

PETROLEUM GEOLOGISCHE KRING

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MAY 1997 NEWSLETTER

FORTHCOMING PGK EVENTS

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|-----------------|---------------------------------------|--|
| May 21 | Simon Knight
TU-Delft, TG | Stratigraphic and Structural controls on Reservoir
Connectivity: a 3-D Modelling Approach. |
| June 19 | J.-Michel Champanhet
Elf Petroland | The use of Coal Facies in stratigraphic Correlation of the
Carboniferous of the Netherlands Offshore (subject to
confirmation) |
| Sept. 17 | Janos Urai
University of Aachen | The Sealing Capacity of Mudstones |

PGK MAY MEETING

The PGK May meeting will be held on **WEDNESDAY, May 21**, at 17:45 pm and will be preceded by aperitifs from 17:00 pm onwards. The lecture will be held at the KIVI building, Prinsessegracht 23, The Hague.

Simon Knight of the Faculty of Applied Earth Sciences, TU Delft, will speak about "Stratigraphic and Structural controls on Reservoir Connectivity: a 3-D Modelling Approach"

The newly developed reservoir modelling package 'FaMOUS' (Fault modelling of Oneven Stratigraphy) possesses functionality which permits modelling of any sedimentary architectural element, seismic and sub-seismic faults and well/seismic data. This lectures integrates high resolution sequence stratigraphy, with the use and further development of FaMOUS to predict reservoir architecture and build high resolution cellular reservoir models to visualise reservoirs in 3-D and to examine depositional connectivity per systems tract. The introduction of seismic and sub-seismic fault populations into a variety of reservoir volume models and subsequent output to fluid stimulation has allowed quantitative assessment of the effects of fault-related and sedimentary compartmentalisation.

A high resolution sequence stratigraphic approach has been adopted for the time-stratigraphic correlation of a complex Carboniferous fluvial -deltaic succession (subsurface Alaska) and Cretaceous shallow marine clastic strata (Book Cliffs outcrops, Utah). Mapping of flooding surfaces widespread lowstand erosion surfaces has provided a robust framework for confident correlation of reservoir units. Predictably, differences in sand body geometries and shale permeability barrier distributions are controlled by facies partitioning through systems tracts within each high frequency sequence and by the position of each conformity bounded sequence within the low order 'background' sequence set.

Incised valleys fills have been recognized within the the predominant fine-grained coastal plain succession of the Kekikutuk Formation, and with shallow marine strata of the Grassy Member, Blackhawk Formation. These valley systems, although characterized by complex lateral and vertical facies stacking patterns, contain sandstones with permeabilities up to an order of magnitude higher than the bay fill/swamp/shoreface strata they incise into. The valleys represent an important element of the reservoir architecture; valley sandstones may contain considerable hydrocarbon reserves and

may increase reservoir connectivity by vertically connecting different aged valley systems and distributary channel sandstones with upper/middle shoreface rocks. The single phase flow results derived from testing model sensitivities to stratigraphic parameters have shown that high permeability valley fills provide the main conduits for fluid flow through the reservoir. The examination of effective permeability and faulting has clearly shown that neutral (non-sealing) sub-seismic faults have little effect on flow through the reservoir model tested. Decreasing transmissibility multipliers assigned to fault surfaces and increasing the fault density leads to dramatic reduction in fluid flow and connectivity through the reservoir. The fluid flow through both shallow marine and fluvial reservoirs studied in this investigation is mainly controlled by the sedimentology and stratigraphy, except in cases where the faults have fault rock permeabilities more than three orders of magnitude less than those of host rock sandstones.

OTHER EVENTS OF INTEREST TO PGK MEMBERS

- May 19** SPE Meeting: Harteveld, B and Zalen, H. van, "Underground Gas Storage", The Hague, contact Barbara Grunert, Schlumberger (070-310 5400) for details.
- May 26-30** EAGE Annual Conference & Exhibition, Geneva, Switzerland
- June 2-3** SPE European Formation Damage Symposium, The Hague, contact Barbara Grunert, Schlumberger (070-310 5400) for details.
- June 4** SPE 1 day course, "Modern Well Testing" by Prof. Cor van Kruijsdijk, Delft, contact Barbara Grunert, Schlumberger (070-310 5400) for details.
- June 19** DPS Meeting: Clive Needham (Westen Atlas), "Image Analysis System Icarus", contact P. Crossouard, Schlumberger (070-310 5400) for details.

MEMBERS NEWS

We have received one application for membership from **Drs. Joris F. Siermann**, a geologist currently employed with NITG-TNO. If no objections are received by the end of the next meeting they will automatically be elected member of the society.

PGK ON THE WEB

Members with e-mail and Eudora (preferably running on a Macintosh) may also receive the newsletter digitally from the following address n.ontijn@nitg.tno.nl. EudoraLight can be obtained free from the following site: <http://lorien.qualcomm.com/quest/commercial.html>. The PGK has a new home page on the Web. The address for those interested is: <http://wwwak.tn.tudelft.nl/~pgk/index.html>. Many thanks go to Frédéric Verhelst and Aart-Jan van Wijngaarden of the Centre for Technical Geoscience, LSA, Fac. of Applied Physics, Delft University of Technology.

TIES

The traditional dark blue and new "Red Stripe" PGK tie will not only smarten you up but makes an excellent business gift for foreign clients and visitors. The ties cost f 25,- each and they can be obtained from the secretary. Both designs are available for sale at every meeting.

SPONSORSHIP

The PGK is very grateful to its sponsors who have been helping to finance the cost of renting the KIVI lecture room, tickets and accommodation for overseas lecturers, monthly drinks for members and contributing to the cost of the field seminars. The following companies are warmly thanked for contributing to our activities in 1997:

ARGO GEOLOGICAL CONSULTANTS, DSM ENERGIE B.V., ENERGIE BEHEER NEDERLAND, PANTERRA GEOCONSULTANTS B.V., SCHLUMBERGER PETROLEUM B.V., SHELL NEDERLAND B.V., WINTERSHALL NOORDZEE B.V.

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