Geomechanics and Sand Control

Table of Contents:

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Description:

It is estimated that 70% of the world's oil and gas reserves are contained in reservoirs where sand production is, or will become, a problem during the life of the field. Consequently, and effective sand management strategy is critical in maximizing hydrocarbon production while minimizing sand production.

The first three days of the course will cover the topic of geomechanics with the last two days covering the topic of sand control. These are very much connected but highly specialized so, to provide participants with the maximum value, separate instructors will be used to provide subject matter experts for both topics.

Course Design Combines the Geomechanics and Completions Components Our course starts by looking at the geomechanics principles used in the prediction of rock failure and sand production, including pore pressure prediction and 3D reservoir geomechanics, then goes on to the review the principles, applications, and design considerations, of the various sand control techniques commonly used across the industry, including the standalone screens, gravel packs, high rate water packs and frac packs.

Includes Specific and Practical Case Studies Practical examples and exercises, including some from Malaysia, will make extensive use of Microsoft Excel. Participants should be familiar with basic calculation and charting functions in Microsoft Excel and should either bring their own computer or be provided with access to one loaded with Microsoft Excel (e.g. shared computers for the group)

Objectives:

- How to determine reservoir and overburden stresses, their magnitudes and orientation
- How to determine rock strength on core and how strength can be predicted in the overburden and in uncored intervals
- What data is required to build and calibrate geomechanical models
- Understand how sand failure happens and how to do Wellbore Stability Modeling.
- Perform 3D reservoir geomechanics
- When to manage sand and when to exclude it
- The various sand control techniques used in the industry including standalone screens, gravel packs, high rate water packs and frac packs
- Basics of sand control selection, design & installation

Who should attend?

This training program is developed and designed for people who would like to understand the roles of geomechanics in sand production and how to manage and control this when it happens. Participants do not need to have prior knowledge of geomechanics or sand control as the fundamental principles required to understand the various course topics will be discussed at the start of the course.

Course Outline:

Day 1 - Geomechanics

- Introduction to Geomechanics and Basic Concepts
- Rock Strength and Modelling

Day 2 - Geomechanics

- Far Field and Borehole Stresses
- Sand Failure Prediction

Day 3 - Geomechanics

- Pore Pressure Prediction
- Wellbore Stability
- Reservoir Geoemechanics (High Level)
- Field Case Studies

Day 4 - Sand Control

- Sand Control
- Sand Control Techniques
- Completion Types and Selection
- Formation Sand Sampling
- Screen and Gravel Selection
- Practical Project

Day 5 - Sand Control

- Well Preparation for Sand Control
- Pumping Fluids Systems
- Surface and Downhole Equipment
- Sand Control operations Overview
- Gravel Placement Techniques
- High Rate Water Packing and Frac-Packing