

**3DEXPERIENCE®**

# NATURAL RESOURCES **UNIFIED RESERVOIR INDUSTRY SOLUTION EXPERIENCE**

Explore, develop, and produce—safely and efficiently



## **COLLABORATIVE RESERVOIR MANAGEMENT**

In the Oil and Gas industry, there is more pressure than ever to produce safely and efficiently. Business leaders are tasked to safely produce from increasingly challenging reservoirs while keeping their operational costs down. Comprehensive reservoir management is essential to deliver optimal production.

**Unified Reservoir** enables you to achieve effective reservoir management through advanced petrotechnical workflows, including consideration of enhanced rock mechanics and improved integration of modeling and simulation. This breaks organizational silos by delivering effective collaboration, allowing critical geomechanics data be to harnessed in decision making.

An Integrated Solution, **Unified Reservoir** improves efficiency in drilling, field development, fracking and production workflows by introducing:

- Advanced rock mechanics, fully coupled with both reservoir modeling and flow simulation.
- An integrated and collaborative project lifecycle management environment for better control and monitoring of reservoir development.

**Unified Reservoir** combines reliable subsurface knowledge with state-of-the art rock mechanics to assess how the reservoir responds to fracking, drilling campaigns, completion and production optimization programs. It also solves drilling, wellbore stability, fault re-activation, fracking, re-fracking and subsidence challenges.

## MITIGATE DEVELOPMENT AND PRODUCTION RISKS

Uncertain state of stress and unforeseen changes in the integrity of the subsurface can have significant economic and environmental consequences. Understanding these risks helps mitigate development and production risks, and provides a path to optimally develop the field and maximize recovery. For both conventional and unconventional reservoirs, Dassault Systèmes' geomechanics simulator delivers:

- Finite element analysis of the sub-salt structure.
- Stress estimation using (3D/4D) seismic derived data combined with geomechanically derived stress states, calibrated to petrophysical analysis.
- Wellbore stability and integrity analysis to determine the safe operational formation pressure window.
- Subsidence and compaction analysis to simulate the resulting impacts of hydrocarbon extraction on the subsurface.
- Cap-rock integrity analysis, using the integrated geomechanics solution, models and simulates the time-dependent states of stress and formation pressure.
- Well-casing design leverages fully coupled pore pressure-displacement capabilities and thermal-stress analysis to solve casing failure, cyclic steam simulation and SAGD issues.
- Re-fracturing analysis using finite-element-modeling provides detailed information on the hydraulic and natural fracture interaction, in-situ stress distribution, fracture-geometry and propagation.

## UNIFIED RESERVOIR BENEFITS

- Improves predictability, safety and cost effectiveness of Exploration and Production operations while enabling optimal ROI in oil and gas projects.
- Advanced geomechanics that generates superior operational results.
- Eliminates collaboration gaps, enabling effective workflows, improving information and knowledge exchange between disciplines.

## OPEN CONNECTIVITY

Leveraging Dassault Systèmes **3DEXPERIENCE®** platform, which incorporates decades of the company's experience in transforming numerous industries, Unified Reservoir provides open connectivity that supports and works with standard technologies in reservoir modeling and flow simulation. It integrates all aspects of reservoir management to deliver unmatched process and manageability.

## PROCESSES FOR UNIFIED RESERVOIR

**Unified Reservoir** Industry Solution Experience includes the following processes:

- Reservoir Modeling
- Geomechanics
- Reservoir Simulation

For more information, visit [www.3ds.com/natural-resources](http://www.3ds.com/natural-resources)

## Our 3DEXPERIENCE® platform powers our brand applications, serving 12 industries, and provides a rich portfolio of industry solution experiences.

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