

The Time Has Come for Time-lapse Seismic

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Summary

In the last ten years, time-lapse seismic has advanced from being a research topic into a reasonably mature technology, and it is now being used routinely for reservoir management in several parts of the world. In 2005, the majority of “4D” has been recorded on clastic reservoirs offshore using repeat towed streamer surveys, and the technique is widely recognized as being commercially valuable in those areas.

Over the last 3 or 4 years we have gained a much better understanding of the important parameters and requirements for rock properties, modeling, repeatability, and seismic imaging. Thus, in this time frame, the method has seen successful trials in more difficult regimes such as onshore carbonates. Additionally, since the understanding of its commercial value has matured, more ambitious schemes have appeared such as permanently emplaced systems both onshore and offshore.

This paper will review the most recent developments from a technical standpoint. However, the most important topic for an emerging technology is a discussion of commercial value, so this will be covered in detail.

One conclusion which will be drawn is that, analogous to the emergence of 3D technology in its early stages in the 1980’s, the commercial value of time-lapse seismic is under-rated. The oil industry is noted for its slow and conservative take-up of new technologies and “4D” is no exception.