SAND CONTROL AND MITIGATION

Implementing Theoretical and Laboratory knowledge to Enhance Sand Control Experience

Introduction

When developing a sandstone oil or gas reservoir, a prediction of sand production is required to evaluate the necessity of sand control. Sand prediction technology also assists in selecting the economically most attractive sand control techniques. This course will enable participants to understand the key factors that need to be accounted for when managing the risk of sand production and how these are integrated into developing an effective and economical sand control process.

Course Learning Outcomes

Capitalize on the expert knowledge to gain maximum value on these vital issues:

- DETERMINE causes of sand production
- LEARN basic rock mechanics related to sand control
- GAIN a theoretical background on establishing sandstone failure criteria
- DEVELOP your knowledge on sand-free production rate selection
- SELECT the best sand control method
- OPTIMIZE recent sand control and sand management methods
- CITE practical examples on sand control issues
- FIND out about case histories in sand production

Who Should Attend

This course is suitable for intermediate level petroleum engineers, geologists, technologists and field personnel working in the oil and gas industry with a technical or operational interest in wells that produce sand.

Course Outlines

Day 1: ROCK TESTING BACKGROUND RELATED TO SAND PRODUCTION

- Introduction to Oil and Gas Industry
- Reservoir Rock Types and Properties
- Unconsolidated sand
- Weak to Moderate Strong Sandstone
- Earth In-Situ Principal Stresses and World Stress Map
- Elastic, Plastic, and Viscous Models of Rock Behavior
- Overview on Common Rock Mechanics Tests
- Rock Failure Criteria
- Discrete and Multi-State Triaxial Compression Test
- Rock Elastic and Frictional Properties Measurement
- Tutorial on using Laboratory Derived Data for: Establishing Failure Criteria, Defining Frictional Properties and Computing Elastic Properties

Day 2:

- Application of Rock Mechanics in Petroleum Engineering Practices
- Causes and effects of sand production
- Linear-Poroelastic Solution for Stresses around Circular Boreholes (Kirch Solution)
- Coupled Darcy-Kirch Solution for Sand-free Production Rate Prediction
- Yield-Zone Theory
- Sanding Capability Prediction Approach
- Typical Sand Control Laboratory Set-Up
- Sand and Sandstone Samples Demonstration
- Tutorial on Calculation of: Production Induced Yield-Zone around the Productive Zone and Calculation of the amount of Movable Sand

Day 3:

- Sand Downhole Control Concept
- Completion Techniques in Unstable Formations
- Chemical Methods !#Well and Perforations Orientation
- Downhole Emulsification
- Sand Transportation
- Sand Particle Size Distribution
- Gravel Packing Design
- Frac and Pack Stimulation
- Sand Surface Management Concept
- Accumulation, Cleaning and Disposal
- Sand Production Monitoring
- Case Studies
- Review and Conclusions
- Multiple Choice Assessment