



Weatherford®

REAL RESULTS

First 12 *m*POD™ Gauge Systems with CS7X Technology Successful at Monitoring and Logging Subsurface Data

Objectives

- Identify and install a comprehensive subsurface monitoring system, horizontal tailpipe completion design, and the surface instrumentation for historical data retention and communications to existing SCADA for an existing progressing cavity pump (PCP) well.
- Use subsurface data to assist in defining the free-gas entry point, the productivity index (PI) evaluation at high drawdown, and the friction evaluation of flowing production fluids at different gas/oil ratios (GORs) and diluent injection rates.
- Gather data for reservoir behavior research in which final determination of overall production contribution can be compared to the theoretical model.

Results

- Weatherford provided project management and engineering, including torque and drag surveys, to optimally discern the preferred placement of the downhole completion string and ensure successful conveyance of the tailpipe within a 7-in. horizontal liner. The entire system configuration, packaging, training, and installation engineering were supplied as well to ensure the complete solution.
- Weatherford installed 12 *m*POD multipoint digital sensors to monitor pressure and temperature. The first sensor was installed at 5,250 ft (1,600 m) total measured depth (TMD), and the following 10 sensors were spaced, according to reservoir requirements, throughout a 7-in. liner, conveyed on a 2 3/8-in. tubing string complete with low-profile gauge mandrels and splitter assemblies. The 12th sensor was located in the production string to monitor the intake pressure and temperature at the pump.



The *m*POD sensor transmits a proprietary protocol when addressed, which allows for multiple gauges to be powered and communicate on the same single-conductor cable.

Location

San Diego de Cabrutica, Venezuela

Well Type

Onshore oil wells

Production System

Progressing cavity pumps

Products/Services

- Reservoir monitoring services
- *m*POD multipoint digital sensors
- CS7X wellsite manager

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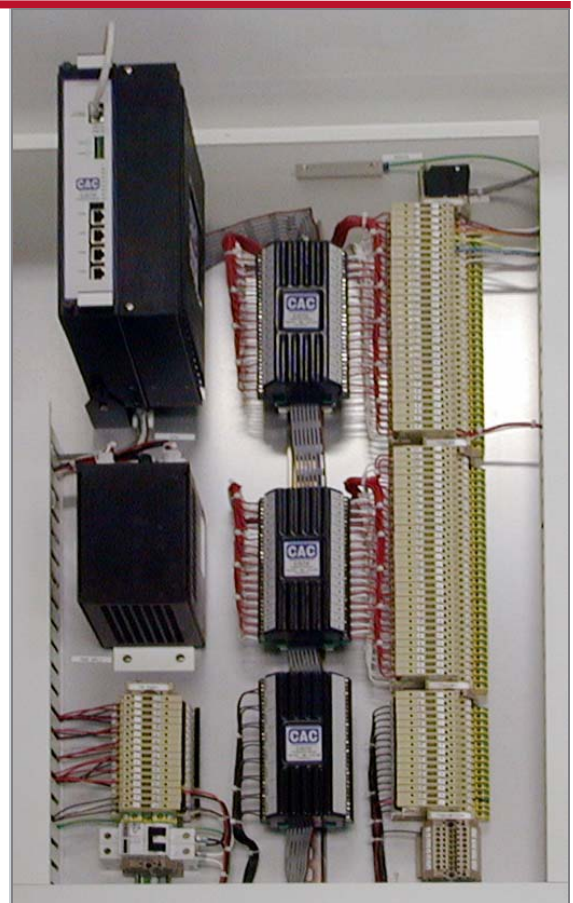
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Results (continued)

- Using its proprietary gauge transmission protocol, Weatherford assigned unique addresses for each downhole sensor. The information from the sensors was communicated to the surface through single-conductor, 1/4-in. tubing-encapsulated conductor (TEC). A CS7X wellsite manager was installed at the surface to monitor and log the data from the 12 *m*POD sensors.

Value to Client

- Using Weatherford's proven CS7X technology with a custom configuration to read up to 12 *m*POD gauges provided the client with reliable and accurate data transmission to the surface interface.
- This application was not the first multisensor system installed by Weatherford in Venezuela; however it was the first 12-gauge system installed in Venezuela as well as the first with this quantity of gauges, of any brand, installed in a horizontal completion, in the world.



CS7X wellsite manager monitors and logs subsurface data from the *m*POD gauges.

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