WELLCLEAN II Advisor

Schlumberger

Designing a spacer fluid with optimal rheological properties can now be accomplished to aid in the ultimate goal of zonal isolation and mud displacement. Rapid selection and adjustment of optimal additive concentrations in spacer fluid is now possible with WELLCLEAN* II Advisor software.

A powerful tool

The WELLCLEAN II Advisor reduces the time and effort involved in optimizing properties of MUDPUSH* II spacer fluids, whether they are designed for turbulent or for laminar flow. Well data automatically imported from CemCADE* cementing design and evaluation software limit the number of specific input data and reduce the risk of error.

When designing a MUDPUSH II spacer for removing mud in turbulent flow, the WELLCLEAN II Advisor software outputs the optimized spacer additive concentration required to stabilize the spacer. At the same time, it keeps fluid properties at an ideal level to achieve turbulent flow at low pump rates.

If the strategy implies design of MUDPUSH II spacer for laminar flow, WELLCLEAN II Advisor software provides the optimized spacer properties and relevant additive concentrations at the required density and temperature. Additive concentrations can be alternatively input and consequences on spacer properties simulated. Spacer properties are always compared to those of mud and cement inside the well.

The user can then observe the effects of the design on effective laminar flow criteria for interfaces of both the mud-spacer and the spacer-cement along the entire interval.

Effective laminar flow criteria are guidelines developed by Schlumberger for optimizing mud displacement in laminar flow in an eccentric annulus.

A reliable tool

The WELLCLEAN II Advisor software includes a comprehensive database of laboratory tests. It also includes mathematical models and a reasoning engine capable of deriving spacer properties. Properties are derived by interpolation of results at various temperature, density and additive concentrations.

Field measurements of spacer properties designed using WELLCLEAN II Advisor software have proved to be extremely accurate as compared to "predicted" design data.

Applications

- Effective mud removal using optimized MUDPUSH II spacer fluid
- Jobs in temperatures to 300°F [149°C]

Benefits

- Simplified MUDPUSH II design process resulting in reduced time and effort
- Consistent MUDPUSH II design criteria

Features

- Proposed MUDPUSH II spacer properties for optimum mud removal, either in turbulent or laminar flow
- Prediction of MUDPUSH II additive concentrations and properties as a function of density and temperature
- Calculation of effect of water quality (fresh, sea, salt)
- Barite as standard weighting agent, with option to change density
- Three rheological models: Bingham plastic, power law and Herschel-Bulkley
- Viscometer reading prediction

Case history

On a high-pressure well in Saudi Arabia, the mud density required to kill the well was 18.7 lbm/gal [2240 kg/m³]. A fracture gradient very close to the pore pressure resulted in losses across the weaker zones. In these conditions, a decision was quickly made to run and cement a liner. An optimized spacer fluid was required at very short notice. Typically, the design of an optimal spacer in this circumstance would be a lengthy laboratory process.

However, the WELLCLEAN II Advisor software quickly optimized the spacer design based on actual well conditions and fluid properties. The liner was successfully cemented, and the client was pleased with the fast response and the efficient process in designing an effective spacer under difficult conditions.

Designing a spacer with optimized properties has never been an easy task. WELLCLEAN II Advisor software simplifies the design process.

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