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COURSE BROCHURE

# Advanced Drilling Performance and Technical Limit Training Course

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Sharm El-Sheikh

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Registered in the United Kingdom and Saudi Arabia

# Advanced Drilling Performance and Technical Limit Training Course

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Drilling Performance and Technical Limit is a 2-week training course for drilling engineers, rig superintendents and well planners, built around a campaign performance improvement plan that sets technical limit targets, removes invisible lost time and captures lessons between wells. Rig rates, tighter capital and repeat-well campaigns reward operators who drill each well faster and more predictably than the last. Jupiter Prime Training delivers this Drilling Performance and Technical Limit course for drilling leaders.

## Why Drilling Performance and Technical Limit Matters Now

Factory-style campaigns on onshore pads and offshore clusters let operators compare dozens of similar wells, exposing how much time is lost between best and average performance. Real-time surface and downhole data now show drilling dysfunctions as they happen, yet many crews still drill to habit. Contractors and operators increasingly share performance incentives, so both sides need a common measure of what is achievable. Campaigns that plan to the technical limit cut days per well; those that plan to past averages lock in waste. The course rests on technical limit planning, mechanical specific energy MSE analysis and structured after-action review.

## Who Gains Most from Drilling Performance and Technical Limit

- Engineers who prepare drilling plans for wells, select bits and design bottom-hole assemblies
- Supervisors who lead rig crews and own on-site execution against the well plan
- Planners who build time-depth curves, budgets and campaign schedules
- Engineers who monitor real-time data and advise on parameter changes from the operations centre
- Leads who run lessons-learned reviews and performance contracts with drilling contractors

Well delivery groups gain most when office engineers and rig-based supervisors from the same campaign attend together and agree one set of targets.

## Drilling Performance and Technical Limit Capabilities

Participants leave able to break a well into its operations, see where time and energy are wasted, and set targets that rig crews accept as realistic.

- Build technical limit time-depth curves from offset and best-composite wells — campaign targets and budgets
- Calculate mechanical specific energy and diagnose drilling dysfunctions — real-time parameter decisions
- Specify bit, BHA and directional tools for each hole section — well plan approvals
- Assess invisible lost time in connections, trips and casing runs — rig crew improvement priorities
- Test well control readiness through drills and kick tolerance checks — rig supervisors and contractors
- Apply after-action reviews to feed lessons into the next well — campaign learning loop

## Key Drilling Performance and Technical Limit Terms

- Technical Limit — the best possible time for a well or operation, assuming perfect execution with available technology.
- Invisible Lost Time — time lost within apparently productive operations, such as slow connections or cautious tripping speeds.
- Non-Productive Time — time lost to unplanned events such as equipment failure, waiting or downhole problems.
- Mechanical Specific Energy — the energy needed to remove a unit volume of rock, used to judge drilling efficiency.
- Bottom-Hole Assembly — the drill collars, stabilisers, motors and tools above the bit that control direction and weight.
- After-Action Review — a structured discussion after an operation comparing plan and result to capture usable lessons.

## Drilling Performance and Technical Limit Day by Day

## Day 1: The Economics of Drilling Performance

- Cost per Foot and Days per Well — Campaign Value Drivers
- Rig Contract Structures — Day Rate, Incentive and Performance Clauses
- Pad and Cluster Drilling Campaigns — Repeat-Well Learning Curves
- Offset Well Benchmarking — Quartile Performance Comparisons
- Stakeholder Map of Operator, Contractor and Service Companies — Shared Targets

## Day 2: Technical Limit Planning

- Technical Limit Methodology — Breaking Wells Into Discrete Operations
- Best Composite Well Construction — Combining Best Offset Activities
- Time-Depth Curve Targets — Limit, Stretch and Probabilistic Estimates
- Risk and Contingency Allowances — Realistic Budget Setting
- Target-Setting Sessions With Rig Crews — Securing Field Ownership

## Day 3: Well Planning for Performance

- Pore Pressure and Fracture Gradient Windows — Section Design Choices
- Trajectory Planning — Build Rates, Tortuosity and Torque Limits
- Torque and Drag Modelling — String Design and Reach
- Rig Capability Matching — Hoisting, Pumps and Top Drive Ratings
- Well Plan Structure — Decision Points and Operating Envelopes

