Optimizing Underground Gas Storage

Case study: Maximum deliverability increased by 500% for peak shaving

Challenge
Design a plan to optimize storage operations for a gas storage field.

Solution
Schlumberger Data & Consulting Services (DCS) characterized and constructed an integrated model, including wells and facilities.

Results
Increased maximum deliverability by 500% and working gas volume by more than 300%.

Integrated model
A gas storage field near the eastern coast of the United States serves a large metropolitan market and is used primarily for peak shaving. Gas is sometimes withdrawn in the morning and injected in the afternoon.

DCS ran modified isochronal pressure transient tests in wells in the field. Analysis of the buildup data provided horizontal permeability, total skin, and flow efficiency.

Working gas volume and maximum deliverability optimized
An extended field flow test was performed to determine reservoir pore volume and gas in place. As a result, the operator petitioned to increase the permitted operating pressure range and working gas volumes from 60 MMcf to 200 MMcf, more than 300%.

DCS ran pressure tests to determine existing and potential field deliverability and performed a sensitivity analysis of facilities and operating conditions to identify system bottlenecks. As a result, maximum deliverability of the system was optimized.

Integrated reservoir, wells, and facilities analyses demonstrated how to increase the deliverability by 500% from less than 10 MMcf/d to over 50 MMcf/d, using existing facilities and wells.

DCS created a simple predictive tool that field personnel can use to predict field performance under various operating conditions.

E-mail dcs@slb.com or contact your local Schlumberger representative to learn more.

Integrated reservoir, wells, and facilities analyses identified bottlenecks that, when eliminated, increased system deliverability by 500%.