TORQUE & DRAG AND HYDRAULICS TRAINING

DRL027

COURSE OVERVIEW

This course will cover an overview of torque and drag theory, and software application, which includes the various input requirements, and the analysis and interpretation of Torque and Drag results in drilling operations. Participants will be able to use typical field cases for different drilling operational scenarios such as drilling with rotation, drilling while sliding, pickup without and with rotation, slack-off without and with rotation and rotating off bottom for drill-string design and optimization. This involves the proper selection of drill-pipe grades, class, dimensions and connections; and the number and placement of HWDP, etc. to predict and minimize torque and drag to prevent hole problems; and also meet drill-pipe design limits for tension, torque, buckling and stress within operational and rig requirements. In addition, Participants will introduce on how to compare calculated hook-load and torque values to actual field values in other to identify possible hole problems and frictional factor calibration. Participants will be able to simulate torque and drag outputs under various operational parameters, wellbore profiles and frictional factors for comparison.

COURSE OBJECTIVES

By the end of this course, participant will be able to:

- Explain fundamental concepts of friction in a wellbore
- Understand and model common torque and drag applications
- Describe the common torque and drag limitations and challenges in drilling and casing running
- Describe the benefits of torque and drag software models
- Describe common torque and drag reduction techniques
- Explain the oil and gas industry's responses to torque and drag limitations
- Describe operational lines in torque and drag software and the parameters that define them
- Explain the torque and drag equations and how each variables affects drilling and casing running
- Calibrate a torque and drag model to field results to determine the actual friction factors
- Use torque and drag software to model a well, identify problems, and alleviate or remediate those problems

WHO SHOULD ATTEND

Drilling Engineers, Drilling Supervisors, Risk Managers, and Drilling Managers

COURSE DURATION

5 Working Days

COURSE OUTLINES

1. Pre course evaluation

2. Torque and Drag Fundamentals
   - Friction factor,
   - tortuosity factor fundamentals
   - Side force calculation
   - Soft string, Stiff string, hybrid models
   - Drag forces and Torque analysis
   - Stress calculations

3. Buckling Analysis, Buckling Models and Buckling Limit Factor
   - Twist and stretch
   - Fluid Flow Effects
   - Viscous drag
   - Casing Flotation
   - Margin of overpull, Fatigue analysis

4. Hydraulics Fundamentals
   - Rheology models
   - Pressure losses analysis
   - Basic swab/surge analysis
   - Hydraulics optimization (nozzle size selection)
   - ECD analysis
   - Hole cleaning analysis

5. Post course evaluation.