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COURSE BROCHURE

Torque and Drag Modelling and Friction Factor Calibration Training Course

4 – 8 April 2027
Muscat

Torque and Drag Modelling and Friction Factor Calibration Training Course

Ref: 2943_111729 **Date:** 4 – 8 April 2027 **Location:** Muscat **Fees:** 6500 GBP

Torque and Drag Modelling and Friction Factor Calibration is a 1-week training course for drilling engineers and well planners who prepare a torque and drag plan for one well. Longer laterals and tighter rig ratings mean that surface load limits, not geology, now decide how far many wells can reach. Jupiter Prime Training offers this course on torque and drag modelling and friction factor calibration.

Why Torque and Drag Modelling and Friction Factor Calibration Matters Now

Three pressures shape torque and drag work today. Asset owners push for longer horizontal sections, rig contractors set firm top drive and drawworks ratings, and real-time drilling centres expect every hook load reading compared with prediction. A well modelled with calibrated friction factors reaches its target with margin on torque, tripping and casing running; one modelled with guessed values can stall a liner short of depth or twist off a connection. The course rests on the soft-string and stiff-string calculation approaches.

Who Gains Most from Torque and Drag Modelling and Friction Factor Calibration

- Drilling engineers who check string and casing loads against rig limits
- Well planners who choose trajectories, doglegs and tangent sections
- Real-time monitoring engineers who track hook load and surface torque against prediction
- Completion engineers who run liners, screens and lower completions
- Drilling supervisors who decide on reaming, rotating or sliding

Well delivery groups gain most when a planner, a drilling engineer and a real-time engineer attend together.

Torque and Drag Modelling and Friction Factor Calibration Capabilities

Participants turn survey, string and mud data into load predictions that match rig-floor readings.

- Build a torque and drag model from surveys, string components and fluid density — the well design review
- Calibrate cased-hole and open-hole friction factors from offset well broomstick plots — the planning basis
- Calculate sinusoidal and helical buckling limits — the weight transfer decision
- Test casing and liner running loads, including floatation and rotation options — the run-to-depth decision
- Specify trip, rotate-on and rotate-off load limits for each hole section — the rig crew and supervisor
- Communicate deviations between measured and modelled loads — the real-time drilling centre

Key Torque and Drag Modelling and Friction Factor Calibration Terms

- Friction factor — a calibrated coefficient representing the resistance between the string and the wellbore wall.
- Hook load — the weight measured at the surface hook during tripping or rotation.
- Broomstick plot — a chart of modelled hook load lines for several friction factors with measured readings overlaid.
- Soft-string model — a calculation that treats the string as a cable following the well path.
- Helical buckling — a coiled string shape under high compression that raises contact force and can lock up the string.
- Side force — the contact load per unit length between the string and the wellbore.

Torque and Drag Modelling and Friction Factor Calibration Day by Day

Day 1: Loads Along the Well Path

- Survey Data Quality and Dogleg Severity — Trustworthy Well Path Input
- Axial Load Build-Up From Bit to Surface — Effective Tension Profile
- Side Force and Contact Load Calculation — Wear and Friction Hot Spots
- Buoyancy and Fluid Density Effects — Hook Load Baseline
- Rig Rating and Connection Torque Limits — Allowable Operating Envelope

Day 2: Building the Model

- Soft-String and Stiff-String Calculation Approaches — Choosing Model Fidelity
- String Component Description and Tool Joint Effects — Model Input Accuracy
- Tripping In, Tripping Out and Rotating Off Bottom Cases — Load Case Set
- Sensitivity to Trajectory Shape and Tangent Length — Well Path Optimisation
- Bit Torque and Weight on Bit Inputs — Drilling Load Prediction

Day 3: Friction Factors and Buckling Limits

- Offset Well Broomstick Plot Calibration — Cased and Open Hole Friction Factors
- Mud Type and Lubricant Effects on Friction — Fluid Selection
- Sinusoidal and Helical Buckling Criteria — Maximum Slack-Off Weight
- Lock-Up Prediction in Long Laterals — Reach Limit Assessment
- Hole Cleaning and Cuttings Bed Signatures in Drag — Remedial Circulation Choices

Day 4: Casing Running and Real-Time Comparison

- Casing and Liner Running Load Simulation — Run-to-Depth Feasibility
- Floatation, Rotation and Reaming Options — Liner Deployment Method
- Real-Time Hook Load and Torque Trending — Early Warning of Hole Problems
- Measured Versus Modelled Deviation Thresholds — Escalation to Engineering
- Post-Well Recalibration Records — Friction Factor Library Update

Day 5: Practising the Torque and Drag Plan

- Load Case Modelling for a Case Well — Section by Section Margins
- Friction Factor Selection From Offset Calibration — Base and High Cases
- Buckling and Casing Running Checks — Mitigation Choices per Section
- Real-Time Monitoring Sheet With Trip and Rotate Limits — Rig Floor Use
- Torque and Drag Plan Assembly — Presenting Margins and Mitigations to Well Review

Applying Torque and Drag Modelling and Friction Factor Calibration After the Course

- Recalibrate friction factors for the last two wells using broomstick plots.
- Prepare a real-time monitoring sheet with trip and rotate limits for the next well.

Torque and Drag Modelling and Friction Factor Calibration Questions FAQ

What is torque and drag modelling and friction factor calibration, and why does it matter now?

It is the prediction of string loads along a well, tuned with friction factors taken from real wells. It matters now because longer laterals and fixed rig ratings leave less margin for loads that were guessed rather than calibrated.

Which roles gain most from torque and drag modelling and friction factor calibration training?

Drilling engineers and well planners gain most, along with real-time monitoring engineers and drilling supervisors.

How does torque and drag modelling and friction factor calibration differ from a drill string design course?

It focuses on predicting and calibrating loads rather than sizing pipe. It models friction, buckling and running loads for a given well path.

What do you bring back from torque and drag modelling and friction factor calibration training?

You bring back a draft torque and drag plan for a case well. It sets friction factor cases, section margins, casing running checks and real-time limits.

Torque and Drag Modelling and Friction Factor Calibration: The Way Forward

The torque and drag plan first informs whether the planned trajectory and casing scheme can reach depth within rig limits. Planners, drilling engineers and the real-time centre use it while drilling and tripping. After the well is finished, revisit the friction factors against measured loads, because each recalibration sharpens the next well's plan.