Poster 7

Fluid inclusion screening of 16 Carbonate wells from Central Luconia, offshore Sarawak — final results

PIET LAMBREGTS

SMEP, Sarawak Shell Berhad
Locked Bag No. 1
98009 Lutong, Sarawak, Malaysia

Fluid inclusion screening (FIS) is a fast and cost effective technique, which has been used routinely in the oil industry for several years now. With this technique cutting samples are dried and crushed, fluid inclusion volatiles are released and then analysed in a mass spectrometer. This provides a log of palaeofluids and/or present day geochemistry throughout the stratigraphy and reveals information on hydrocarbon composition, migration, seals and proximity-to-pay zones.

Historically in Central Luconia the Miocene carbonate build-ups have been the main exploration objective. The key risks associated with this play are the charge and retention risks as a number of structures were dry whereas nearby structures, in a similar geological setting, were found gas-bearing. For the ongoing evaluation of the remaining prospectivity of the carbonate build-ups in the Luconia province it is important to know if structures are dry due to "lack of charge or lack of migration focus" or due to "retention failure". This technique can provide a quick and cost effective way to resolve some of these questions.

A successful pilot study was carried out in 2001 using eight recent carbonate wells as a calibration set. This study is a follow-up, in which 16 wells were analysed. These wells are mostly dry, with a few gas-bearing calibration wells and deep (pre-Carbonate) penetrations.

The results of this fluid inclusion analysis had a good fit to the well and seismic data, but not as good as in the pilot study. Indications for top seal failure, lateral seal failure and the liquid content of the gas have been observed and reasons for failure for most of the dry wells were established.

The results of the FIS of all wells, 24 in total, have been used to update the charge chance polygons of Central Luconia.

As stated in the pilot study this technique can clearly help us to better understand the hydrocarbon habitat of the Central Luconia carbonate play and it is recommended to analyse more (dry) wells in the future, in order to constrain basin modelling and charge risking further.

This study is part of Shell's continuous effort to use new technology to unravel the basin and charge history to facilitate exploring in a creamed basin.

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