

# Operator in Southern Mexico Doubles Oil Production in Low-Pressure Reservoir Using ACTIVE Services

Real-time data guides new interval perforation and matrix stimulation and minimizes deferred production

## CHALLENGE

- Open and stimulate new intervals with minimal impact on the lower producing interval.
- Limit deferred production and minimize risks associated with low reservoir pressure.
- Confirm the effectiveness of the perforating sequence.
- Obtain downhole information to guide and optimize the subsequent matrix stimulation.

## SOLUTION

- Employ the following ACTIVE\* CT real-time downhole coiled tubing services:
  - ACTIVE OptiFIRE\* CT real-time selective perforating and activation system to perforate two new intervals without the need for fluids or shutting in the well.
  - ACTIVE Matrix\* CT real-time stimulation and conformance service to acquire live downhole measurements and optimize the stimulation treatment.
  - ACTIVE Lift\* CT real-time nitrogen lifting service to improve fluid efficiency and CT nitrogen lift operation time.

## RESULTS

- Doubled oil production.
- Controlled water production.
- Minimized deferred production.

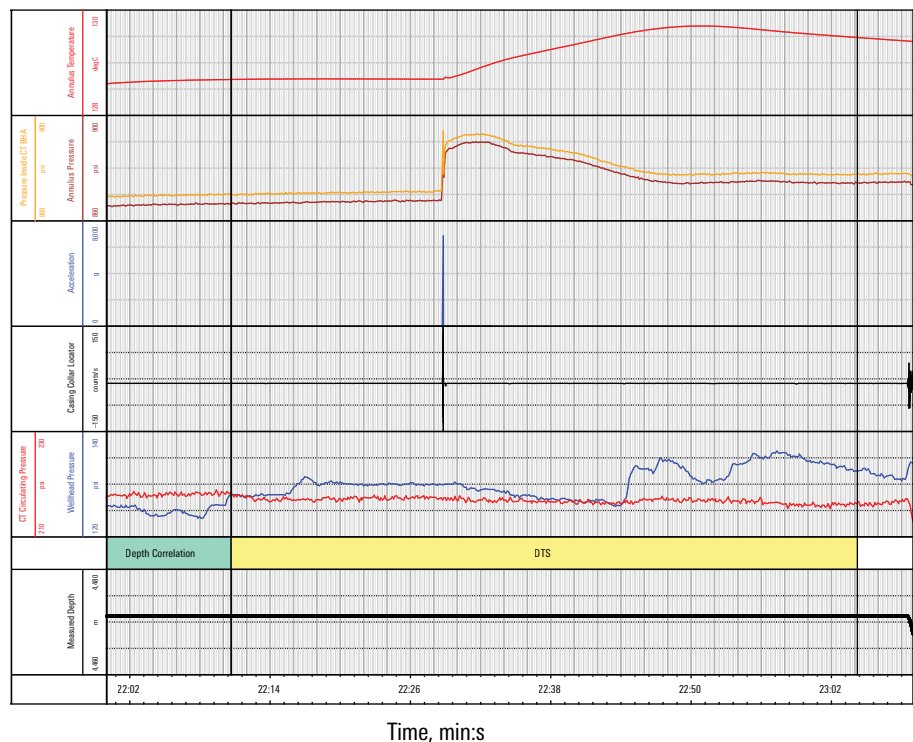


## Increase oil production in mature carbonate well

An operator in southern Mexico wanted to perforate and stimulate new intervals in a well in a mature carbonate reservoir without impacting an existing producing interval that had some water content. Because a prolonged shut-in would not only generate a loss of revenue but would also necessitate a long nitrogen lift to restore production to this deviated, low-pressure well, the operator wanted to strictly limit deferred production. The operator also sought robust downhole data to guide the matrix stimulation.

## Use ACTIVE services to acquire real-time data, perforate new intervals, and optimize stimulation

Schlumberger recommended using real-time data monitoring and precise perforation capabilities to revive the operator’s mature gas-lifted well. The ACTIVE OptiFIRE system was used to perforate two new intervals without the need to shut in the well or pump a fluid that could impair the existing or newly opened intervals.



Real-time confirmation of downhole detonation, with variations in downhole annular pressure and temperature indicating the effective opening of a new interval.

## CASE STUDY: ACTive services double oil production in low-pressure reservoir, Mexico

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Because no fluid was pumped to trigger the downhole detonation, the ACTive OptiFIRE system was able to monitor the true pressure and temperature responses of the well throughout the firing sequence by using sensors in the BHA and distributed fiber-optic technology. DTS measurements—along with downhole pressure and temperature, casing collar locator, and accelerometer data from the BHA—were instrumental in confirming the proper opening of new intervals. The data was also used to determine which interval to stimulate first to optimize the effectiveness of the subsequent stimulation treatment.

The flow port in the system enabled stimulating the newly opened intervals immediately following the last perforating event without the need to pull out of hole to change the BHA. Using ACTive Matrix service improved stimulation effectiveness because the stimulation fluids could be applied directly along the new interval instead of requiring displacement of the working fluids typically used for perforating heads. ACTive Lift service contributed

to more efficient, controlled well production restoration through the use of continuous wellbore pressure and temperature monitoring.

### **Doubled oil production while maintaining control of water production**

Following perforation and stimulation of the two new intervals, production immediately doubled. This success was a result of acquiring advanced downhole and distributed data to confirm effective opening of the new intervals and to optimize the subsequent targeted stimulation treatment. Water production remained controlled, and the well continued to flow except for a few hours during the stimulation treatment, effectively minimizing the extent of deferred production.

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