## Day 4: Drilling Fluids Performance

- Water-Based and Non-Aqueous Fluid Selection — Formation and Cost Trade-Offs
- Rheology and Equivalent Circulating Density — Window Management
- Solids Control Efficiency — Rate of Penetration and Fluid Cost
- Lost Circulation Prevention Materials — Wellbore Strengthening Options
- Fluid Reports and Daily Checks — Early Warning of Fluid Problems

## Day 5: Bit and BHA Selection

- PDC and Roller Cone Bit Selection — Formation Drillability Matching
- Dull Grading and Bit Records — Feedback for Next Selection
- BHA Design for Stability — Stabiliser Placement and Stiffness
- Downhole Motors and Turbines — Power and Speed Choices
- Drilling Dynamics Modelling — Avoiding Whirl and Stick-Slip

## Day 6: Directional Control

- Rotary Steerable Systems Versus Steerable Motors — Control and Cost
- Measurement and Logging While Drilling — Survey and Geosteering Data
- Anti-Collision Planning — Separation Factors on Crowded Pads
- Wellbore Positional Uncertainty — Target Tolerance Decisions
- Directional Performance Metrics — Sliding Ratio and Dogleg Control

## Day 7: Real-Time Drilling Optimisation

- Mechanical Specific Energy Monitoring — Founder Point and Parameter Tuning
- Vibration Diagnosis — Axial, Lateral and Torsional Dysfunctions
- Remote Operations Centres — Real-Time Advice to the Rig
- Automated Drilling Controls — Automatic Driller and Stick-Slip Mitigation
- Drilling Data Quality — Sensor Calibration and Data Standards

## Day 8: Reducing Lost Time

- Non-Productive Time Classification — Root Causes and Ownership
- Invisible Lost Time Measurement — Connection and Tripping Benchmarks
- Flat-Time Reduction — Casing Running, BOP Testing and Rig Moves
- Equipment Reliability on the Rig — Planned Maintenance Windows
- Logistics and Waiting Time — Materials and Service Coordination

## Day 9: Well Control Readiness and Learning

- Kick Tolerance and Shut-In Planning — Section Readiness Checks
- Well Control Drills — Crew Response Time and Competence
- Barrier Verification Before Critical Operations — Go or No-Go Decisions
- After-Action Reviews — Structured Lessons After Each Section
- Lessons Database Design — Turning Findings Into Drilling Plan Changes

## Day 10: Practising the Campaign Performance Improvement Plan

- Offset Analysis Exercise — Applying Benchmarking to a Case Campaign
- Technical Limit Build — Applying Composite Well and Target Setting
- Real-Time Case Review — Applying MSE and Vibration Diagnosis
- Lost Time Pareto — Applying NPT and Invisible Lost Time Analysis
- Campaign Performance Improvement Plan — Completing Targets, Actions and Learning Loop

## Applying Drilling Performance and Technical Limit After the Course

- Build a technical limit time-depth curve for the next well in the campaign and agree stretch targets with the rig superintendent and contractor.
- Run an after-action review on the last hole section drilled and log three drilling plan changes in the lessons database.

## Drilling Performance and Technical Limit Questions FAQ

### What is drilling performance and technical limit planning and why does it matter now?

It is the practice of setting well targets from the best achievable times and removing visible and invisible lost time. It matters now because repeat-well campaigns, high rig rates and shared contractor incentives reward every day saved per well.

### Which roles gain most from drilling performance and technical limit training?

Drilling engineers, rig superintendents and well planners gain most. You benefit if you write drilling plans, lead rig crews, monitor real-time data or run lessons-learned and performance contracts on drilling campaigns.

### How does a drilling performance and technical limit course differ from a well design course?

It focuses on executing wells faster and more predictably rather than on structural design. A well design course sizes casing and cement, while this one targets technical limits, real-time optimisation, lost time and campaign learning.

## What do you bring back from drilling performance and technical limit training?

You bring back a campaign performance improvement plan. It includes technical limit targets, a lost time Pareto, bit and BHA choices, real-time optimisation triggers and an after-action review routine for your next wells.

## Drilling Performance and Technical Limit: The Way Forward

The campaign performance improvement plan first informs the targets and budget for the next well in the sequence. Drilling engineers, rig superintendents and contractor leads use it together at pre-spud meetings and section reviews. After its first use, revisit the technical limit as each well sets a new best composite, since the limit moves as crews and technology improve.