

## **Guntong — key challenges and issues in the management of a large complex oil field**

WAN-NAWAWI WAN-MOHAMAD, PATRICK L. COYNE, PAUL V. HINTON,  
JANANI KATHIRMAGOO AND RAZMAHWATA M. RAZALI

Esso Production Malaysia Inc.

Guntong field, located offshore Peninsular Malaysia, is a large anticline covering an area of 50 square km. It consists of 15 vertically stacked, highly heterogeneous reservoirs with two major N-S faults dividing it into three fault blocks; East, Central, and West. Recent geological, 3D seismic, and geophysical studies revealed more complexities in this field.

This paper describes some of the significant reservoir management challenges and the evolution of depletion plans due to the geological, development, and facility complexities.

The East and Central fault blocks were developed in 1985 with a central processing platform, two satellite platforms, and 94 wells. A combination of 5-spot and peripheral waterflood depletion plan was selected and the reservoirs were commingled into two groups. While this was a cost-effective scheme, it added significant challenges in reservoir management and surveillance to optimize waterflood pattern balancing and vertical flow profiles. The interpretation of reservoir wettability has also changed based on special core analysis data and simulation history matching, which resulted in a change of operating pressure strategy.

Production is compressor limited, but many changes have been made to maximize the capacity of the existing equipment. Water injection meters have had a high failure rate. While a long-term solution is being sought, portable clamp-on meters have provided the necessary surveillance data.

The West fault block was developed in 1995 with 44 wells and gas injection scheme. Reservoir compartmentalization presents significant challenges in maximizing gas injection effectiveness.

Various studies are underway to further increase production and reserves, including workovers, infill drilling, and facilities optimization.