Incorporate well-centric geomechanical analysis into your 3D reservoir models to optimize your well plans

As a drilling engineer responsible for controlling cost and reducing risk, you need to optimize your well plans and proactively prevent potential rock mechanical challenges that, if undetected, can result in unsafe drilling plans and consequently unintended high-priced mistakes. To do this you need a tool that captures the varying stresses, pore pressures, and rock properties of your entire field and builds robust, reliable, 3D static geomechanics models that integrate high-resolution, calibrated 1D well models.

Baker Hughes JewelSuite™ 3D GeoMechanics is that tool. It offers proven methods to build accurate 3D geomechanical models from 3D structural models and 1D well models. From the 3D geomechanical models, you can extract virtual 1D well models for arbitrary well locations and trajectories for both planned wells and for wells with incomplete data. This powerful application addresses moderately complex geology without major stress distortions and overcomes the limitations of 1D depth stretching that can be used for near vertical wells in simple geology by honoring structural and stratigraphic constraints.

Optimized well planning
JewelSuite 3D GeoMechanics helps you optimize your wells even in complex situations. Saving time and lowering costs is especially critical when planning deepwater drilling, exploration wells, high-pressure/ high-temperature (HP/HT) environments, high angle wells, and extended reach wells. You can quickly build and update reliable models using JewelSuite 3D GeoMechanics and easily apply the 3D static geomechanics workflow to advanced geomechanical applications such as wellbore stability, critically stressed fractures and faults, hydraulic fracturing, and 4D geomechanics.

JewelSuite 3D GeoMechanics provides fully integrated geombodeling workflows, an advanced user interface, a 3D framework, and robust collaboration and customization tools combining:
- Technical domains, including geology, reservoir engineering, drilling, completions, geomechanics, wellbore construction, production engineering and asset management
- Spatial scales from basin to wellbore components
- Dimensions comprising 1D, 2D, 3D, and 4D (time)

Applications
- Drilling projects in areas with moderately complex geology without major stress distortions, including:
  - Exploration, high-angle, and extended reach wells
  - HP/HT environments
  - Depleted reservoirs
  - Underbalanced drilling

Features and benefits
- Creates 3D geomechanical models from 3D structural models and 1D well models
- Quickly and reliably models the spatial variability of geomechanical attributes
- Accurately captures 3D overburden, rock mechanical properties, formation pore pressure, fracture pressure, and horizontal stresses
- Analyzes fault and fracture stability
- Extracts virtual 1D well models from 3D volumes
- Quickly evaluates multiple scenarios for well locations and trajectories
- Connects to JewelSuite 4D GeoMechanics and other advanced geomechanical applications for additional insight
- Models stress and pore pressure from well data
- Analyzes wellbore stability
- Simulates 3D full-field dynamic geomechanics
Third-party technology such as geospatial, seismic, hydraulic fracturing, fluid flow, and mechanical simulation

Fault stability analysis
Predicting the slip potential of faults is critical when making decisions about well placement and design, reservoir compartmentalization and drainage patterns, production strategies, and enhanced recovery techniques.

With JewelSuite 3D GeoMechanics, you can quickly model fault structures, stress, and pore pressure and analyze the effects of injectables used during drilling operations.

Improved efficiency and ease of use
You can accelerate your workflow and reduce errors using several key features included in JewelSuite 3D GeoMechanics. Workflows lead you step-by-step through processes and enable even the most novice users to quickly learn the application. The built-in audit trail captures all actions performed for a project and provides auditable and reproducible modeling steps that can easily be converted to workflow automation scripts. Building reliable 3D geomechanical models with JewelSuite 3D GeoMechanics is straightforward and painless. You can use the application as a standalone tool or in combination with other geomechanics software to complement your existing workflow.

Seamless connectivity with other applications
Our software offers the most advanced multidisciplinary knowledge and techniques available to interpret your data quickly, accurately, and effectively to optimize your drilling campaigns. JewelSuite 3D GeoMechanics is built on the JewelEarth™ development platform so you can easily incorporate your models and analysis in an advanced, integrated geomechanical workflow. You can use applications seamlessly by exchanging data between them through shared files, or by dragging and dropping data.

Learn more—contact us today
To learn more about JewelSuite 3D GeoMechanics software, contact your Baker Hughes representative today or visit BakerHughes.com/reservoir-software.