Magnus® RSS Drills Thermal, Horizontal Well With Exceptional In-Zone, SAGD Wellbore Placement

Objectives

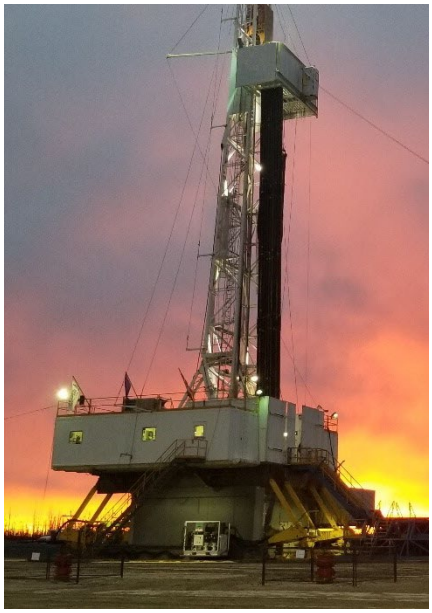
- Determine the viability of a push-the-bit rotary steerable system (RSS) in the development of steam-assisted-gravity-drainage (SAGD) assets by drilling the lateral section of a thermal well in one run.
- Achieve a rate of penetration (ROP) of 328 ft/hr (100 m/hr) to reduce the drilling time compared to a conventional motor and measurement-while-drilling (MWD) bottomhole assembly (BHA).
- Create a quality wellbore while remaining within these drilling windows:
  - "Pseudo" window of ±0.66 ft (0.2 m) true vertical depth (TVD) and ±3.28 ft (1.0 m) (side to side) from the plan
  - "Absolute" window of ±1.64 ft (0.5 m) TVD and ±6.56 ft (2.0 m) (side to side) from the plan

Our Approach

- Comprehensive pre-job analysis led Weatherford and the operator to select the optimal BHA configuration. The motorized push-the-bit RSS BHA components included the following:
  - Ideal bit selection
  - Optimal motor configuration
  - Optimized hydraulics
  - Precise stabilization
- The Weatherford team started drilling in autopilot mode with a preset build bias targeting the "pseudo" window. When maintaining this window proved difficult, the field personnel simultaneously switched to manual steering and refined the build bias settings. Together, these actions enabled the team to maintain control, resume in autopilot mode, and drill within the "absolute" window.
- The lateral section was control drilled at 262 ft/hr (80 m/hr) with an instantaneous ROP greater than 328 ft/hr (100 m/hr).

Value to Customer

- The successful Magnus RSS lateral drill proved that push-the-bit technologies are applicable to developing thermal, SAGD assets. The customer will assess the economic feasibility for a future drilling program.
- Over the lateral section, the RSS achieved an average dogleg severity of 0.62°/100 ft (30 m) for a smoother, less tortuous wellbore that saved the customer 3.17 hours of rig time when running and setting slotted production liner.



The Magnus RSS proved the viability of push-the-bit technology when drilling thermal, SAGD assets.

LOCATION
Alberta, Canada

WELL TYPE
Horizontal, onshore, producer, SAGD

FORMATION
McMurray thermal play

FIELD
Newby

HOLE SIZE AND ANGLE
8.75 in. (222 mm), 90°

MEASURED DEPTH/LATERAL LENGTH
2,995 ft (913 m)

PRODUCTS/SERVICES
- 6 3/4-in. Magnus RSS
- HyperLine™ drilling motor
- HEL™ hostile-environment-logging MWD system

Weatherford®

 13148.00