



# Weatherford®

## REAL RESULTS

### Reverse-Circulation Jet Pump Lifts Production Rates of Heavy, Thick Oil to Profitable Levels

#### Objectives

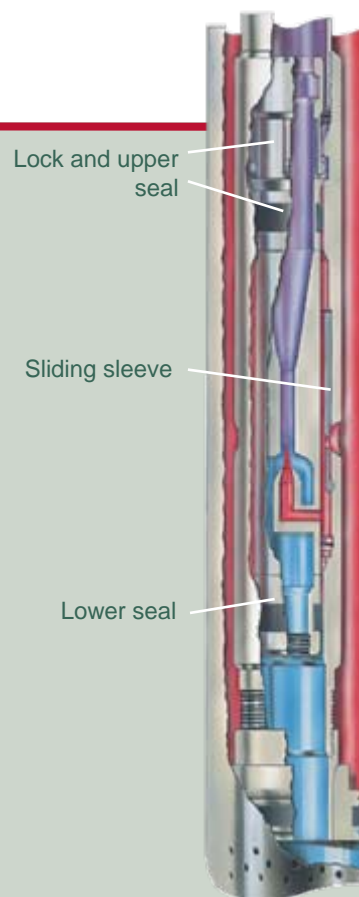
- With a gravity of 8 API and a high viscosity and high pour point, the oil turned almost solid in the tubing string and could not be brought to the surface in commercial quantities—in spite of the field being steam flooded. The challenge was to keep the oil sufficiently heated to increase flow rates to profitable levels.

#### Results

- Using its reverse-circulation jet pump with 200°F (93°C) water as the power fluid, Weatherford lowered the viscosity of the produced fluids from approximately 100,000 to 800 cp.
- Reverse circulation of the hot water injected down the casing/tubing annulus increased returns up the tubing string and provided a thermal barrier for the tubing string, which minimized heat loss from the fluids.
- The pump was located in a sliding sleeve already installed in the tubing string, eliminating the need for tripping the tubing to install a bottomhole assembly (BHA) for a standard jet pump.

#### Value to Client

- Platform wells are producing at profitable rates.
- The wireline-installed pump saved the cost of tripping the tubing to install a standard jet pump.
- The thermal barrier eliminated the need for chemicals.



#### Client

Japan China Oil Development Corp.

#### Location

Bohai Bay, China

#### Well Type

Oil/offshore platform

#### Casing/Tubing

- 7-in., 26-lb/ft casing
- 2 7/8-in. tubing

#### Setting Depth

4,000 ft (1,219 m)

#### BHA Details

Sliding sleeve

#### Products/Services

- Hydraulic lift services
- Reverse-circulation jet pump