

# Repsol Sinopec Uses Wireless Telemetry to Communicate with Gauges Installed Below the Packer

Signature HP gauges and SenTURIAN E&A system enabled by Muzic wireless telemetry provide critical data in real time during all phases of ultradeepwater job

## CHALLENGE

Acquire real-time pressure transient well test data in an ultradeepwater environment while ensuring continuous communication with gauges installed below the packer.

## SOLUTION

- Install Signature HP\* high-pressure quartz gauges enabled by Muzic\* wireless telemetry below the QUANTUM MAX\* HPHT gravel- and frac-pack packer to transmit real-time data during all stages of the well test.
- Run the SenTURIAN E&A\* well test subsea landing string electrohydraulic operating system enabled by Muzic telemetry to confirm downhole equipment functionality and monitor downhole pressure measurements in real time.

## RESULTS

- Provided real-time pressure and temperature data wirelessly during all phases of the operation, including cleanup, main flow, and buildups.
- Saved 73 h of rig time and reduced costs.
- Completed first commercial application of the SenTURIAN E&A system enabled by Muzic wireless telemetry.



## Obtain high-quality data during a deepwater well test

When operating offshore Brazil, Repsol Sinopec Brazil S.A. wanted to acquire real-time pressure transient well test data in an ultradeepwater environment (7,011-m well, at 2,840-m water depth, with 30.5° maximum deviation) while ensuring real-time wireless communication with gauges installed below the packer.

## Monitor downhole pressure using Muzic wireless telemetry

Schlumberger engineers recommended Repsol Sinopec run Signature HP high-pressure quartz gauges enabled by Muzic wireless telemetry installed below the QUANTUM MAX HPHT gravel- and frac-pack packer to transmit real-time pressure and temperature data during the well test. Signature HP gauges provide valuable pressure and temperature information under the most extreme HPHT conditions.

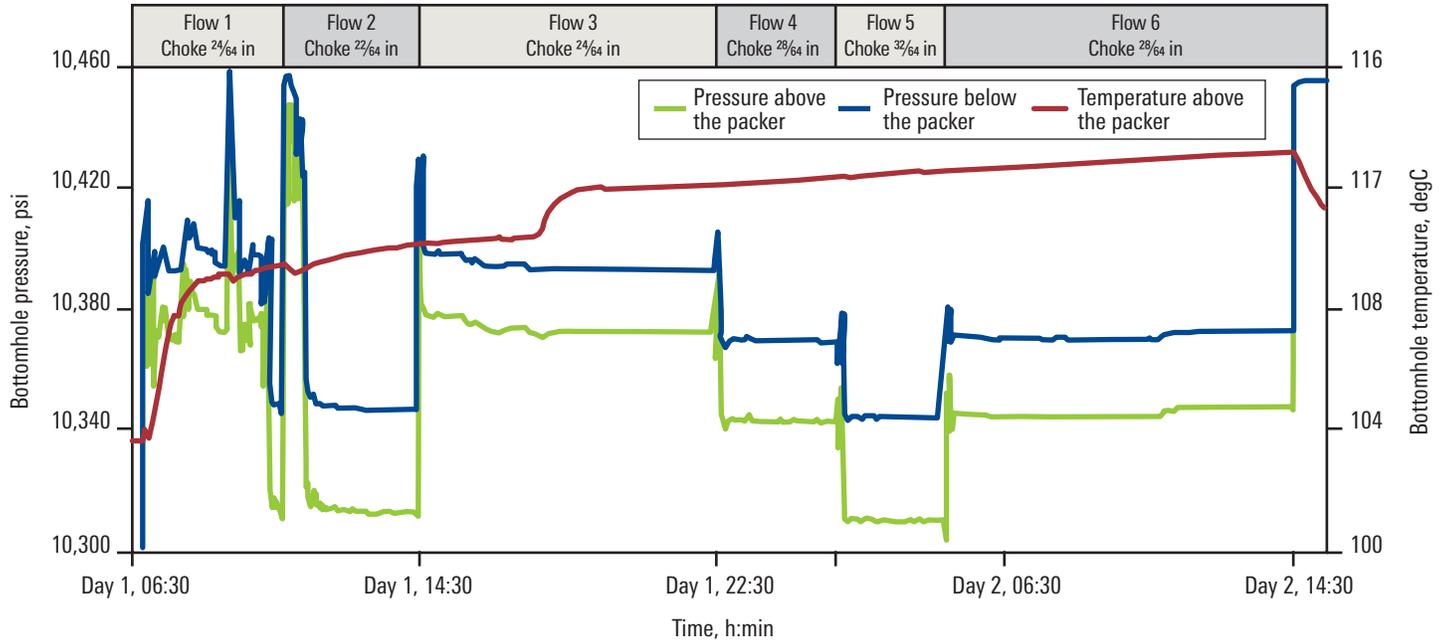
**“We achieved maximum efficiency during the flow and buildup periods using real-time downhole data to accelerate management decision making, which saved rig time and costs.”**

Magdy A. Rezk, Laerte Duque, and Paula Castineira  
Well Testing Team  
Repsol Exploration



*Fallout-free, smokeless combustion of well effluent produced during well testing.*

**CASE STUDY:** Repsol Sinopec uses wireless telemetry to communicate with gauges installed below the packer, offshore Brazil



Real-time downhole conditions for enhancing operational efficiency and safety.

**Rig-Time Savings: Planned Versus Actual**

Period	Planned, h	Actual, h
Cleanup	24	31
First buildup	30	17
Main flow	72	32
Final buildup	66	39
<b>Total</b>	<b>192</b>	<b>119</b>

Schlumberger also recommended the SentURIAN E&A well test subsea landing string electrohydraulic operating system designed to run with Muzic wireless telemetry and subsea gauge carriers. This combination enables verification of subsea and downhole equipment functionality and integrity as well as monitoring of downhole pressure and temperature. The SentURIAN system is the world’s first in-riser system designed and certified in accordance with IEC 61508 SIL 2 reliability specifications for safety-related systems. This provides reliable well control regardless of umbilical length, even under increased annulus pressure associated with ultradeepwater deployments.

**Provided rapid wellbore isolation using electrohydraulic landing string system, saving 73 h of rig time and costs**

The Signature HP gauges and Senturian E&A system—both enabled by Muzic wireless telemetry—allowed Repsol Sinopec to obtain real-time pressure measurements while monitoring and controlling the downhole reservoir test. During all phases of the operation, wireless communication was maintained with gauges installed below the packer, allowing for real-time pressure data verification and better-informed decision making.



Image courtesy of Ocean Rig.

Ocean Rig Mylos designed for ultradeepwater drilling operations at water depths from 500 m to 3,650 m.

Communication was established between the subsea repeater and surface using Muzic wireless telemetry and the Senturian E&A system’s electrical umbilical cable. The SentURIAN E&A system and SenTREE 3\* subsea test tree provided a rapid-response well control solution for Repsol Sinopec’s testing campaign. When the wellsite was tested prior to deployment, the SentURIAN E&A shut in and unlatched the SenTREE 3 tree in 8 seconds, narrowing any concerns regarding emergency well control at such great water depths.

Real-time downhole pressure monitoring during direct circulation helped the operator confirm the correct underbalance before activating the eFire-TCP\* tubing-conveyed perforating electronic firing head. All wireless data were communicated in real-time through the InterACT\* global connectivity, collaboration, and information service.

[slb.com/Quartet](http://slb.com/Quartet)



\*Mark of Schlumberger. Other company, product, and service names are the properties of their respective owners. Copyright © 2017 Schlumberger. All rights reserved. 17-TP-135686