



PGK

Petroleum Geologische Kring

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<b>Venue:</b>	PGK's monthly meetings are held at the KIVI building, Prinsessegracht 23, Den Haag. Drinks are served from 17:00 hrs; the lecture starts at 18:00hrs.	<a href="http://www.pgknet.nl">www.pgknet.nl</a> <a href="https://twitter.com/PGKring">twitter @PGKring</a>	
<b>Membership:</b>	Apply for membership through the PGK website. The annual fee is €15.-		
<b>Accounts:</b>	ABN/AMRO Bank: 88.65.82.733 (PGK, Den Haag)		

## MARCH 2013 NEWSLETTER

If you are one of the 144 members who have paid their **2013 membership fees**, thank you. If you are one of the 240 members who have not, **please transfer € 15 now** to account number 88.65.82.733 of PGK, Den Haag, and indicate *your name* and *membership fee 2013*.

### 5<sup>TH</sup> OF MARCH 2013: AAPG LECTURE

**AAPG** lecture will be held at Shell, Kessler Park 1, 2288GS, Rijswijk. **Mandatory registration** with the PGK secretary before March 2<sup>nd</sup>.

16:00 – 17:00 hrs. Lecture by: Mohammed S. Ameen

A Paradigm Shift in Understanding Fracture Origin and Fracture Influence on Deep Carbonate Reservoir

Performance: A Study of Onshore Permo-Triassic Deep Reservoirs in Saudi Arabia

*Abstract on separate page*

### 20TH OF MARCH 2013: PGK MEETING

The next PGK meeting will be on Wednesday, March 20<sup>th</sup>, 2012 at the KIVI building, Prinsessegracht 23, Den Haag.

17:00-18:00 hrs: Social hour

18:00--19:00 hrs: Lecture by: Jacopo Spinnler

Coal Bed Methane challenges and technical solutions

*Abstract on separate page*

### 23RD OF MARCH 2013: LGV DIES NATALIS

PGK members are invited to participate in this day of presentations on the Triassic. Details of the program and registration on separate page.

### 17TH OF APRIL 2013: PGK MEETING

The April meeting takes place on Wednesday, 17<sup>th</sup> of April 2013. Lecture "Recent seismicity in Groningen: a lecture by State Supervision of Mines" by Annemarie Muntendam.



### **19TH OF APRIL 2013 – PGK DAY TRIP**

Coal from the Netherlands: a day trip to discover history and geology of the coal district in Limburg. More information and registration on [www.pgknet.nl](http://www.pgknet.nl).

### **SEPM SPECIAL PUBLICATION 98: ROTLIEGEND OF THE NETHERLANDS**

It has been over a year since the SEPM SP 98, "Rotliegend book" or "Slochteren book" was presented by Jürgen Grottsch on the PGK meeting and sold during the buffet. Thirty paper copies were sold and additional thirteen people registered for a follow up order. In addition, 4 paper copies of the SEPM CSP 8: Carbonate Sedimentology and Sequence Stratigraphy, by Wolfgang Schlager were sold. SEPM (after several attempts from me to get in contact) told me that all paper copies of the SP 98 were sold out and more could not be provided.

SEPM suggests the following for those people who did not buy a copy of SP 98 and wish to order one:

1. The GSL (Geological Society of London) bookshop still has several paper copies of the SP 98, ordering there saves shipping costs. <http://www.geolsoc.org.uk/en/Publications/Bookshop/>
2. The CD version of the SP 98 is available. CD on an out of print book is \$28 list and \$20 member prices. <https://members.sepm.org/iMISpublic/Core/Orders/Default.aspx>
3. SEPM and Elsevier are working on making all SEPM books available via the Elsevier Geofacets platform incl. geo-referenced digital maps becoming available next to regional map based literature search facilities. But this will certainly take some more time until it will be available with users and requires licensing from Elsevier.
4. In the future there will be a "print on demand" option of soft cover copies, as well as digital copies in the SEPM online archive, but this is for much later in the year (probably June earliest)

For the people who bought but not yet paid for their paper copy during the meeting, I would like to ask you to transfer the amount of €65,00 for the Rotliegend book and € 42,00 for the Carbonates book to my personal bank account: Bram van der Kooij, ING bank, account number: 6418553, Leidschendam. Please mention PGK SP98 (Rotliegend) or PGK CSP8 (carbonates) and send me an email upon transfer. I will prepare a receipt for you to confirm the payment (and me receiving it).

