Technical Committee

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About the Workshop

EAGE will host the first workshop in the Asia-Pacific region on EM Exploration for Hydrocarbons. The workshop will be held from 11-13 April 2012 in the Pan Pacific Orchard, Singapore.

The goal is to bring together key experts, sceptics and managers from oil companies, contractors and research institutions to share and discuss their experiences of EM in different settings. The objectives are to disseminate EM technology and good practice, build a common interest group in the E&P industry and discuss future opportunities for the growth of EM. Unlike conventional short-presentation-based conferences, emphasis is placed on learning from each other through frank discussions of the practice, future challenges and innovation of EM.

The distinguishing feature of this workshop is its focus on discussing how people have used the technology, if the efforts have been perceived to add value to the exploration effort and what might be done differently in future to maximize the potential of the technology. Only those actively involved in the oil and gas business have been invited as speakers at this workshop. The benefit of the workshop is maximized by getting the operating companies to discuss their case studies candidly. Importantly, the workshop not only focuses on the success stories, but also discusses the failures that people have experienced and how to avoid them.

The workshop comprises of a keynote address and seven sessions spread over two days of informal discussions prompted by selected presentations. The format requires active audience participation. Sessions will be conducted off the record to encourage frank discussion.

Sessions
1. Applicability of EM in E&P Business Strategy
2. Evolution and Future Growth Areas of EM
3. Potential Pitfalls in the Interpretation of EM Surveys
4. Case Histories of Successes and Failures in the Use of EM in the Asia-Pacific Region and Beyond
5. Robust Quantitative Interpretation of EM Surveys – How Far Have We Come?
6. Subsalt, Sub-basalt and Carbonate Mapping
7. Shallow-water EM

Short Course

A one-day short course on “Marine EM Methods for Petroleum Exploration” is also given on 13 April 2011 by Steve Constable from the Scripps Institution of Oceanography.

Course outline

Marine electromagnetic methods (controlled-source EM and the magnetotelluric method) have been embraced by the industry as a way to reduce risk and improve exploration efficiency. Estimates of seafloor electrical conductivity obtained using EM surveys can be used to generate geological and structural models, and even, given appropriate conditions, detect the existence of hydrocarbon reservoirs. While EM methods will never achieve the resolution of seismic methods, they are intrinsically more powerful than potential field methods (gravity, magnetics) and provide a more direct estimation of fluid content than using acoustic properties alone. Marine EM has the potential to play an important role in any integrated exploration strategy. The objective of this course is to provide a working understanding of this technology.

We will discuss why electrical methods are useful, the electrical conductivity of Earth materials and the dependence on temperature and porosity, and basic electromagnetic theory. We will outline the history of the method, starting with academic work and moving on to efforts by industry and the emergence of contractor companies. We will describe the equipment needed to carry out marine EM surveys and the key technological issues that make the difference between good data and bad. We will discuss operational and logistical issues in mounting a marine EM campaign. Processing both controlled source and magnetotelluric data will be explained. The theory of controlled source EM and magnetotelluric propagation in the marine environment will be introduced and illustrated with simple one-dimensional modelling, followed by an explanation of 2-D and 3-D computational methods and issues of target size, resolution, discrimination, etc. Inversion methodology will be presented. The effects of anisotropy, the air wave, and the confounding effects of shallow structures will be examined. Finally, example data sets will be shown and discussed.

Who should attend?

This course should be of interest to anyone wishing to use or understand marine EM data in an exploration arena, whether they are exploration managers and geoscientists wishing to commission surveys or exploit existing data, or new recruits within the contractor industry. Academics wishing to include aspects of marine EM into their curricula should also find this course helpful.
About the instructor
Steven Constable studied geology at the University of Western Australia, graduating with First-class Honours in 1979. In 1983 he received a PhD in geophysics from the Australian National University and later that year moved to the Scripps Institution of Oceanography in La Jolla, California, where he currently holds a professorial position. Constable is interested in all aspects of electrical conductivity and has made contributions to inverse theory, electrical properties of rocks, mantle conductivity, magnetic satellite induction studies, global lightning and instrumentation. However, his main focus is marine electromagnetic methods; recent efforts have involved the commercialization of marine EM for hydrocarbon exploration, where he played an important role in the early adoption of marine EM methods by industry. This work was recognized by the G.W. Hohmann Award in 2003 for ‘outstanding achievement in electrical/ electromagnetic methods that has led to a significant improvement or discovery in gas or oil exploration’ and the 2007 SEG Distinguished Achievement Award to Scripps. During his career, Constable has spent 700 days at sea on research cruises, published 80 papers and book chapters and had 4 patents issued in his name. He is a member of AGU, EAGE, the RAS and the SEG. He has served as an associate editor for the journal Geophysics and as a section secretary and corresponding editor for the American Geophysical Union.

