MERCURY

Oil & Gas Drilling Best Practices and BHA Design

14 – 18 December 2026
Rome (Italy)



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Ref: 15378_305923 **Date:** 14 – 18 December 2026 **Location:** Rome (Italy) **Fees:** 7200 Euro

Introduction:

Today's drilling personnel must know all the required disciplines to drill a well effectively. This oil and gas drilling best practices and BHA design course provides all the fundamentals for drilling a well, whether shallow, complex, or high-pressure.

This oil and gas drilling best practices and BHA design course is also designed for engineers and field personnel planning and implementing drilling programs. It covers all aspects of drilling technology, emphasizing theory and practical application.

Computer programs are used to design many aspects of modern wells, and the course will provide the participants with the theory behind most programs and practical implementation. It will also include advanced Mud Logging principles and operations.

This oil and gas drilling best practices and BHA design training course builds a firm foundation in the principles and practices of drilling, oil, and gas well planning, drilling fluid, drill string design, hydraulic optimization, and drilling hole problems.

Participants will learn the components of the drilling string and how to use each in optimum ways, evaluate the WOB, and select the proper size of the drill collar. They will also be able to apply practical solutions for analyzing the performance of drill string design for both vertical and direction holes.

Targeted Groups:

- Drilling Engineers.
- Well Site Supervisors.
- Drilling Contractors.
- Drilling Supervisors.
- Trainee Drillers.
- Rig Engineers.

Course Objectives:

At the end of this oil and gas drilling best practices and BHA design course, the participants will be able to:

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- Understand the fundamentals of oil and gas drilling operations.
- Identify and utilize essential oil and gas drilling equipment and tools.
- Explain the oil and gas drilling process and its significance.
- Demonstrate knowledge of oil and gas drilling best practices.
- Analyze and design an effective Bottom Hole Assembly BHA for various drilling scenarios.
- Evaluate the impact of BHA design on drilling performance.
- Enhance skills in BHA design drilling for improved efficiency.
- Gain insights into the purpose and goals of oil and gas drilling.
- Develop strategies for optimizing oil and gas drilling operations.
- Prepare for oil and gas drilling certification through comprehensive training.

Targeted Competencies:

Participants competencies in this oil and gas drilling best practices and BHA design training will:

- Proficiency in oil and gas drilling operations.
- Expertise in the oil and gas drilling process.
- Knowledge of oil and gas drilling equipment and tools.
- Understanding of BHA design in drilling.
- Skills in BHA oil and gas optimization.
- Ability to evaluate and improve drilling BHA design.
- Competence in oil and gas drilling best practices.
- Preparation for oil and gas drilling certification.
- Capability to train others in oil and gas drilling.
- Insight into the purpose of oil and gas drilling.

Course Content:

Unit 1: Drilling Hole Problems and Practical Solutions:

- Hole problems stuck pipe, lost circulation.
- Impact of hole cleaning on hole problems.
- Stuck pipe types.
- Formation and related problems.
- Good recommendations for drilling practices and preventive measurements.
- Fishing tools and implications for the stuck pipe.
- Lost circulation and types.
- Materials used to solve the problems.
- Recommendations and procedures.
- Losses in and not in the reservoir.
- New plug setting technique for healing severe loss.
- How do we solve the problem?

Unit 2: Preventing Wash out and Twist Off:

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- How can you prevent washouts?
- How do you analyze the actual pressure loss of a washout?
- Bit selection and hydraulics application, including nozzle selection:
    - Bit Types.
    - Rolling Cutter Bits.
    - Polycrystalline Diamond Bits.
    - Standard classification of Bits.
    - Preparing the bit to be run in a hole.
    - Run in the hole and drill out cement and plugs.
    - Breaking the bits.
    - Fundamental parameters discussion.
    - Optimizing drilling performance.
    - Drill off test.
    - Drill string dynamic/vibration.
    - Factors related to bit run termination.
    - Bit hydraulic.
- BHA and drill string design, selection of casing seats, BOP equipment:
    - Drill strings.
    - Functions of Drill Pipe, Drill Collars, and BHA Selection.
    - Grades of Drill Pipe and strength properties.
    - Thread types and tool joints.
    - Drill collar weight and neutral point.
    - Basic design calculations based on the depth to be drilled.
    - Functions of stabilizers and roller reamers.

Unit 3: Drilling Fluids Planning and Control, Routine and Special Problems:

- Lifting capacity of drilling fluids, pressure losses in the circulating system, and ECD.
- Functions of the drilling fluid and hydraulic impact on the drilling optimization.
- Parameters affecting the drilling penetrations.
- Drilling fluid properties and functions of drilling fluid.
- Mud properties and problems related to mud properties.
- Seepage loss control.

Unit 4: Well Control & Hydro-dynamic Pressure:

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- Oil and gas well control.
- Three Phases of oil and gas well control.
- Hydro-dynamic pressure.
- Equivalent circulating density.
- Mud weight maintenance.
- The second line of defense.
- Induced Kick.
- Kick detection team.
- Causes of kicks while drilling.
- Indication of induced kicks.
- Diverter guidelines while drilling.
- Best kill procedure for kick type.
- Kick control team.
- Removing gas trapped below the BOP.
- Causes of kicks while tripping.
- Diverter guidelines while tripping.
- Evaluating the off-bottom kick condition.
- Strip and bleed guidelines.
- Volumetric Guidelines.
- Dynamic lubricates and bleed guidelines.
- The third line of defense Underground blowout:
    - Indication of underground blowout.
- Kick detection in oil-base mud.
- Operations that can mask a kick.
- Oil and gas well control kill sheet.

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Unit 5: Planning including Mud Logging Requirements:

- Introduction.
- Modern mud logging unit.
- Petroleum engineering services.
- Gas analysis.
- Cutting evaluation.
- Shale bulk density.
- Shale factor.
- Flowline temperature.
- Drilling Models.
- Petrophysical measurements.
- Drilling porosity.
- Selection of a mud logging service.

Unit 6: BHA Components:

- Non-magnetic BHA components.
- Variable gauge stabilizers VGS.
- Shock-subs.
- Near-bit stabilizers NBS.
- Rotary steerable systems.
- Jar Placement.
- Jar' rules-of-thumb.
- Jarring accelerators.
- Turbine drilling.
- Float subs.