

Case study: Asia Pacific

Early chemical services engagement saved operator millions in CAPEX

A major oil producer engaged Baker Hughes to partner with them and their engineering firm in front-end engineering design (FEED) work for a major new field start-up in the Asia Pacific region. This project was in a new development area, requiring establishment of a robust supply chain. Initial work began several years before start-up was expected.

Early in the process, Baker Hughes analyzed field data and provided advice on flow assurance and integrity management issues. Several critical issues were identified. Working together, risks were quantified, and solution options were developed. Of greatest concern was the pour point of the crude which would naturally gel at 95°F (35°C).

Baker Hughes paraffin experts helped design laboratory test procedures to accurately define wax mitigation program parameters. A pour-point depressant/wax inhibitor was identified that could reach the 70°F (21°C) pour point specification at a low dosage rate given the

challenging crude properties observed during production. This allowed for more accurate OPEX calculations and led to a design scenario that ultimately saved the customer several million dollars in CAPEX costs.

Baker Hughes performed a series of tasks during the FEED design process that were essential to removing risks before field start-up:

- Production chemistry risk assessment
- Development of a complete chemical treatment program
- Review of the chemical injection system design
- Materials compatibility testing
- Review of sample points for system control
- Specification of performance monitoring requirements
- Development of an inventory management plan
- Production chemistry start-up plan

Challenges

- A major field start-up in a new Asia Pacific development area
- Waxy paraffinic crude with a high pour point
- Supply chain logistics

Results

- Reduced risk for operator and engineering firm
- Millions of dollars in CAPEX savings
- Trouble-free commissioning and start-up
- OPEX savings with optimized chemical selection
- Field analysis and chemical selection process
- Comprehensive chemical program design

A robust supply chain to this new development area was established, and three months of product was stocked in country prior to well testing. Commissioning engineers were provided to handle all production chemical issues during well tests and early production. They were also able to assist the customer with on-site laboratory setup during early and later phases of production, operator training, pour point testing, H₂S analysis and crude survey sampling.

Baker Hughes was chosen for chemical services based on our worldwide flow assurance experience and an unwavering commitment to understanding the priorities of the customer and the specific field requirements. By being involved with the customer from an early stage, all chemical aspects were considered fully. This minimized the risk for both the operator and the engineering firm and translated to an easy and problem-free start-up. By selecting and testing a pour point depressant/wax inhibitor early in

design, the customer was able to choose the optimum field design scenario, saving several million dollars in CAPEX. The system, as built, had correct chemical tank and pump sizing, chemicals compatible with the system materials, and correct sample points for system monitoring and optimization. As a result, no flow assurance issues occurred during start-up or beyond.