SEAPEX Exploration Conference 2007
Orchard Hotel, Singapore
24th – 26th April 2007

Day: **Thursday 26th April**
Session: **New Technical Methods Session**
Time: **1130 – 1200 hrs**

Reservoir Recovery Factor 40-50% ?! Time Lapse Seismic (4D) will pay back 10-20 times its cost even at $30 a barrel

Ian Jack
Consultant (BP, retired)

In the early days of 3D seismic (in the late 70's through to the early 90's) it was always difficult to justify using this "new technology" -- the industry tends to be conservative, and commercial case history successes attributed to 3D seismic technology were slow in being published. By the early 2000's, however, if proposing a 2D seismic survey, then during the approvals process one would expect to have to justify not acquiring 3D seismic data.

4D seismic has had a slightly faster take-up. We should ask ourselves why approximately 80% of all seismic work in the North Sea is shot and processed for time-lapse (4D) purposes – in fact for the major oil companies in the North Sea, 4D represents over 90% of their work program in that area.

We should also ask ourselves why this situation came to pass in the late 90's, even when the oil price was below $25 per barrel.

The answers should be no surprise – most of the reservoirs in the North Sea were in decline by the late 90's, and those people who were charged with maximizing the flow rates and/or the reservoir recovery factors began to use technologies such as 4D which was beginning to make a significant impact.

At about the same time, it gradually became apparent that 4D could probably make a greater contribution if applied early in the life of a field -- even extended well-tests produced useful 4D results over periods of just a few months, and these could show up some of the important architecture of the reservoir.

Commercial case histories for 4D appeared relatively quickly compared to 3D and assisted the take-up of the method. Several of these will be presented in detail, together with a review of the current state of the science including “life of field” systems which are producing several “pictures” of the reservoir in a 12 month period, almost allowing a “movie” of the changes in the reservoir. The technology is evolving but its directions are clear and will be described in this paper.