High-Performance Lubricant Saves Operator USD 480,000 in ERD Well

BARALUBE® W-940 LUBRICANT DECREASES FRICTION FACTORS BY 33%, PERMITTING SINGLE-TRIP COMPLETION RUN 2 DAYS AHEAD OF PLAN

OFFSHORE UNITED ARAB EMIRATES

CHALLENGE

- Mitigate high friction factors while running upper completions in ERD wells
- Decrease time required to complete the well
- Ensure formation fluid compatibility with the lubricant

SOLUTION

Halliburton Baroid engineered solution included:

- 2% v/v BaraLube® W-940 lubricant to treat completion brine
- Corrosion, lubricity, and compatibility tests to validate lubricant performance

RESULTS

- Qualified lubricant for this application
- Reduced CHFF by 33% compared to offset experience with no lubricant
- Accomplished single-trip completion run, saving the client 2 days of rig time (equivalent to a savings of USD 480,000 compared to plan)
- Led to continued use of BaraLube® W-940 on all similar ERD single-trip completions

OVERVIEW

A major operator identified an opportunity to improve completion efficiency by reducing friction factors while running the upper completion on its extended reach drilling (ERD) wells offshore UAE, with total depths over 40,000 ft. Historically, a 6⅝-in. production packer had been run and set at depths between 13,000 ft and 16,000 ft on drill pipe in the 9⅝-in. casing. However, an extra trip could be saved if the packer was run on completion tubing in completion brine.

CHALLENGE

Extended reach completions can exhibit high metal-to-metal friction factors, resulting in tubing buckling, reduced running speed, and use of intermediate completions, which increases the time and cost of the completion operation. This limits the ability of the operator to run the packer in a single run using the completion tubing, instead of a dual run using the more robust drill pipe. Completion brines are inherently not lubricious (except for calcium chloride brine) and, therefore, require additional chemical treatment to reduce coefficients of friction to acceptable levels.

SOLUTION

Halliburton Baroid recommended the addition of BaraLube® W-940 lubricant to the completion fluid. This high-performance lubricant demonstrates an excellent compatibility profile, performing in a range of base fluids and resistant to oil contamination. The selection of the lubricant was based on rigorous testing:

1. Lubricity tests — showed a consistent 52% reduction in the coefficient of friction (CoF) with the use of BaraLube W-940 in mixed monovalent brine.
2. Compatibility tests (performed with crude oil) — observed no evidence of incompatibility, such as emulsion formation.
3. Foaming tests — demonstrated no tendency to foam. Additionally, no cheesing or greasing out was noted.
4. Corrosion tests — showed negligible change in corrosion rates with BaraLube W-940 addition to the completion brine.

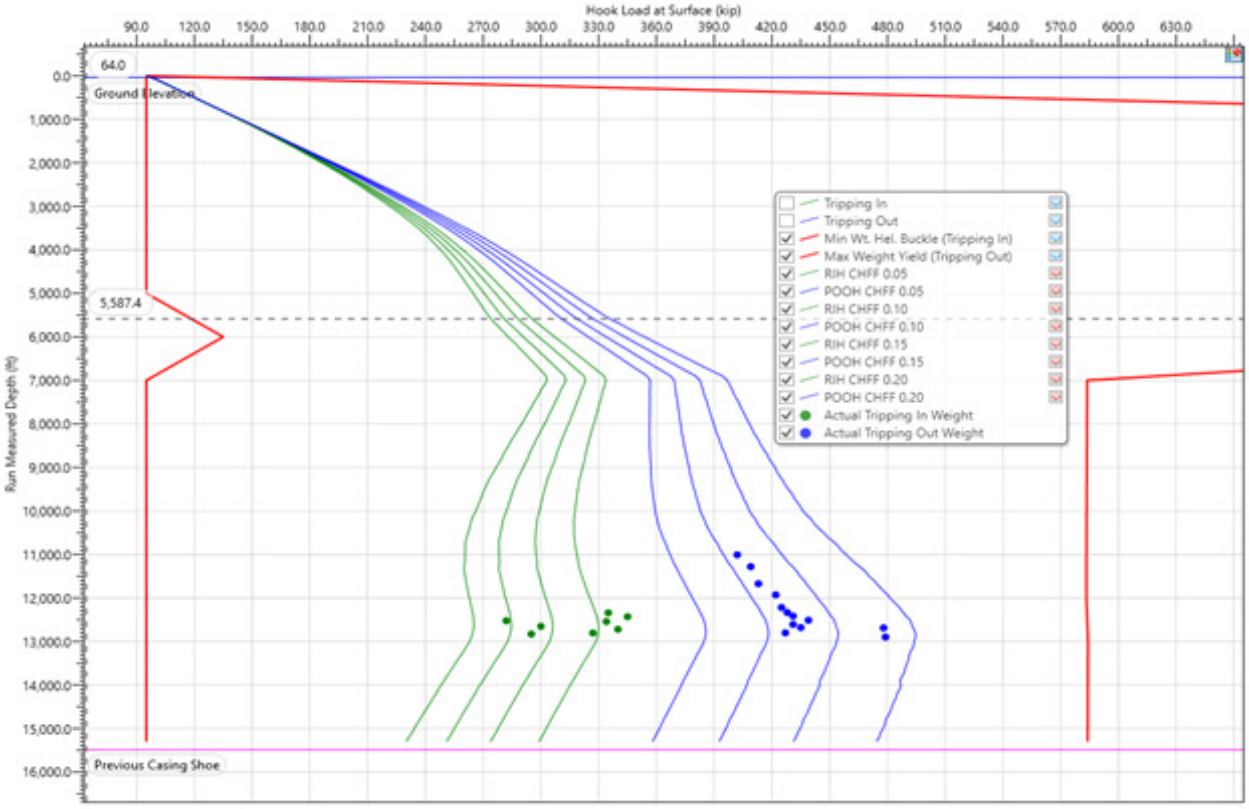
Halliburton presented the qualification studies to the Operator. Based on Baroid's technical support and the lubricant performance, the operator approved the use of BaraLube W-940 in the completion brine and changed the upper completion program from a two-trip run to a single trip.

RESULT

The completion brine treated with BaraLube W-940 was successfully displaced into the well, with Hookload measurements recorded before and after the displacement. It was noted that there was a reduction in cased-hole friction factors (CHFF) of 50% for the pick-up weights and 33% for the slack-off weights. Subsequently, while running the upper completion on 4½-in. tubing, the CHFF was reduced to between 0.05 - 0.10, which represents a reduction of at least 33% compared to offset wells with untreated completion brine.

This single run completion reduced rig time by two days compared to a two-trip completion run, equating to a monetary saving of USD 480,000.

After the first successful deployment of BaraLube W-940, the operator is planning for continued single-trip completion runs using Baroid's premium lubricant.



Friction factors before and after the well was displaced with BaraLube W-940.

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