MULTILATERAL WELLS

Lateral Thinking Drives Lower Cost | May 2012

In a world where easy-to-access hydrocarbons are becoming rarer, the technical capability to exploit difficult-to-access reservoirs is increasingly a key factor in a project's viability.

Woodside's capability with multi-lateral horizontal wells was crucial on the Vincent field development. It reduced capital expenditure whilst maximising reservoir contact.

We took a progressive approach in order to overcome the challenges of the Vincent field. A key enabler was development of the field with multilateral wells to improve economics whilst maintaining recovery.

Woodside was the first operator in Australia to drill and complete multi-lateral wells and the first operator in the world to drill large-bore 10 ¾" multilaterals.

The Vincent field is in shallow water, the reservoir's oil column is relatively thin and spread over a wide area, the oil is highly viscous and sand control is an issue.

Woodside's drilling team positioned wells with pin-point accuracy in a very narrow envelope over distances of up to 2.5km in the sandface. Added to that, highly viscous oil doesn't flow easily which means drilling multiple wells to maximise oil recovery across the reservoir.

Technical Challenges:

Although technically challenging, the most cost-effective means is to drill the initial subsea well (motherbore) and then branch off a second well path (lateral bore) within the reservoir using a whipstock.

The two bores are then connected with a multilateral junction (RapidX) and then the upper completion and subsea tree are installed.

Commercial Benefit:

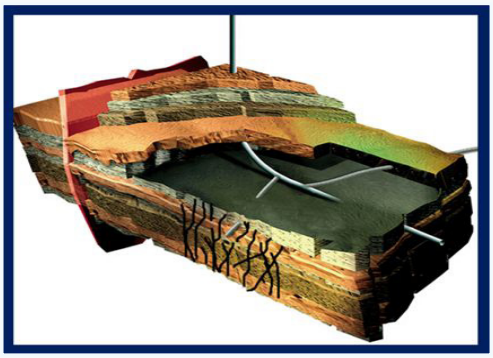
Adding a lateral bore onto an existing new well requires an incremental 30% drilling and completion capital expenditure. Creating a multilateral well also allows for the elimination of a subsea tree and upper completion for the additional lateral.

For full field development on Vincent (as shown in the diagram below) 31 laterals were drilled. However, only 13 upper completions and 13 subsea trees were required. By utilising multilateral wells in the way described Woodside (and its joint venture partner Mitsui) reduced costs by $1b.

Mulitlateral Technology has proven to be a useful enabler to unlock reserves in future developments for Woodside.

QUICK FACTS

- Vincent is the first known subsea development (worldwide) entirely based on a multilateral system.
- First use of subsea multilateral technology and techniques in Australia.
- Woodside has now installed 5x TriLaterals and 8x BiLaterals.
- Vincent wells are drilled up to 2.5km horizontally (extended reach drilling) through challenging unconsolidated sands within a +/- 1m drilling window.



A reservoir section illustrating a standard well to multilateral well