A deepwater well operator in the Gulf of Mexico (GoM) needed fluid samples for the appraisal and development of several oil-bearing reservoirs, including a critical heavy oil zone. A key concern was recovering reservoir fluid samples with a very low level of oil-based filtrate contamination that could be maintained in a single-phase condition from the reservoir to the analysis facility. Additionally, the operator had a strict requirement for minimizing stationary time during sampling and pumping the hydrocarbon volumes to the wellbore.

To meet these challenging requirements, the operator chose the RCX® Sentinel focused sampling service from Baker Hughes, a GE company (BHGE). Extensive prejob modeling projected that significant benefits could be gained by using the RCX Sentinel service in reservoirs with permeabilities ranging from 30 to 700 md, and by staying above the reservoir fluid bubble point.

The RCX Sentinel service is the latest offering in the BHGE formation sampling and testing portfolio. Built upon the reliable RCX platform, the service enables faster, cleaner, and ultimately safer sampling while operating in hostile environments.

The RCX Sentinel service simultaneously collects reservoir fluids into a formation testing probe that has two concentrically arranged fluid inlets. Independent control of separate fluid pumps optimizes the rate of reservoir fluid intake into each inlet to establish a precise fluid focusing effect. Data from two fluid analyzer modules, operating simultaneously, help engineers understand the sample cleanup and drive real-time decision-making.

The operational challenges of this project were modeled in advance using the Deployment Risk Management (DRM™) service from BHGE, which matches specific wellbores with an advanced suite of technologies. In this instance, prejob planning indicated that pipe-conveyed logging would be the best technology for deployment.

The RCX Sentinel service was used at three discrete sampling stations with varying fluid and formation properties. The RCX Sentinel service string was deployed for 52 hours, during which time multiple

### Challenges
- Reservoir appraisal needed in a heavy oil zone using a deviated deepwater borehole
- Operator required clean samples but wanted to minimize sampling time
- Multiple sampling targets were necessary
- Innovative deployment technology was needed to overcome difficult well design

### Results
- Successfully tested 101 depth stations, covering 13 deployments in six wells, in 52 hours
- Achieved 97% pad seal efficiency
- Dropped sample contamination levels down to less than 2%, from 25%, in a 16 API heavy oil zone
high-quality pressure tests were taken and samples with 100% reliability were obtained. Ultimately, eight single-phase samples were collected with filtrate contamination levels of less than 2%.

According to the operator, “RCX Sentinel hit a home run by obtaining 1% contamination samples in the critical 16 API heavy oil zone. On a previous well in this same zone, single-probe sampling yielded 25% contamination.”