Well Construction Engineering

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Introduction:

This course draws from the experience and strengths of several instructors to deliver a unique course to the drilling professionals. The course is focused on engineering aspects of well construction from the planning stage to well completion.

This course is essentially a recap of engineering analysis tools and methods needed by the drilling professionals (operation and engineers) to plan and execute the well construction focusing on safety and sound best practices. The topics discussed in the course include planning wells with predictive methods of drilling windows, casing design, and followed by real time well constructions and addressing issues related to drilling problems such as losses, well control, stuck pipe.

Objectives

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

- Learn the industry current best practices methodologies in pre drill well planning for drilling window, casing design, and mud selection
- Understand real time drilling diagnostics and best practices to model and validate pre drill models for pore pressure, wellbore cleaning
- Be able to deal with hole problems and best practices for remediation

Who should attend?

Drilling Engineers, Senior Drilling Engineers, Drilling Supervisors, Workover Engineers, Petroleum Engineers, Completion Engineers, Tool Pushers, Reservoir and Senior Reservoir Engineers, Geologists, Production Engineers, Wellsite Engineers, Foremen, Industry Personnel

Course Outline

- Basic geology
- Pre drill pore pressure
- Pre drill drilling window prediction
- Pre drill casing design and setting depths
- Kick tolerance
- Cementing operation and best practices
- Liner cementation
- Remedial cementation
- Drill bits selection guidelines
- Drill bits design
- Drill bit performance indicators

- Drilling Mechanics
- Drill string functions, components, and selection
- Bottom hole assemblies design and selection
- Drill string design
- Drill string dynamics (vibration detection, resolution, and management)

- Drill string failure analysis
- Torque and drag analysis
- Drilling fluids selection
- Drilling fluid trouble shooting
- Stuck pipe mechanisms and best practices to prevent them
- Shale problems
- Fishing operations
- Free point, backing off
- Fishing tools
- Milling tools, economic time to fish
- Horizontal and extended reach wells

- Wellbore stability
- Torque and drag calculations
- Well profile design
- Multi laterals wells
- Planning consideration

- Cementation junction design
- Well control issues
- Cementation
- High pressure high temperature wells
- Rig selection
- Mud selection
- Breathing problems
- Casing design
- Temperature effect on casing strength
- Well costing
- Drilling time estimate
- NPT

- Risks
- Real time drilling analysis
- Real time drilling window
- Caving analysis
- Mud weight calculation

- Effect of mud and chemistry on wellbore stability
- Technical limit drilling
- Contracting strategies