Directional, Horizontal and Sidetrack Drilling

Table of Contents:

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Introduction:

This course will increase the participants' understanding of the operations carried out by directional drillers and how directional and horizontal wells are planned and optimized. The basic applications and techniques for multilateral wells will be covered and participants will receive Instructions on planning and evaluating horizontal wells based on the objectives of the horizontal well, and how to perform the proper planning for directional and horizontal well. In addition, the training course will cover how to predict wellbore path based on historical data and determine the requirements to hit the target, and help solve related problems.

This training course will feature:

- How to identify candidate wells for horizontal drilling, design horizontal and multilateral well profiles
- Understanding single and double build curve
- Calculating torque and drag
- Understanding kick off methods, compile a drilling and completion program and estimate wellbore stability mud weights.

Objectives

By the end of this BTS training course, participants will be able to:

- Interpret TVD, polar, rectangular coordinates, dogleg severity and the problems associated with it
- Interpret torque and drag and what factors affect those in the drilling process
- Understand main concepts associated to well path planning
- Recommend suitable measures to mitigate operational issues related to directional and horizontal drilling
- Understand main concepts associated to well construction of multilateral wells.

Who should attend?

Drilling Engineers, Senior Drilling Engineers, Drilling Supervisors, Drilling Superintendents, Petroleum Engineers, Completion Engineers, Tool Pushers, Reservoir and Senior Reservoir Engineers, Geologists, Production and Completion Engineers, Foremen, Workover Engineers, Petroleum Engineers, Completion Engineers, Tool Pushers, Reservoir and Senior Industry Personnel, Lifting Personnel, Maintenance Engineers, Technologists, Mud Engineers, Well Site Supervisors, Drilling Contractors, Drilling Supervisors, Completion Engineers, Completion Supervisors, Drilling Managers, Drilling Technical Support Personnel, Trainee Drillers, Rig Engineers, Industry Personnel.

Course Outline:

Directional Profiles and Other Applications of Directional Drilling

- Directional Drilling Fundamentals and short history
- Applications and Limitations
- History and applications of Extended Reach Drilling
- Directional Well profiles (2D, 3D, designer wells)
- Survey calculation methods: Tangential, Balanced Tangential,
- Average Angle, Radius of curvature, Minimum Curvature
- Survey calculation exercises

Dogleg, Torque and Drag Calculations

- Factors that affect torque and drag
- Friction Coefficient
- Directional Profile.
- String Weight
- Directional Drill String Design
- Conventional directional well
- High Angle or Horizontal Well
- Problems & Case history

Planning Directional and Horizontal Wells including Extended Reach Wells (ERD)

- Determining directional well plan
- Planning directional well with single equation
- Planning Horizontal Wells.
- Planning ERD

Hole Cleaning Practices in Deviated and Horizontal Wells:

- Hole Cleaning Problems Associated With Inclination
- Annular Velocity
- Flow Regime And Viscosity
- Drill Pipe Rotation And Reciprocation
- Multi-lateral wells concepts and application
- Horizontal and Multilateral Drilling Technology
- Methods & applications
- Levels of multilateral wells
- How to perform a multi-lateral well
- New technologies application (Rotary Steerable, Thin Wall motors etc.)

Completion for Horizontal and Multi-Lateral Wells:

- The difference of production between horizontal and vertical
- Difference of production between horizontal and ERD
- Difference of production between horizontal and multi-lateral