

Application of Integrated Reservoir Analysis to Optimize Development Plan

S.W. Wang, SPE, B. Shivers, SPE, Y. Setiawan, J. Inaray, SPE, I. Harmawan, SPE, and Y. Fidra, SPE,
UNOCAL INDONESIA Co.

A study was carried out on the West Seno Field in Indonesia to address two objectives:

1. Build a 3D simulation to study the potential of secondary recovery with water or gas injection.
2. Build an IPM model to study the optimal workover strategy. This was for the West Seno field in Indonesia which was the first deepwater development project in the area which also happened to be multi-layered. At the time there were two active wells: a downdip D5 and an updip D6.

The study for each of these options was split into three parts:

1. Material balance model created (MBAL)
2. Pressure transient testing
3. Development Plan (GAP) to account for the production with respect to the falling pressure over time.

The reservoir size and STOIP had been evaluated using various methods and successfully matched to the reservoir models and the network in GAP increasing the confidence in the output results of the possible development plans. The possible development plans were as follows:

1. Moving either D5 or D6 uphole to develop shallower horizons
2. Potential for waterflooding to increase the ultimate recovery
3. Moving one well uphole resulting in commingled production with the current horizon.

Having followed the above plans, the conclusion was that secondary recovery allowed for the highest recovery and NPV when commingling for some of the layers was allowed and plugging for some pay was carried out.