Overview

Production from wells is enhanced by ensuring the wells are designed optimally when drilled and completed. Particular focus is on assuring unrestricted flow through the lower completion of the wells for which sand control design, implementation, evaluation and subsequent management is key.

This 5-day “Fundamentals of Sand Control Design and Implementation” training course provides participants with the knowledge, understanding and tools required to design, implement and manage sand control completions. It starts by looking at the fundamental sand control considerations involved in completing a well and introduces the various sand control techniques commonly used across the industry, including standalone screens, gravel packs, high rate water packs and frac-packs.

The course then builds up the participants’ understanding of sand control completion and pumping operations through detailed discussion and practical exercises covering the principles, applications and design considerations of the various techniques.

Finally, it reviews post-job evaluation methods used in the confirmation of treatment success and investigation of failure as well as remedial sand control options, providing a full overview of sand control design, implementation and evaluation.

Objectives and Key Outcomes

The course is delivered interactively through engaging class lectures, presentations, practical exercises and projects which help participants to visualise downhole processes and cement their understanding of each technique's advantages, limitations and application window for use in their upcoming completions. A best in class commercial sand control software package (PackPro) is also used during the course to concretise theoretical learnings and practicalize designs and implementations.

By the end of the course, delegates will be able to:

- Evaluate sand control requirements and design treatments for wells.
- Visualise downhole processes, put into practice what they learn and gain practical sand control design and evaluation experience.
- Explore a variety of scenarios to identify the impact of design changes on the likelihood of treatment success.
- Use the industry's most advanced data analysis techniques to better understand complex downhole events and mechanisms.
Apply the full sand control simulation, evaluation and optimisation workflow to continuously improve designs while minimizing risk.

Who Should Attend
Junior Reservoir, Completion, Drilling and Production Engineers/Technologists, Field operations and Technical personnel.

Course Outline

Day 1

Session 1: Sand Control Introduction
Review the basics of geo-mechanics and sand production, discussing the importance of sand control and the conditions under which it may be required.

Session 2: Sand Control Techniques:
Introduce the sand control techniques used across the industry along with their respective advantages and challenges

Session 3: Formation Sand Sampling:
Review and compare the various formation sand sampling techniques in relation to sand control completion design.

Session 4: Screen and Gravel Selection
Discuss the guidelines used in selecting the most appropriate screen and gravel (types and sizes) for a well.

Session 5 Practical Project
Participants will be given basic well data and must select the appropriate sand control technique.

Day 2

Session 1: Pumping Fluids Systems
Discuss the various carrier fluid systems used in sand control treatments including Newtonian, VES and polymer.

Session 2: Surface and Downhole Equipment
Review the surface pumping and downhole completion equipment used to execute sand control treatments

Session 3: Sand Control Operations Overview
Review the operational steps commonly involved in sand control operations from RIH to POOH

**Session 4: Water Packing**
Discuss the principles, packing mechanisms and design considerations of alpha/beta and alpha/alpha techniques

**Session 5: PackPro Software Introduction**
Introduce and review the PackPro software which will be used to demonstrate the sand control principles and technology covered during the course.

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**Day 3**

**Session 1: Water Pacing Practical Exercise**
Design a water pack and run sensitivity analysis to understand the impact of changing various parameters.

**Session 2: Slurry and Shunt Tube Packing**
Discuss the principles, packing mechanisms and design considerations of slurry packing and shunt tubes.

**Session 3: Shunt Tube Practical Exercise**
Participants will design a shunt tube gravel pack and understand the concept of design windows.

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**Day 4**

**Session 1: Perforating for Sand Control**
Discuss the perforating considerations for sand control techniques used in cased hole completions.

**Session 2: Cased Hole Gravel Pack, High Rate Water Pack and Frac-Pack**
Discuss cased hole gravel packing, high rate water packing and frac-packing principles, application scenarios and design considerations

**Session 3: Cased Hole Gravel Packing Practical Exercise**
Design a cased hole gravel pack and gain practical understanding of how various parameters can affect perforation packing, which is critical for the success of these treatments

**Session 4: Introduction to Gravel Pack Evaluation**
Discuss the different tools available for evaluating gravel packs and present downhole gauge data analysis theory with relevant examples.
Day 5

Session 1: Technique selection and Design Practical project
Participants will be given well data for which they must select, design, present and justify the most appropriate sand control technique

Session 2: Participant Feedback
Open discussion between all participants and instructors to gather feedback/comments for course.