Directional Drilling and Horizontal Well Optimization Training Course



26 - 30 Oct 2026

Cairo

3700 € (Per Person)

Ref: #OG7238_274771

Course Introduction / Overview:

This comprehensive training course provides an in-depth exploration of the principles, technologies, and best practices governing directional drilling and horizontal well development. In an era where accessing unconventional and complex reservoirs is paramount, mastering these techniques is crucial for maximizing hydrocarbon recovery and operational efficiency. This program, offered by BIG BEN Training Center, is meticulously designed to bridge the gap between theoretical knowledge and practical field application. We will delve into the core concepts as detailed in seminal works like "Applied Drilling Engineering" and explore the geomechanical principles championed by academics such as Dr. Mark D. Zoback, focusing on wellbore stability in deviated wells. Participants will journey from the fundamentals of well path design and survey calculations to advanced geosteering strategies and drilling optimization techniques. The curriculum covers the entire lifecycle, including Bottom Hole Assembly (BHA) design, drilling fluid management, and completion strategies tailored for horizontal wells. By integrating real-world case studies and problem-solving sessions, this course equips professionals with the critical skills needed to plan, execute, and optimize complex drilling projects, ensuring safer operations and enhanced reservoir contact. This is a definitive guide for professionals seeking to excel in the dynamic field of directional and horizontal drilling.

Target Audience / This training course is suitable for:

- Drilling Engineers.
- Well Planners and Wellsite Geologists.
- Reservoir Engineers.
- Completion Engineers.
- Drilling Supervisors and Superintendents.
- Petrophysicists and Geoscientists.
- Directional Drillers and MWD/LWD Engineers.
- Operations Managers.
- Technical Support Staff in the drilling sector.

Target Sectors and Industries:

- Oil and Gas Exploration and Production (E&P) Companies.
- Oilfield Service and Equipment Providers.
- Drilling Contractor Companies.
- Geothermal Energy Development Sector.
- Underground Gas Storage Operators.
- Governmental bodies and regulatory agencies overseeing energy resources.
- Engineering and consulting firms specializing in subsurface projects.

Target Organizations Departments:

- Drilling and Completions Department.
- Well Engineering and Planning Department.
- Geoscience and Reservoir Management Department.
- Production and Operations Department.
- Subsurface Engineering Teams.
- Health, Safety, and Environment (HSE) Department.
- Research and Development (R&D) in drilling technology.

Course Offerings:

By the end of this course, the participants will have able to:

- Master the fundamental principles of directional drilling and well path design.
- Develop comprehensive anti-collision strategies for multi-well pad drilling.
- Select and design optimal Bottom Hole Assemblies (BHA) for various drilling scenarios.
- Utilize MWD and LWD tool data for real-time decision-making and geosteering.
- Analyze and manage wellbore stability issues in highly deviated and horizontal wells.
- Optimize drilling fluid properties for efficient hole cleaning and formation protection.
- Implement advanced techniques for extended-reach drilling (ERD) and multilateral wells.
- Evaluate and plan effective completion and stimulation strategies for horizontal wells.
- Apply risk management frameworks to mitigate operational hazards in directional drilling.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to foster a dynamic and immersive learning environment that goes beyond traditional lectures. This course is built on a foundation of active participation, blending expert-led instruction with practical, hands-on application. We utilize a variety of interactive techniques, including detailed case studies of challenging directional drilling projects from around the globe, allowing participants to analyze real-world problems and solutions. Collaborative group exercises and workshops will challenge teams to design well plans, troubleshoot operational issues, and make critical decisions in simulated scenarios. The sessions will feature open discussions, Q&A panels, and knowledge-sharing opportunities, encouraging participants to draw upon their own experiences. High-quality visual aids, including videos and advanced simulations of wellbore trajectories and downhole tool behavior, will be used to clarify complex concepts. Continuous feedback from the instructor ensures that participants can grasp the material effectively and apply it directly to their professional roles, creating a robust and impactful learning experience.

Course Agenda (Course Units):

Unit One: Fundamentals of Directional and Horizontal Drilling

- Introduction to directional drilling history and applications.
- Key terminology and definitions in directional drilling.
- Types of directional and horizontal well profiles.
- Understanding coordinate systems and survey calculations.
- Principles of well path design and trajectory planning.
- Introduction to deflection tools and techniques.
- The role of directional drilling in modern reservoir development.

Unit Two: Well Planning and Bottom Hole Assembly (BHA) Design

- Data requirements for directional well planning.
- Anti-collision analysis and risk mitigation.
- Designing the optimal well trajectory for reservoir targets.
- Fundamentals of Bottom Hole Assembly (BHA) design.
- Selection criteria for drill bits, motors, and rotary steerable systems (RSS).
- BHA modeling for tendency and performance prediction.
- Torque and drag analysis for deviated wells.

Unit Three: MWD/LWD Tools and Geosteering Operations

- Principles of Measurement While Drilling (MWD) and Logging While Drilling (LWD).
- Understanding the functionality of various MWD/LWD sensors.
- Real-time data transmission and interpretation.
- Introduction to the principles and objectives of geosteering.
- Utilizing LWD data for proactive well path correction.
- Advanced geosteering techniques for complex reservoirs.
- Case studies in successful geosteering applications.

Unit Four: Wellbore Stability and Drilling Fluids Management

- Geomechanical principles and their impact on wellbore stability.
- Identifying and mitigating drilling problems like stuck pipe and hole collapse.
- Drilling fluid properties for deviated and horizontal wells.
- Effective hole cleaning strategies and hydraulics modeling.
- Management of equivalent circulating density (ECD).
- Lost circulation prevention and remediation in directional wells.
- Formation damage mechanisms and prevention.

Unit Five: Advanced Drilling Technologies and Well Completions

- Extended-Reach Drilling (ERD) challenges and solutions.
- Introduction to multilateral well design and technology.
- Managed Pressure Drilling (MPD) applications in directional wells.
- Casing design and running operations in horizontal sections.
- Completion strategies for horizontal and multilateral wells.
- Hydraulic fracturing considerations in unconventional reservoirs.
- Well intervention and workover in horizontal wells.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

Considering the increasing complexity of unconventional reservoirs, how might advancements in real-time data analytics and artificial intelligence reshape the future of geosteering and autonomous directional drilling?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself through a holistic and optimization-focused curriculum that transcends the mere mechanics of directional drilling. While other programs may concentrate on operational procedures, our approach integrates the critical disciplines of geomechanics, reservoir engineering, and real-time data analysis into a unified framework. We emphasize the "why" behind the "how," enabling participants to make informed, data-driven decisions that enhance drilling efficiency and maximize reservoir contact. The content is deeply rooted in academic principles yet delivered through the lens of practical, field-tested applications, featuring case studies that explore both successes and failures to provide invaluable learning lessons. Rather than just presenting tools and technologies, we focus on the strategic thinking required to select and deploy them effectively. The interactive methodology, facilitated by seasoned industry experts, fosters a problem-solving mindset, preparing participants not just to execute well plans but to innovate and optimize them in the face of geological uncertainty and operational challenges. This strategic, multi-disciplinary perspective ensures a deeper, more applicable understanding of horizontal well technology.