Thank you very much for your patience and understanding and my SINCERE APOLOGIES for this late approach and arrangement. For further questions, please contact me by email: [bram.vanderkooij@gmail.com](mailto:bram.vanderkooij@gmail.com)

### **NEW MEMBERS**

Applications for membership have been received from Jasper van Bruchem (EBN), Michiel Koolschijn (UvU), Jeroen van der Molen (TNO), Roeland Nieboer (UvU), Sjoerd Tolsma (UvU), Matthijs van Winden (UvU), Kinvaç Yücel (Fugro). If no objections are received prior to or during the next meeting, they will be admitted as member of our society.

### **TWITTER**

We are now on Twitter @PGKring. The account shall be used to announce events, send reminders for events and occasionally to retweet interesting items. So follow us on twitter!

### **LINKED-IN**

We also have a group on linked-in (called PGK), that our members may join. Any member of the group is free to list subjects there. Requests to the secretary for linked-in contacts will be ignored, as the secretary function does not have a linked-in account.

**PROGRAM PGK MEETING WEDNESDAY MARCH 20TH, 2013**

Address: KIVI Building, Prinsessegracht 23, Den Haag

Social hour: 17:00 - 18:00

Lecture: 18:00 - 19:00

**Coal Bed Methane challenges and technical solutions**

Jacopo Spinnler (*Shell International E&P*)

**Abstract**

Shell is actively pursuing CBM (Coal Bed methane). Areas of activity span four continents, with a particular focus on high graded basins in SE Asia and Australia (including Indonesia China and Australia). The evaluation of CBM opportunities requires a specific evaluation workflow that addresses the differences between conventional oil and gas and CBM. In unconventional resources, recoverable volumes strongly depend on the results of the interaction among subsurface, surface development, and economic criteria. Therefore the various technical disciplines need to work together in a strongly integrated way to create realistic field development scenarios that can be used to assess volumetric recovery. Geological data types to be integrated in the evaluation are often available as the result of coal mining and conventional oil and gas activities within the coal basin. HSSE risks identification, and formulation of mitigation activities must be integral parts of the early project assessment workflow, given the large environmental and societal footprint of the tight well spacing development scheme required by CBM.

The methodology applied in Shell to estimate recoverable volumes at the CBM prospect and portfolio level explicitly recognizes risks and success volumes, to determine expected (risked) volumes. A particular challenge in the evaluation of CBM opportunities is the prevalent usage in the industry of SPE reserves categories applied to a well spacing grid, in an approach that mainly ignores geological controls and subsurface risks and uncertainties.

Aspects of three Shell CBM projects are discussed, highlighting the concepts exposed earlier.

**Please post this page on your company's notice board. Members may be accompanied by guests!**

**Thanks to our sponsors:**

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**WEBSITES**

If you come across interesting websites that may be of use to other members of the PGK, please send the URL to the web master (raik.bachmann@sgs.com), who will share them on the PGK website.



