OVERVIEW

Apache Energy Ltd., an Australian operating subsidiary of Apache Corp., wanted to develop the Van Gogh field, a remote subsea location northwest of Perth along the Ningaloo Marine Park, which protects an environmentally sensitive fringing reef off Western Australia's coast. The company decided to use multilateral technology for the first time to increase reservoir exposure while minimizing the project’s developmental footprint and any disturbances to the seabed. To meet Apache Energy’s needs, Halliburton deployed the FlexRite® isolated tieback multilateral system, along with an integrated package of directional drilling and formation evaluation services for the subsea field development project. This first subsea multilateral project and first TAML Level 5 installations for Apache Energy helped increase reservoir exposure while lowering costs.

CHALLENGES

The Van Gogh field is very remote, requiring at least 18 hours by truck and 16 hours by boat to reach the rig from the operations base. Additionally, the North West Shelf of Western Australia is commonly struck by cyclones during the summer months. As the cyclone season compressed the schedule, Apache used two semisubmersible rigs operating concurrently within approximately 1.5 kilometers (1 mile) of each other. Running two rigs simultaneously in a fast-paced operation required a high level of project management and coordination to ensure that quality equipment and services were provided in a timely manner.

Another challenge to the development was the unconsolidated thin reservoir sands that required trajectory control to meet the 1-meter (3-ft) true vertical depth (TVD) directional tolerances. Weight transfer was also an issue due to the shallow TVDs in comparison to the measured depth (MD); for example, a 1,300-meter (4,265-ft) TVD junction depth was at MD up to 2,000 meters (6,562 ft).

Also, the extremely abrasive formation required parts of the multilateral equipment that typically last five to seven wells to be replaced for every run. Apache Energy wanted to continuously increase overall drilling rates, while maintaining the tight TVD tolerances presented in the highly permeable sands.

SOLUTION

FlexRite® isolated tieback multilateral system, along with an integrated package of directional drilling and formation evaluation services

RESULTS

Installed eight FlexRite multilateral systems from two semisubmersible floating rigs, delivering 16 lateral production wellbores

Operator increased reservoir exposure while using limited additional rig time, reducing both capital and operating expenses

FlexRite system allowed the operator to reduce the well count by half and to put the reservoir on line for a much lower capital expenditure

SOLUTION OPTIMIZES OPERATIONS FOR INCREASED EFFICIENCY IN ENVIRONMENTALLY SENSITIVE AREA

VAN GOGH FIELD, WESTERN AUSTRALIA

FlexRite® System Increases Reservoir Exposure While Reducing Risk and Capital Expenditures

SOLUTION OPTIMIZES OPERATIONS FOR INCREASED EFFICIENCY IN ENVIRONMENTALLY SENSITIVE AREA

VAN GOGH FIELD, WESTERN AUSTRALIA
SOLUTION

Apache Energy selected the FlexRite isolated tieback multilateral system, along with an integrated package of directional drilling and formation evaluation services. The FlexRite system features an aluminum-wrapped pre-milled window to allow easy drill-out producing no steel debris, thus reducing costly cleanout trips and minimizing risk in subsea applications. The high-strength junction is especially designed to accommodate extremely long lateral screens for increased reservoir exposure and a maximum flow area for high production rates.

Classified as an isolated TAML Level 5 multilateral system, the FlexRite system provides hydraulic pressure integrity at the junction, helps to eliminate sand production, and allows isolation and flow control of the lower main bore and lateral. It has a permanent downhole latch coupling reference for depth and orientation control.

The project was very fast paced, as hole sections ranged between 800 meters to 2,200 meters (2,625 ft to 7,218 ft) MD; and rates of penetration (ROPs) averaged 35 meters (115 ft) per hour. There was very little setup and maintenance time between trips; in many cases, the equipment was stripped down, inspected, redressed, tested, and sent back out to the rigsite within 12 hours (regardless of time of day or day of the week), requiring a high level of dedication and attention to detail.

RESULTS

Within a six-month span, Halliburton installed eight FlexRite multilateral systems from two semisubmersible floating rigs, delivering 16 lateral production wellbores for the subsea field development with no major injuries, accidents, or environmental incidents.

This was the first subsea multilateral project and first TAML Level 5 installations for Apache Energy. With these installations, the operator increased reservoir exposure while using limited additional rig time, reducing both capital and operating expenses. The proven FlexRite system allowed Apache Energy to reduce the well count by half and to put the reservoir on line for a much lower capital expenditure.