



# Blowout Preventer (BOP) Closing Unit and Stack

# Course Introduction:

This course are fundamental elements in preventing blowouts during drilling operations, serving as the last line of defense against uncontrolled wellbore pressures. This 5-day theoretical training course is designed to provide participants with a detailed understanding of the design, operation, and maintenance of the BOP Closing Unit and Stack, with a focus on their role in well control. Through a comprehensive theoretical approach, the course will delve into the components, functionality, and critical maintenance aspects of the BOP Closing Unit and Stack to ensure the safety and efficiency of drilling operations.

Participants will gain in-depth knowledge of the mechanical, hydraulic, and control systems involved in the closing units and stacks. The course will also cover operational procedures, troubleshooting techniques, and maintenance best practices. By the end of the training, participants will be well-equipped to manage and maintain BOP Closing Units and Stacks, ensuring their readiness and reliability during drilling operations.

## Course Objectives:

**By the end of the training, participants will be able to:**

- Provide a detailed understanding of the design, function, and operation of BOP Closing Units and Stacks.
- Explain the mechanical and hydraulic components that comprise BOP Closing Units and Stacks.
- Identify the key operational procedures for closing units and stack systems in blowout prevention.
- Discuss troubleshooting techniques and common issues in BOP Closing Units and Stacks.
- Educate on maintenance strategies, inspection requirements, and industry standards for BOP Closing Units and Stacks.
- Review safety protocols and regulatory requirements for BOP systems, including Closing Units and Stacks.

# Who Should Attend?

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This course is designed for all:

- Drilling Engineers and Technicians
- BOP Operators and Maintenance Technicians
- Well Control Specialists
- Offshore and Onshore Rig Personnel
- HSE Managers and Safety Officers
- Operations Supervisors
- Compliance and Inspection Officers
- Equipment Reliability Engineers

## Course Outline:

Day 1: Introduction to BOP Closing Units and Stacks

- **Overview of Blowout Preventer Systems**
  - Function and importance of BOP in well control
  - Different BOP configurations: Annular, Ram, and Dual BOP systems
  - Role of BOP Closing Units and Stacks in blowout prevention
- **Components of BOP Closing Units and Stacks**
  - Key components: Closing Unit, Hydraulic Cylinders, Ram Blocks, and Stack Manifolds
  - Types of ram preventers and their functions
  - Design and configuration of the BOP stack
- **Stack and Closing Unit Design**
  - Structural and mechanical design considerations
  - Pressure rating and safety factors for BOP stacks
  - Material selection for components and durability

Day 2: Mechanical and Hydraulic Systems in BOP Closing Units and Stacks

- **Mechanical Systems Overview**
  - Function of the mechanical components in closing units
  - Mechanical linkage, seals, and actuators
  - Design principles for hydraulic cylinders and rams in BOP stacks
- **Hydraulic Systems in Closing Units and Stacks**
  - Overview of hydraulic power units (HPU) and fluid circuits
  - Fluid flow, pressure, and temperature management in closing units

- Hydraulic lines and control systems integration
- **Ram and Seal Technology**
  - Function of ram blocks: shear, pipe, and blind rams
  - Sealing technologies for pressure containment
  - Factors affecting ram performance and longevity

#### Day 3: Operational Procedures for BOP Closing Units and Stacks

- **Operating Principles of BOP Closing Units**
  - Sequential operations for closing units: Closing, sealing, and testing
  - Managing well pressure and preventing blowouts
  - Role of the Closing Unit in sealing against pressure
- **Stack Configuration and Functionality**
  - Overview of BOP stack configurations: Single, dual, and multi-stack units
  - Pressure testing and activation of different stack elements
  - Considerations for stack positioning and maintenance
- **Safety and Emergency Procedures**
  - Emergency shutdown sequences for BOP Closing Units
  - Fail-safe and backup systems in case of hydraulic or mechanical failure
  - Safety checks during operation and pre-operation readiness

#### Day 4: Troubleshooting and Maintenance of BOP Closing Units and Stacks

- **Common Issues in BOP Closing Units and Stacks**
  - Mechanical malfunctions: Jammed rams, seal wear, and linkage issues
  - Hydraulic failures: Leaks, pressure loss, and system contamination
  - Electrical control system faults and communication breakdowns
- **Troubleshooting Techniques**
  - Step-by-step diagnostic approach for BOP Closing Units and Stacks
  - Identifying and resolving pressure and flow issues
  - Using diagnostic tools and indicators for fault detection
- **Maintenance and Inspection Best Practices**
  - Preventive maintenance: Regular inspection schedules and tasks
  - Component wear and tear: Identifying signs of damage or failure
  - Replacing seals, rams, and other key components in BOP stacks
  - Lubrication and fluid maintenance for hydraulic systems

#### Day 5: Safety, Regulations, and Industry Standards

- **Regulatory Compliance and Industry Standards**

- Key standards for BOP design, operation, and testing (e.g., API 16A, API 16D)
- Certification and inspection requirements for BOP systems
- International safety regulations for offshore and onshore operations
- **Safety Protocols for BOP Closing Units and Stacks**
  - Safety measures in the operation of closing units and stack systems
  - Emergency procedures and crew response to BOP system failures
  - Proper documentation and reporting of operational anomalies
- **Future Trends in BOP Technology**
  - Innovations in BOP Closing Units and Stack designs (e.g., automated systems, remote monitoring)
  - Anticipated changes in regulatory standards and technology advancements
  - The role of predictive maintenance and digital monitoring in BOP operations

## Course Methodology:

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**A variety of methodologies will be used during the course that including:**

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

## Course Certificate:

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**International Center for Training & Development (ICTD)** will award an internationally recognized certificate(s) for each delegate on completion of training.

## Course Fees:

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**To be advised as per course location.** This rate includes participant's manual, Hand-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

## Course Timings:

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### Daily Course Timings:

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|---------------|----------------------------|
| 08:00 - 08:20 | Morning Coffee / Tea       |
| 08:20 - 10:00 | First Session              |
| 10:00 - 10:20 | Coffee / Tea / Snacks      |
| 10:20 - 12:20 | Second Session             |
| 12:20 - 13:30 | Lunch Break & Prayer Break |
| 13:30 - 15:00 | Last Session               |