PGK

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### **23RD OF MARCH 2013: LGV DIES NATALIS**

The Leidse Geologische Vereniging will celebrate their 80<sup>th</sup> anniversary (Dies Natalis) on Saturday March 23<sup>rd</sup> 2013, in the "Pesthuis" annex of the Naturalis Museum in Leiden. Theme of the day will be the Triassic, see details on a separate page

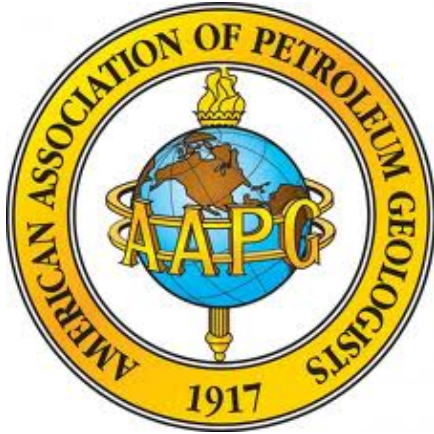
The Dies celebration is normally attended by LGV members only, since it also serves as the formal annual meeting of the Society. However, the Triassic is not being discussed very often, and all three speakers have strong affinity with the Petroleum Industry. PGK members may therefore be interested in these lectures. At the same time, we think that the presence of active members of the industry may enhance the meeting and the discussions. PGK members are therefore cordially invited to participate in this event, by sending a mail to our secretary, Frits Bonvie [bonvies@cs.com](mailto:bonvies@cs.com) and by transferring € 37 to account 566420457 of the Leidse Geologische Vereniging. This amount, which also applies to LGV members, covers attendance of the 3 lectures, coffee, tea, and lunch.

### **Programme L.G.V. Dies Saturday March 23<sup>rd</sup> 2013**

- Address: Pesthuis Naturalis, Darwinweg Leiden
- 10.00 Reception, registration, coffee
- 10.40 Opening by Jaap Focke, praeses L.G.V.
- 10.45 Lecture by Prof. Dr. Jonathan Redfern  
*"Pangaeon Triassic Atlantic borderlands"*
- 11.45 Lecture by Prof. Dr. Brian Williams  
*"Onset of Triassic rift sedimentation, Fundy Basin, Nova Scotia, Canada"*
- 12.45 Lunch in the Pesthouse
- 14.00 Lecture by Dr. Arie Speksnijder  
*"The Triassic under your feet"*
- 15.00 Teabreak with annotated video about the late Prof. Henk Zwart
- 16.00 Annual society meeting (LGV members only)

Register at: [bonvies@cs.com](mailto:bonvies@cs.com)

Transfer fee: €37 into 566420457 of Leidse Geol Ver



## **AAPG Regional Lecture Program in the Netherlands**

**Date:** 5 March 2013

**Time:** 4-5 pm

**Venue:** Shell Rijswijk, Kessler Park 1, 2288GS, Rijswijk

**Participants:** AAPG & PGK members are welcome (registration through PGK is required, maximum participants: 60)

**Title: A Paradigm Shift in Understanding Fracture Origin and Fracture Influence on Deep Carbonate Reservoir Performance: A Study of Onshore Permo-Triassic Deep Reservoirs in Saudi Arabia\***

**Presenter: Mohammed S. Ameen<sup>1</sup>**

### **Abstract\***

Characterizing fractures and their geomechanical impact on reservoir performance is the ultimate objective of fracture and in-situ stress characterization. This presentation provides evidence contrary to the common perception of the major role played by fractures in the production performance of deep carbonate reservoirs. It is based on a recent study by Saudi Aramco in Saudi Arabia.

The highly variable performance of the Permo–Triassic reservoirs in onshore giant fields in Saudi Arabia has been attributed to the presence of natural fractures. Similar preproduction pressure profiles and hydrocarbons in the different reservoir units have been attributed to vertical communication through large faults. To validate these assumptions, we studied the static and dynamic data from the reservoirs. We identified two distinctive fracture domains based on fracture orientation and density. Fracture evolution is mainly controlled by extensional and consequent compressional plate tectonics instead of local structures. In-situ stresses in the study area are dominated by the Zagros plate tectonics and affect fracture aperture differently in the two fracture domains. The impact of fractures on reservoir performance is mostly subtle because of the nature and distribution of the fractures. Fracture-enhanced productivity occurs locally in some of the producing wells, and results from high-density fracture clusters (including mesoscopic faults) with channel-type apertures. The reservoir performance is mainly controlled by the matrix porosity and permeability that were preserved by early hydrocarbon placement.

