PetroSkills

Horizontal and Multilateral Wells: Analysis and Design - HML1

COURSE

About the Course

This course covers both conventional and unconventional reservoirs.

This course is designed to better advance well concepts including horizontal and multilateral wells as they have become a dominant feature of new field development and redevelopment opportunities. They can, when used appropriately, dramatically improve the economic profitability of field development operations, for both unconventional and conventional resources. The complex, interdisciplinary decisions in advanced well projects are emphasized in this course. The application and benefits of horizontal and multilateral wells are analyzed. The process of candidate screening and selection, involving geological, reservoir, and production characteristics are considered, as well as constraints on drilling and completion options. Methods to predict well performance and recovery from horizontal and multilateral wells are presented with integration of inflow and wellbore flow performance for individual and multilateral wells. Well completion options and its impact on well performance for horizontal and multilateral wells are summarized. The improvement by well stimulation (multistage hydraulic fracturing and matrix acidizing) is evaluated. Economic and risk analysis are also presented with a number of case histories to highlight the performance and benefits of horizontal wells and the elements of risk and uncertainty at the initial design stage.

The instructor will use the examples from participants' field cases for analysis in the class as demonstration exercises. Field problems will be analyzed and suggestions will be provided through the course.

Target Audience

Geologists, reservoir engineers, production and completion engineers, and development, asset, and project managers.

You Will Learn

Participants will learn how to:

- Identify the applications of horizontal, multilateral, and intelligent wells from geological and reservoir aspects
- Assess multidisciplinary inputs for successful screening of advanced well projects
- Predict horizontal and multilateral well productivity with integrated reservoir flow and well flow models
- Evaluate formation damage and well completion effects on advanced well performances
- Diagnose problems in advanced wells and conduct the necessary sensitivity analyses

- Evaluate well stimulation treatments, including multiple-stage fractured horizontal well performance and matrix acidizing results
- Intelligent well concept, design and field applications
- Minimize technical and economic risk in advanced well projects

Course Content

- Technical and economic benefits of advanced well systems
- Reservoir applications for various well types
- The screening of applications for advanced well applications
- Geological structure characteristics
- Classification of advanced wells
- Reservoir inflow performance at different boundary conditions
- Wellbore flow and integrated well performance
- Commingled production and cross flow in multilateral wells
- Formation damage in horizontal and multilateral wells
- Well completion and combined effect of completion and damage on well performance
- Well stimulation evaluation by productivity improvement
- Optimal design of stimulation
- Reservoir simulation considerations
- Applications of intelligent completion in advanced wells
- Risk identification and assessment

Product Details

Categories: Upstream

Disciplines: Reservoir Engineering   Unconventional Resources

Levels: Specialized

Product Type: Course

Formats Available: In-Classroom

Instructors: PetroSkills Specialist   Richard Henry