DEEP WATER

CASE STUDY

Isolation Barrier Valve Technology Helps Optimize Operating Efficiency and Run Reliability During Shell Project

FS2 FLUID LOSS ISOLATION BARRIER VALVES REMOTELY OPENED A RECORD 94-KILOMETERS FROM PLATFORM

TRINIDAD AND TOBAGO

CHALLENGES

- Long-distance subsea tiebacks via 94 and 43-kilometer pipeline
- No previous experience beyond 27 kilometers
- Potential delay to first gas due to NPT

SOLUTIONS

- FS2 fluid loss isolation barrier valves

RESULTS

- FS2 valves remotely opened from a record distance of 94 kilometers
- Lower and upper completions installed successfully
- Costs associated with rig intervention eliminated

OVERVIEW

The Colibri development project comprises the Cassra and Orchid fields, where two subsea wells drilled in each field tie back to an existing platform via 94 and 43-kilometer (58 and 27-mile) pipeline, respectively. Shell planned to install upper and lower completions in the four subsea wells, which necessitated dual barriers that can operate reliably in the challenging deepwater environment. Halliburton recommended the FS2 fluid loss isolation barrier valve (IBV) to provide reservoir isolation and fluid loss control prior to running the upper completions. All four FS2 IBVs installed in the Cassra and Orchid wells remotely opened successfully from 94 and 43 kilometers — a remote cycling record for the FS2 valve.

Remote activation distance record:
FS2 fluid loss isolation barrier valves cycled open a record
94 kilometers from platform

CHALLENGE

The 94-kilometer distance between the Cassra field wells and the host platform was an initial concern due to the lack of previous experience cycling isolation barrier devices more than 27 kilometers (17 miles) away. Shell wanted a tested and proven reliable fluid loss IBV to avoid costly rig intervention and associated non-productive time (NPT) that could delay first gas. To address this concern, Shell considered several alternative options before ultimately selecting the FS2 IBV.

SOLUTION

Halliburton collaborated with Shell to design a completion solution that addressed the challenges encountered during this project. Thorough project planning was crucial to operation success, beginning with detailed design reviews, peer reviews, risk assessments, critical well reviews and meetings for both the upper and lower completions. The four completion designs and operational procedures incorporated best practices and lessons learned from previous Shell and Halliburton deepwater operations.

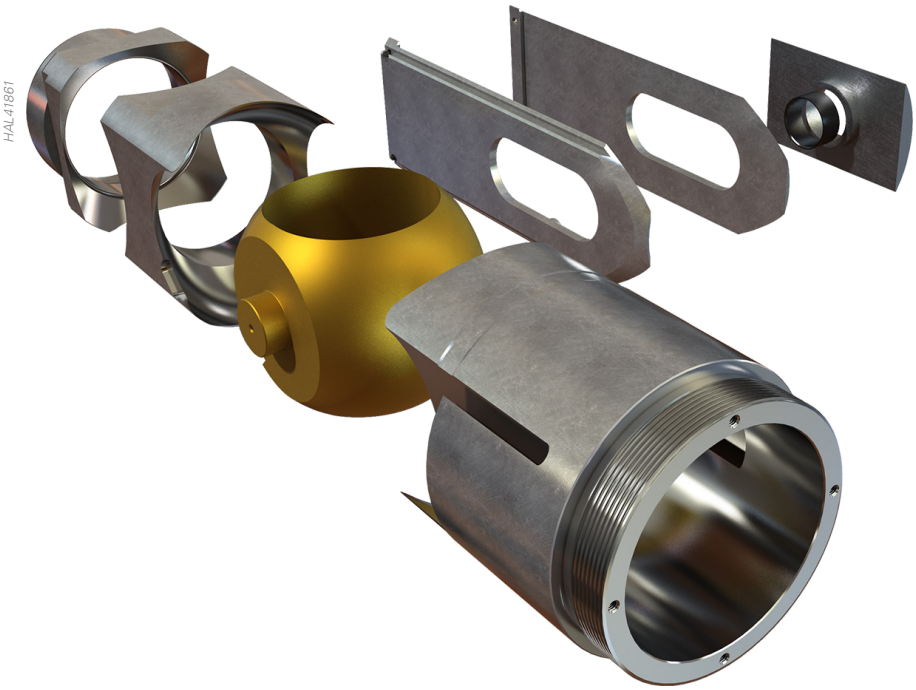
To isolate the reservoir during the running of each upper completion, Halliburton recommended its field-proven FS2 IBV. As part of the solution, Halliburton presented the FS2 IBV's extensive successful run history and the proven ability to cycle the valve remotely from long distances following long-term suspension.

The FS2 valve meets ISO 28781 V1 Q1 Type CC requirements and provides a bidirectional, testable barrier for the lower zone by closing the ball valve with a collet shifting tool connected to the end of the service tool string. Additionally, the enhanced debris-tolerant design helps ensure valve functionality in the event of inadequate well conditioning during and after installation.

RESULTS

Shell installed the lower and upper completions in all four wells as planned. The FS2 valves remained suspended for approximately 12 months before cycling open with 3,500-psi cycle pressure. All four FS2 valves opened remotely from record distances of 43 and 94 kilometers, respectively.

This collaborative solution provided a reliable interventionless wellbore completion barrier that helped minimize production delays and significantly reduced overall costs, which ultimately maximized the asset value for Shell.



FS2 Fluid Loss Isolation Valve

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