Advanced Downhole Testing Combination
Saves Client 4 Days of Rig Time

Quartet system efficiently tests high gas rate wells during exploration testing

**CHALLENGE**
Test wells more efficiently using a single-trip downhole testing solution and real-time data transmission.

**SOLUTION**
Use the Quartet high-performance downhole reservoir testing system to test wells in one run; enable real-time decisions by using the InterACT connectivity, collaboration, and information system.

**RESULTS**
Met all test objectives while saving the client 4 days of rig-up and rig-down time.

**Case Study**

“The use of the Quartet system helped Cardon IV safely achieve our test objectives. The Quartet system is certainly a winner . . . it is our intent to use the same string configuration in the future.”

Arno Vervoort
Well Test Coordinator
— Cardon IV

**Single-trip efficiency needed for the testing of exploration wells**
Cardon IV, a joint venture between Repsol and ENI, needed to safely and efficiently perform a series of downhole tests on its high gas rate wells to determine the reservoir properties of a field in the northwest section of the Gulf of Venezuela. Initial plans were to drill two exploration wells with the possibility of adding three additional wells.

Operations required premium connections for the downhole test string. However, drill collars with premium connections were not available in-country and would have to be imported—an expensive option. Another challenge was to eliminate the use of a permanent packer to avoid three separate trips for each test. The objective was to perforate a 500-ft interval underbalanced and perform single-trip reservoir testing.

To reduce the likelihood of a leak, the client wanted a minimum amount of tools to be run in the test string, which would include independently activated downhole samplers. Finally, to help decide the optimal time for flow and shut-in periods, downhole pressure data transmission had to be delivered in real time to client offices off-site.

High-quality pressure measurements acquired using CQG gauges were transmitted in real time to the client.
CASE STUDY: Quartet system efficiently tests high gas rate wells during exploration testing

The Quartet system’s advanced string configuration enabled the client to isolate using the CERTIS* system, control with the IRDV, measure with CQG gauges, and sample using SCAR* sampling—all in a single run, saving 4 days of rig time.

Combination of field-proven technologies provides optimal testing solution

Cardon IV chose Schlumberger to perform the downhole tests using the Quartet high-performance downhole reservoir testing system—a combination of the CERTIS high-integrity reservoir test isolation system, the IRDV intelligent remote dual valve, the CQG crystal quartz gauge, and SCAR inline independent reservoir fluid sampling.

The CERTIS isolation system was selected due to its ability to deliver single-trip isolation and retrieval without the need for drill collars and slip joints. For underbalanced annulus downhole testing, the CERTIS system was the ideal choice because of its permanent packer capabilities and its floating seals to compensate for changes in pressure and temperature.

The IRDV dual valve was selected to achieve the desired underbalance for perforation using a circulating valve and to control downhole flow using a tester valve. And combined with the other Quartet technologies, the IRDV significantly reduced the number of tools in the downhole test string.

The Quartet string also incorporated the CQG gauges, and to complement the gauges’ high-quality pressure measurements, real-time data acquisition and transmission was made possible using the InterACT system. With this combination of technologies, downhole pressure data could be sent immediately to the client.

The SCAR sampling system was selected to complete the single-trip test string and to acquire reservoir-representative samples at downhole conditions. The SCAR setup included a CQG gauge to compare the pressure drop in the samplers at the moment of activation.

Advanced configuration saves 4 days of rig time

Using the Quartet system, Cardon IV was able to

- test its high gas rate wells with single-trip efficiency
- convey 50 MMcf of gas to the surface using premium connections
- acquire downhole fluid samples at reservoir conditions
- determine a downhole production performance profile
- monitor well performance in real time
- re-open the well after being killed
- obtain high-quality data for accurate reservoir characterization.

In addition, Cardon IV saved a combined total of 4 days of rig time with the help of the Quartet system’s versatile single-trip wellbore isolation, underbalance pressure control, real-time pressure measurement, and efficient downhole sampling.

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