Training course:

Advanced Geomechanics Course for Drilling Optimization

Class Size: Limited to 10 participants
Level: Advanced. Completion of the Fundamentals of Geomechanics course is recommended.
Duration: 5 days (40 academic hours)

Course overview:

The course is designed to combine concise theoretical instruction with extensive hands-on practice, enabling participants to apply newly acquired knowledge immediately.

Practical sessions focus on building a 1D geomechanical model in specialized software, including the calculation of static elastic and strength properties, pore pressure and in-situ stresses, borehole stability analysis, and sensitivity studies. Participants will use these results to predict a safe drilling window for a planned well trajectory and present their findings in a client-oriented format.

The course also examines the impact of reservoir depletion and field development—including changes in pore pressure and temperature—on the in-situ stress regime. Participants will learn how these changes influence drilling and well completion operations, reservoir stimulation (hydraulic fracturing, injection and waterflooding), production performance, and the risk of early water breakthrough.

The program also covers the fundamental principles of 1D geomechanical model construction using industry-standard geomechanics software.

Course Schedule:

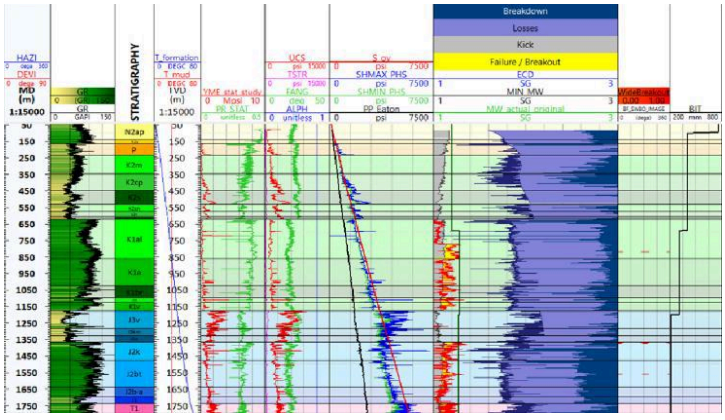
Day 1 - Entry assessment and course review
- Entry assessment
- Review of key concepts covered in the Fundamentals of Geomechanics course

Day 2 - 1D geomechanical modeling workflow
- Overview of the generalized workflow for building a 1D geomechanical model along a wellbore
- Application of the model at different stages of the field life cycle
- Analysis of available input data
- Understanding project challenges, objectives, and technical requirements
- Working with key datasets
- Assumptions, simplifications, and evaluation of potential uncertainties in calculations.

Day 3 - Integrated wellbore geomechanics and drilling optimization
- Project setup and workflow preparation
- Analysis of drilling data
- Construction of time-depth plots during well construction
- Collection of calibration data from hydraulic fracturing, well cleanup, and production operations
- Calculation of a 1D geomechanical model for a reference well, from mechanical facies modeling to borehole stability analysis
- Calibration of calculations against measurements, test results, and observed drilling events
- Transfer of calculations from the reference well to the planned well trajectory
- Prediction of the safe drilling window
- Recommendations for optimizing well trajectory, well design, drilling fluid program, and cementing program
- Wellbore condition monitoring
- Differential sticking
- Borehole stability analysis
- Use of geomechanical parameters for optimization of well trajectory and well design
- Preparation of summary presentation slides for the Client
- Discussion of results and round-table session

Day 4 - Advanced geomechanical applications
- Hydraulic fracturing
- Sand production
- Subsidence
- 3D and 4D geomechanical models

Day 5 - Hands-on software training
- Practical exercises using specialized geomechanics software



Target audience:

- Drilling Engineers, Drilling Supervisors, and Well Planning Engineers
- Reservoir Engineers and Field Development Engineers
- Hydraulic Fracturing (Stimulation) Engineers and Completion Engineers

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The course also examines the impact of reservoir depletion and field development—including changes in pore pressure and temperature—on the in-situ stress regime. Participants will learn how these changes influence drilling and well completion operations, reservoir stimulation (hydraulic fracturing, injection and waterflooding), production performance, and the risk of early water breakthrough.
The program also covers the fundamental principles of 1D geomechanical model construction using industry-standard geomechanics software.

Course Schedule:

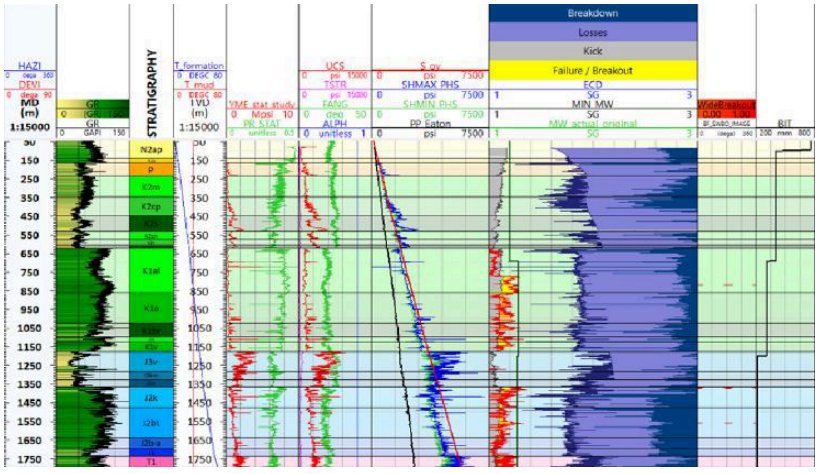
Day 1
– Entry assessment
– Review of key concepts covered in the Fundamentals of Geomechanics course

Day 2
– Overview of the workflow for developing a 1D geomechanical model along a wellbore
– Application of 1D geomechanical models throughout the field life cycle
– Analysis of available input data
– Understanding project challenges, objectives, and technical requirements
– Working with key datasets
– Assumptions, model simplifications, and assessment of calculation uncertainties.

Day 3
– Project setup and workflow preparation
– Analysis of drilling data
– Construction of Time–Depth plots for well construction
– Collection of calibration data from hydraulic fracturing, well cleanup, and production operations
– Development of a 1D geomechanical model for a reference well, from mechanical facies modeling to borehole stability analysis

Day 4
– Calibration of the geomechanical model using laboratory measurements, field data, and observed drilling events
– Transfer of the calibrated model from the reference well to a planned well trajectory
– Prediction of the safe drilling window
– Recommendations for optimizing well trajectory, well design, drilling fluid program, and cementing program

Day 5
– Wellbore condition monitoring
– Differential sticking analysis
– Borehole stability assessment
– Application of geomechanical parameters for well trajectory and well design optimization
– Preparation of a technical summary presentation for the Client
– Presentation of results, discussion, and round-table session



Target audience:

– Geomechanics Engineers and geoscientists responsible for geomechanical modeling and wellbore stability
– Reservoir Engineers and Field Development Engineers
– Petrophysicists, Geologists, and Geophysicists involved in subsurface characterization and model building
– Production Engineers