 1,950 for Non-members**Payment by Credit Card:**Credit Card (Check one) American Express MasterCard Visa

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Card Number (will be billed through Society of Petroleum Engineers)

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Expiry Date (mm/yy)

Name of Credit Card Holder (printed): _____

Billing Address including Zip Code/Postal Code of Card: _____

Signature (required): _____

Date: _____

Cancellation and Refund Policy:**Payment by Bank Transfer: IMPORTANT - For Reference: Please Quote "09ADOH" and Name of Delegate**

Make Payment to: HSBC Bank Middle East, Jebel Ali Branch, PO Box 66, Dubai, UAE

Account Name: SPE Middle East FZ-LLC

Account Number: 035-129709-100

Swift Code: BBMEAEAD

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To submit your registration online, please visit the
SPE Web Site at: www.spe.org
or email this form to : formsdubai@spe.org.
or fax this form to: +971.4.3664648