The following findings challenge the common views on the influence of fractures in the reservoir performance: (1) individual fractures are dominantly tensile and small (mesoscopic and microscopic); (2) individual faults are small and not readily resolvable at seismic scale; (3) the depth and carbonate nature of the reservoir make the fractures highly susceptible to fast healing unless preserved within the hydrocarbon column; (4) initial vertical pressure gradient changes with production indicate a lack of present-day communication across the anhydrite sealing layers between the different reservoir units; (5) horizontal well direction does not generally have an impact on productivity; and (6) sustained and heavy losses of circulation are rarely encountered in the reservoir wells.

\*Abstract from 2010-2011 AAPG Foundation Distinguished Lecture presentation, Middle East Region.

<sup>1</sup>Western Area Exploration Department, Saudi Aramco, Dhahran, Saudi Arabia (mohammed.ameen@aramco.com)

## **Biography:**

### **MOHAMMED S. AMEEN**

#### **The Structural Geology & Rock Mechanics Group, Saudi Aramco, Dhahran, Saudi Arabia**

Mohammed S. Ameen received his Ph.D. and Diploma of Imperial College in structural geology and geomechanics from Imperial College, London, in 1988. He has 25 yrs of academic and industrial experience and has patented a new method for the characterization of microfractured reservoirs.

He has authored and coauthored 27 articles on fractures, folds, and geomechanics and edited three special publications for the Geological Society (London). His pioneering work on fractures and folds across the Taurus-Zagros Range, Iraq, covered 30 major fold traps and is published in the AAPG Bulletin, the Geological Magazine, the Journal of Petroleum Geology, and the Proceedings of the Conference on Fractured and Jointed Rock Masses, Lake Tahoe, California, USA, June 3-5, 1992. Subsequently, Ameen worked on geotechnical, environmental, and hydrocarbon-related projects in Europe and the Middle East, including nuclear waste repositories and strategic gas storage in depleted reservoirs.

Ameen joined the Reservoir Characterization Department at Saudi Aramco in 1998 as the in-house fracture and geomechanics specialist dealing with development issues. Between 2004 and early 2012 he established and led the Structural Geology and Rock Mechanics Group in the Exploration Technical Services Department, Saudi Aramco. He is currently the lead Geomechanics and Fracture Consultant in the North West Area Exploration Department focusing on unconventional prospects evaluation, stimulation and delineation.

In his 15 year career with ARAMCO he has researched and dealt with exploration and development applications of fractures and geomechanical characterization in the vastly diverse reservoirs and environments across Saudi Arabia (carbonates, clastics, conventional and unconventional). His recent publication on the deep Khuff carbonate gas reservoir (AAPG Bulletin, January 2010) set a paradigm shift in understanding fractures and their impact on carbonate reservoir performance. Ameen was the 2011 AAPG Distinguished Lecturer, which was awarded for his work on the Khuff carbonate reservoirs. He recently published benchmark results of his extensive research work on the diverse properties of fractures and their impact on conventional and unconventional sandstone reservoirs in Saudi Arabia (AAPG Bulletin, March 2012).

Ameen's research on improving fracture characterization methods won him innovation awards and two registered US patents on fracture characterization methods, one in 2008 and one 2012.

He is an associate editor of the AAPG Bulletin, and instructor of short courses for the AAPG (Petrobras, Rio, 2010, AAPG ACE, Houston 2010 and AAPG ICE, Milan, 2011) and the Upstream Petroleum Development Center, Saudi Aramco. Ameen is an active member of the AAPG, Society of Petroleum Engineers, European Association of Geoscientists and Engineers, and the Geological Society (London).

Co-sponsor:

