

PETROLEUM GEOLOGISCHE KRING



KONINKLIJK NEDERLANDS GEOLOGISCH MIJNBOUWKUNDIG GENOOTSCHAP PGK

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Venue:	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.		www.pgknet.nl
Membership:	Apply for membership by contacting the secretariat. The annual fee is €15.-		
Accounts:	Fortis Bank: 88.65.82.733 (PGK, Den Haag)		

NOVEMBER 2009 NEWSLETTER

18 NOVEMBER:

The next PGK meeting will be on **Wednesday, November 18, 2009**. The programme will be as follows:

17:00-18:00 hrs: Social hour

18:00-19:00 hrs: Lecture by Bernard Geiss, Total E&P Netherlands

“Impact of subtle transfer faults on the fields of the Klaverbank High”.

Abstract on other side

DECEMBER MEETING

The December meeting is the annual Christmas meeting and takes place on **Wednesday, December 9, 2009**. There will be a lecture given on “*Proto-geology and birth of geology in the Netherlands*” by Tom Reijers. This year's Christmas dinner will be held at the Restaurant Babbilage in The Hague (<http://www.babbilage.nl>).

EBN-TNO WORKSHOP

The fifth EBN/TNO workshop “Using “Seismic amplitudes for high-grading prospects and reservoir characterisation” – examples from deep and sub salt reservoirs in the Netherlands.

When: January 14, 2010

Where: Auditorium of TNO-B&O, Princetonlaan 6, Utrecht

Deadline for pre-registration: December 1st, 2009 (mail to: Organisatie-BenO-SecretariaatGEenGI@tno.nl). See other side for more info

NEW MEMBERS

Applications for membership have been received from Peter Brand (Cirrus Energy), Frederic Fuegel (Panterra Geoconsultants), Wouter van der Zee (Geomechanics International) and Linda Garming (TNO). If no objections are received prior to or during the next meeting, he/she will be automatically admitted as member of our society.



PETROLEUM GEOLOGISCHE KRING

KONINKLIJK NEDERLANDS GEOLOGISCH MIJNBOUWKUNDIG GENOOTSCHAP **PGK**

Monthly meeting: Wednesday 18 November 2009
Address: KIVi building, Prinsessegracht 23, the Hague
Social hour: Between 17:00 and 18:00 hrs
Lecture: 18:00-19:00

“Impact of subtle transfer faults on the fields of the Klaverbank High”

By Bernard Geiss

Total E&P Netherlands

ABSTRACT

Understanding the effect of faults on field compartmentalisation and on fluid flow is of key importance for the exploration and production of hydrocarbons. On the Klaverbank High subtle transfer faults play an important role in reservoir compartmentalisation and fluid migration

The structural setting of Permian gas reservoirs in the K4 and K5 blocks of the Dutch central offshore is mainly controlled by two sets of faults; N120-N150 oriented normal or inverted faults generally with large throws and N45 oriented faults exhibiting subtle throws accommodating normal and transfer movements. Together, they form a checker-board pattern of horst and graben structures.

As the throw of the N45 faults is generally at the limit of the seismic resolution, they have been difficult to identify and describe in the past. Nevertheless, recent advances in PSDM seismic imaging and dedicated imaging improvements help to recognize these faults creating small graben features along en echelon patterns.

Despite their subtle vertical throws, within the range of the reservoir thickness, some of the N45 faults act as strong baffles separating pressure differences in excess of 200 bars as well as small amounts of depletion - a few bars over a 5 year period.

A detailed analysis of these faults is presented together with a quantification of their sealing potential by calculating fault permeabilities using Shale Gouge Ratios which in turn were used to match the dynamic history in the reservoir model.

In addition, an exploration failure is analysed in the light of these faults, as they may create a barrier for the successful charging of structures in their migration shadow.

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**Fifth EBN-TNO one-day workshop on
“Using seismic amplitudes for high-grading prospects and
reservoir characterisation” – “Direct hydrocarbon indicator”
examples from deep and sub salt reservoirs in the Netherlands”
Organised by EBN and TNO Geo-Energy
Thursday 14 January 2010, Utrecht**

<p>Date : Thursday January 14th 2010 Time : 9.30 – 18.00 Venue : Auditorium of TNO-B&O, Princetonlaan 6, Utrecht (route map on www.tno.nl) Deadline for pre-registration: Dec 1st 2009 Pre-registration costs : Euro 50 On-site registration: Euro 100</p>	<p>Included : Proceedings, lunch and drinks Registration : TNO Business Unit Geo-Energy by tel : 030 256 4511 by fax : 030 256 4605 (or e-mail : mailto:Organisatie-BenO-SecretariaatGEnGl@tno.nl) <u>Payment details:</u> ING account nr # 68 94 93 061 on behalf of TNO Bouw en Ondergrond, Delft with reference to: "034.21853 - EBN Symposium Amplitudes"</p>
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Background

In the exploration of the Dutch subsurface amplitude studies have been in use for over 30 years. However, even with the help of sophisticated 3D acquisition and imaging techniques, until recently amplitude information failed to significantly improve success rates in exploration wells. During this 30-year time span amplitude techniques often turned out to be unsuccessful in delineating hydrocarbon traps or in de-risking prospects. The use of amplitude information for deeper formations particularly the sub-salt Rotliegend, proved extremely difficult. During the last few years we have witnessed the development of new seismic processing techniques that have significantly improved the quality and value of amplitude information. In 2008 at the EAGE, Bruhl *et al.* presented a paper on DHI enhancement. In this study they illustrate that more consistent results can be obtained by the use of stacking technology.

Are these methods the way forward? Can we now expect a string of exploration successes comparable to introduction of 3D seismic during the early nineties? Our 30-year experience has taught us several explanations why amplitudes give poor results in certain areas and formations. If we want to harvest the benefits of new processing techniques, one of the key questions is whether we need new acquisition or that we can reuse old 3D surveys. This symposium aims to fill these and a number of other gaps in our knowledge. The workshop will touch on the theoretical background but will also highlight a number of detailed examples of amplitude responses in the Netherlands.

Workshop format and content

During the fifth E&P workshop organized by EBN and TNO we want to share some insights into the latest views on gas field delineation and prospect de-risking using amplitudes with contributions of a number of operators in the country. The new insights are not only important during exploration, but are also important during field development.

You will hear state of the art opinions on amplitude enhancement. Operators active in the Netherlands will highlight some of these techniques by presenting case studies. Examples of questions we hope will be answered are:

- What realistically may be expected from the latest techniques.
- Under which geological conditions new techniques can be applied.

Primary target group

Geologists and geophysicists involved in the exploration and exploitation in the deeper subsurface of the Netherlands