

**IPTC 12666**

## **An Integrated Sedimentological Approach To The Characterisation Of An Incised Valley System: Example From The Miocene Of The Malay Basin**

Andrew James Rees and Peter M Lucas, Furgo-Robertson Ltd.; Carson Young McCants and Stanley F Rae, Petrofac

Copyright 2008, International Petroleum Technology Conference

This paper was prepared for presentation at the International Petroleum Technology Conference held in Kuala Lumpur, Malaysia, 3–5 December 2008.

This paper was selected for presentation by an IPTC Programme Committee following review of information contained in an abstract submitted by the author(s). Contents of the paper, as presented, have not been reviewed by the International Petroleum Technology Conference and are subject to correction by the author(s). The material, as presented, does not necessarily reflect any position of the International Petroleum Technology Conference, its officers, or members. Papers presented at IPTC are subject to publication review by Sponsor Society Committees of IPTC. Electronic reproduction, distribution, or storage of any part of this paper for commercial purposes without the written consent of the International Petroleum Technology Conference is prohibited. Permission to reproduce in print is restricted to an abstract of not more than 300 words; illustrations may not be copied. The abstract must contain conspicuous acknowledgment of where and by whom the paper was presented. Write Librarian, IPTC, P.O. Box 833836, Richardson, TX 75083-3836, U.S.A., fax +1-972-952-9435.

---

### **Abstract**

The characteristic fill and sediment architecture of incised valley systems offer very attractive exploration opportunities, but require a fully integrated approach to fully quantify. Incised valley fill reservoirs are typically associated with rapid base level fall exposing previously deposited marine sediments to subaerial erosion and incision by fluvial processes. The accommodation space this incision creates is typically filled during the subsequent transgression by a complex mosaic of coastal plain and nearshore facies that produces reservoirs confined in time and space, but inherently highly heterogeneous in make-up. The problems imposed by acute reservoir heterogeneity are overcome by integrating traditional sedimentological methodologies with sequence stratigraphic concepts helping to define the allocyclic and autocyclic controls on sedimentation.

This investigation into tropical incised valley and estuarine depositional systems utilises high resolution core description, FMI/OBMI borehole images and conventional wireline logs from seventeen closely spaced wells penetrating the Miocene of the Central Malay basin. Detailed reservoir layering, depositional modelling and facies mapping has been integrated with seismic attribute analysis and static reservoir models to offer a unique insight into the reservoir architecture and properties of this inherently complex facies mosaic.

The resulting sedimentological model has led to improved stochastic modelling and improved reservoir deliverability. Successful marginal field developments in the 21st century mandate a reduction in subsurface uncertainties to mitigate cost over runs and successful commercial exploitation. This integrated approach to subsurface risk reduction has led to the successful commercial exploitation of the Malaysian asset.