

RESERVOIR CASE STUDY PRESSURE-PULSE CODE TESTING [PCT*]

Challenge

An operator seeking insights into the distribution of remaining reserves and new field development opportunities wanted to calibrate a 3D model for a selected area in a mature Siberian waterflooded field.

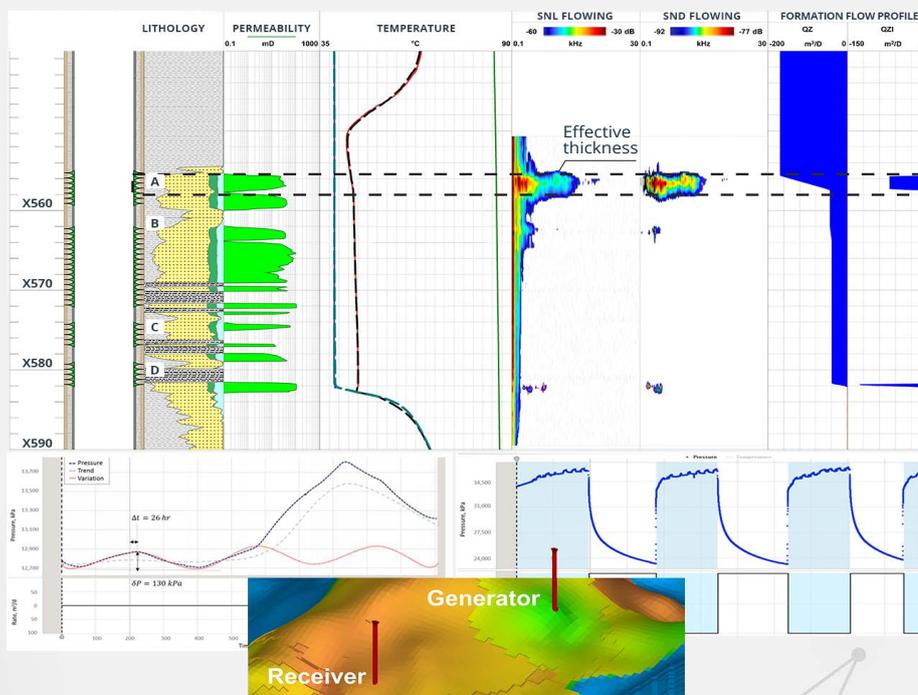
Solution

Pressure-pulse code testing [PCT] is a significant evolution of conventional pressure interference testing because it is not affected by 'cross-talk' from offset wells, so all wells in the field can continue normal operations and production is unaffected.

The PCT service was used in a selected area of the field and in each well. The pressure signals from all the other wells around it were recorded to determine the reservoir parameters.

High-precision temperature [HPT*] and high-definition spectral noise [SNL-HD*] surveys were also conducted in some of the wells to determine the vertical sweep efficiency around them. The existing 3D permeability and compressibility models were calibrated using the data acquired for a calibration area of known phase composition. With porosity, permeability and compressibility fixed, the vertical sweep efficiency was determined for other areas.

Breakthrough technology provides a clear picture of remaining reserves, better development plan and reduced water cut.



TGT's PCT service integrates several proprietary technologies, including downhole measurements, processing and modelling to determine the reservoir parameters between surveyed wells. Outputs include permeability, formation compressibility, effective thickness and saturation, as well as fault and shale break locations. Notably, this can be achieved without shutting down production.

Outcome

The PCT-calibrated 3D model brought improved predictions of water and pressure propagation, thereby giving the operator a new outlook on the distribution of the remaining reserves and valuable insights in to new field development planning and redevelopment opportunities. New wells drilled according to the PCT-calibrated model produced with a much lower water cut than the field average.

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