

HeatWaveSM Extreme Service Logs 22 Ultrahigh-Temperature Wells with Zero Failures and Zero NPT, Saves Chevron \$4 Million

Objectives

- Acquire reliable formation-evaluation data while drilling multiple wells in the Gulf of Thailand, where bottomhole temperatures exceed 347°F (175°C).
- Decrease operational time by developing a new method for logging ultrahigh-temperature wells without the need for additional trips to cool the bottomhole assembly (BHA).

Our Approach

- Over a period of 9 months, Weatherford and Chevron jointly developed the HeatWave Extreme (HEX) service, a high-temperature logging-while-drilling (LWD) solution capable of withstanding temperatures of 392°F (200°C) for up to 200 operating hours. The LWD tools can endure exposure to temperatures of 410°F (210°C) for up to 4 operating hours.
- Weatherford deployed the HEX service in 22 high-temperature offshore wells operated by Chevron. The high-temperature-rated sensors in the HEX assembly operated for a total of 1,650 hours and acquired real-time and recorded neutron porosity, bore/annular pressure, gamma, and integrated directional sonde data.
- Weatherford drilled a total of 150,282 ft (45,806 m), including 18,844 ft (5,744 m) in which temperatures exceeded 347°F (175°C). They did not need to employ any time-consuming temperature-mitigation efforts, such as reducing rpm, controlling the rate of penetration, or circulating to cool the BHA.
- The team completed the entire 22-well drilling campaign in 25 runs and 1,218 drilling hours with zero tool failures, zero blind runs, zero safety incidents, and zero nonproductive time (NPT).

Value to Client

- By avoiding BHA-cooling trips, Chevron saved approximately 223 hours of rig time.
- The HEX service increased efficiency across the operation, which enabled Weatherford to drill and log each well in an average of 6.2 days.
- The directional LWD data provided by the HEX service informed Chevron's well-placement and completion plans in the field. Without complete LWD data, Chevron would have needed to make a subsequent gyro-survey run.
- The total cost savings, including rig time and the expense of a gyro-survey run, are valued at approximately US \$4 million.



Weatherford and Chevron personnel examine the high-temperature-rated LWD tools used in the jointly-developed HEX service.

CLIENT

Chevron

LOCATION

Gulf of Thailand

WELL TYPE

High-temperature, offshore, gas

NUMBER OF WELLS

22

HOLE SIZE

6-1/8 in.

MAXIMUM STATIC BOTTOMHOLE TEMPERATURE

415°F (213°C)

MAXIMUM DRILLING TEMPERATURE

383°F (195°C)

TOTAL DISTANCE DRILLED

150,282 ft (45,806 m)

PRODUCTS/SERVICES

HeatWave Extreme service