Technical Programme

Tuesday 10 April

17:00 Registration
18:00 Welcome Reception

Wednesday 11 April

08:30 Welcome
09:00 Keynote Address - Marco Polo Buonora (Petrobras)
09:30 Coffee Break
10:00 SESSION 1: APPLICABILITY OF EM IN E&P BUSINESS STRATEGY H. Anderson (Fugro EM)
   EM Journey: The Pain and Pleasure - R. Bastia (Reliance)
   CSEM at Work for Shell: Maturing a Technology and Putting it to Use - J. Voon/M. Rosenquist (Shell)
12:00 Lunch
13:00 SESSION 2: EVOLUTION AND FUTURE GROWTH AREAS OF EM S. Constable (Scripps Institute of Oceanography)
   The Past, Present and Future of CSEM: A Commercial Perspective - R. Cooper (Rock Solid Images)
   Challenges to Marine CSEM for Hydrocarbon Exploration - D. Smit (Shell)
   Reservoir Production Monitoring with CSEM: Challenges and Opportunities - A. Orange (UCSD)

Thursday 12 April

08:30 SESSION 4: CASE HISTORIES OF SUCCESSES AND FAILURES IN THE USE OF EM IN ASIA PACIFIC AND BEYOND S. Kumar (PETRONAS Carigali)
   Onshore EM exploration in South-East Asia: Goals, Techniques, Advantages - Y. Agafonov (Irkutsk Electrometeprospecting Company)
   Joint Inversion of Multi-domain Geophysical Data Based on Rock Properties - P. Dell’Aversana (Eni)
10:30 Coffee Break
10:45 SESSION 5: COMPRESSIVE IMAGING WITH HYPERSpectral EM Data: Parallelization and Performance Optimization T. Habashy (Schlumberger)
   Compressive Approaches for Nonlinear Inversions of CSEM Data - A. Abubakar*, T. M. Habashy, Y. Lin, & M. Li (Schlumberger Doll Research)
**Accommodation**

Pan Pacific Hotel Orchard has been chosen as the venue for the workshop. Room reservations for the hotel can be made via an E-Direct booking channel that is linked to the event website. All bookings via this channel must be made and confirmed by 1 March 2012.

### Room categories

<table>
<thead>
<tr>
<th>Room categories</th>
<th>Single Occupancy</th>
<th>Twin Occupancy</th>
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<tbody>
<tr>
<td>Premium Deluxe Room</td>
<td>S$ 295++</td>
<td>S$ 315++</td>
</tr>
<tr>
<td>Business Room</td>
<td>S$ 330++</td>
<td>S$ 350++</td>
</tr>
</tbody>
</table>

Rates quoted are per room per night (including daily buffet breakfast and unlimited broadband access). The above group rates are extended to us by the hotel. Rates quoted herein are subject to a 10% service charge and thereafter 7% Goods & Services Tax (GST), the calculation on the total should be multiplied by 1.177 to obtain all inclusive rates.

Alternatively, bookings can also be made via online reservation with the hotel directly but rates may differ from those quoted as above. Kindly take note of the terms and conditions when booking is done via other means, as they may differ accordingly.

**Sponsors**

**Gold sponsors**

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- RGS
- Shell

**Bronze sponsor**

- WesternGeco
- RSI

**Registration**

**Overview of Registration Fees**

<table>
<thead>
<tr>
<th>Workshop</th>
<th>Registered and paid</th>
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<tbody>
<tr>
<td></td>
<td>Until 10/2/2012</td>
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<tr>
<td></td>
<td>11/2/2012 – 2/4/2012</td>
</tr>
<tr>
<td>EAGE members</td>
<td>€ 525</td>
</tr>
<tr>
<td>Non-members¹</td>
<td>€ 600</td>
</tr>
<tr>
<td>Short Course</td>
<td>deadline 2/4/2012</td>
</tr>
<tr>
<td>EAGE members</td>
<td>€ 390</td>
</tr>
<tr>
<td>Non-members</td>
<td>€ 490</td>
</tr>
</tbody>
</table>

¹ The non-member fee includes EAGE membership for 2012.

The EAGE members’ rate is only applicable if the membership dues for 2012 have been paid.

**Cancellation and Changes Policy**

Registration fees will be refunded as follows:

- Cancellation received before 13/2/2012: full refund (after the event) minus an administration fee of € 35 per person. Non-members, please note: membership fee included in the workshop fee will not be refunded; membership will remain active.
- Cancellation received on or after 13/2/2012: no refund will be made. For non-members, please note your included membership will remain active for 2012.
- Transfer of your registration to another name will cost a € 35 administration fee, plus any differences in delegate types, where applicable (for instance when changing a registration from a member to a non-member).

**How to register**

We recommend that you register via the on-line registration form on the EAGE website (www.eage.org). However, a downloadable registration form is also available on the EAGE website which should be completed and returned to:

EAGE Asia Pacific Sdn. Bhd.
UOA Centre
Office Suite 19-15-3A,
No.19, Jalan Pinang
50450 Kuala Lumpur
Malaysia
Fax: 00 6 03 2722 0143
E-mail: asiapacific@eage.org

**Contact**

For more information or enquiries about this workshop, please visit the event’s website (www.eage.org) or contact the EAGE Asia Pacific Office via asiapacific@eage.org or telephone +603 2722 0140.

We look forward to seeing you in Singapore!