

VIC/TAS Branch

Luncheon talk to be presented by Bob Sneider - Esso Distinguished Lecturer - to PESA VIC/TAS Branch meeting on Tuesday, August 12, 1997

"Reservoir Characterisation of Mature Fields; Rejuvenating Very Old Fields Profitably"

The last decade has seen an explosion of new technology in exploration and production. The use of 3D and improved 2D seismic, horizontal and radial drilling, application of sequence stratigraphy on a field-scale, stochastic reservoir modelling are just a few of the advances. The new technology coupled with the revolution in computer capability has helped to improve reservoir characterisation and reservoir management. Many field examples demonstrate improved recovery, reserve additions and increased profitability from better characterisation and management of reservoirs.

What can be done to improve performance in very mature fields? What new technology can be applied profitably to these very old fields? Also, what can geoscientists and petroleum engineers learn from studies of these old fields about what is important to characterise?

Some answers to these questions are from a search in several North American basins for large, low risk reserves in fields 35 to 65 years old. The fields studied include those producing by (1) primary recovery without secondary recovery potential; (2) primary recovery with supplemental recovery potential; and (3) those undergoing waterflooding. We found that recognition of flow barriers, reservoir compartments controlled by subtle structure and stratigraphy, detailed understanding of pore space connectivity and the recognition of very low resistivity reserves are of primary importance. Large volumes of reserves are found in previously undetected reservoir compartments and in rocks thought to be non-reservoir or wet.

Forty-six very mature fields, purchased during a 15 year study, had an average after tax rate of return of 21%. New reserve additions were 5 to 18 percent of the cumulative reserves produced. The addition of proved and probable reserves range from a few million barrels of oil equivalent (BOE) to over 200 million.