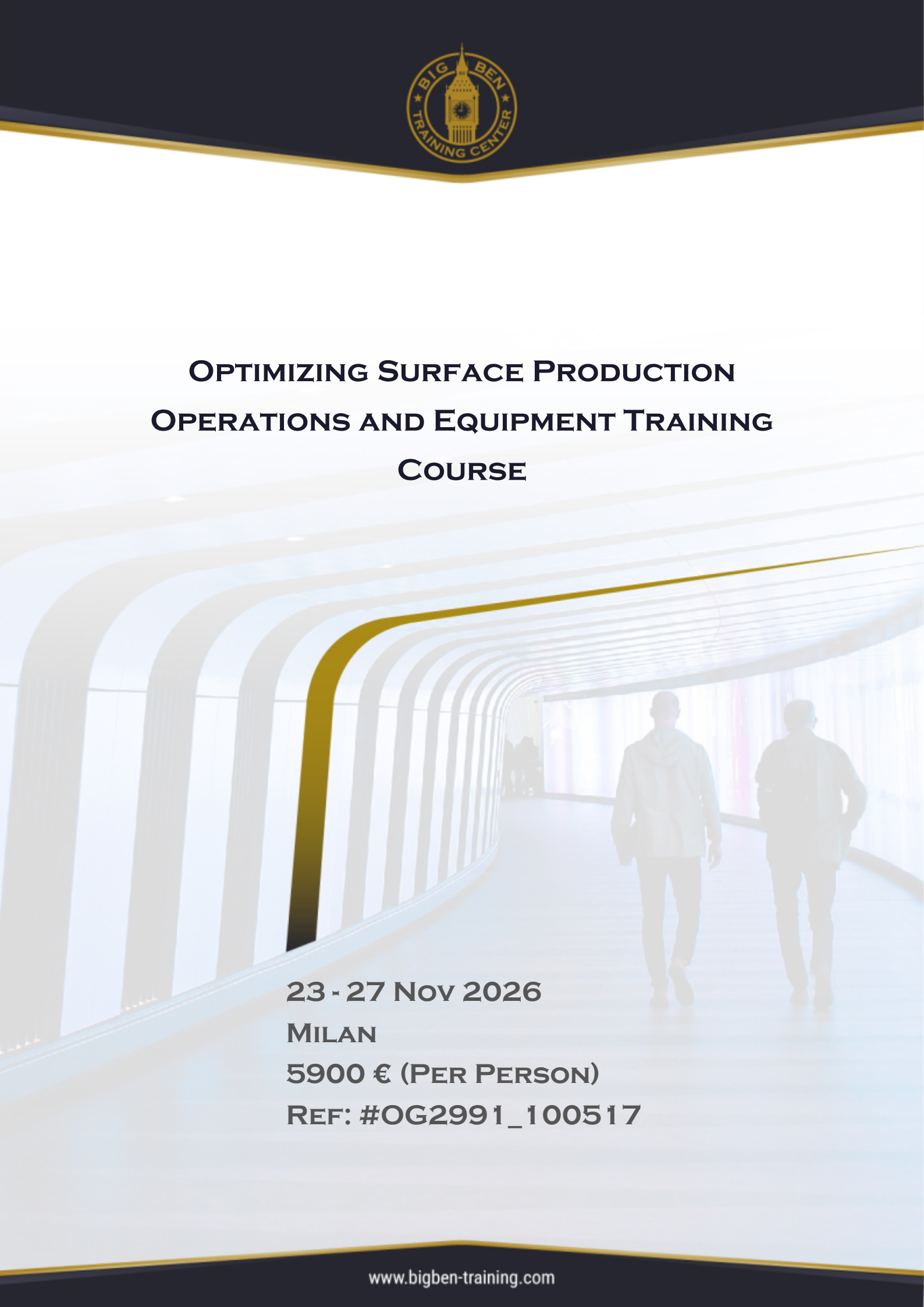
Optimizing Surface Production Operations and Equipment Training Course



23 - 27 Nov 2026

Milan

5900 € (Per Person)

Ref: #OG2991_100517

Course Introduction / Overview:

This comprehensive training course provides an in-depth exploration of surface production operations, from the wellhead to the final sales point. It is meticulously designed to bridge the gap between theoretical principles and practical field applications in hydrocarbon processing. Participants will gain a robust understanding of the equipment, processes, and philosophies that govern the efficient and safe handling of oil, gas, and water. The curriculum delves into the critical aspects of production facility design, equipment sizing, and operational troubleshooting, drawing upon foundational industry knowledge. As emphasized by renowned expert Ken Arnold in his seminal work "Surface Production Operations," a holistic view of the production system is paramount for maximizing recovery and ensuring profitability. This BIG BEN Training Center course is structured to instill that holistic perspective, empowering professionals to make informed decisions that enhance asset performance, ensure process safety, and optimize production throughout the facility's lifecycle. The program covers everything from fluid characterization and separation processes to advanced gas and water treatment techniques, making it an essential learning experience for anyone involved in upstream oil and gas operations.

Target Audience / This training course is suitable for:

- Production Engineers.
- Operations Engineers.
- Facility Engineers.
- Process Engineers.
- Field Production Supervisors and Technicians.
- Project Engineers involved in facility design and construction.
- Reservoir Engineers seeking to understand surface constraints.
- Maintenance Engineers and Planners.
- Technical professionals new to the upstream oil and gas industry.

Target Sectors and Industries:

- Oil and Gas Exploration and Production Companies (E&P).
- Engineering, Procurement, and Construction (EPC) Contractors.
- Oilfield Service and Equipment Supply Companies.
- Consulting firms specializing in petroleum engineering and facility design.
- Governmental bodies and regulatory agencies overseeing the energy sector.

Target Organizations Departments:

- Production and Operations Departments.
- Engineering and Design Departments.
- Project Management Teams.
- Asset Management and Integrity Departments.
- Maintenance and Reliability Departments.
- Health, Safety, and Environment (HSE) Departments.
- Technical Support and Planning Departments.

Course Offerings:

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

- Analyze the complete surface production system from the wellhead to export pipelines.
- Describe the physical properties of oil, gas, and water and their impact on facility design.
- Evaluate the performance and selection criteria for different types of separators.
- Understand the principles behind crude oil dehydration, desalting, and stabilization.
- Design and troubleshoot gas dehydration, sweetening, and compression systems.
- Develop effective strategies for managing and treating produced water.
- Perform preliminary sizing calculations for key production equipment like vessels, pumps, and compressors.
- Identify and mitigate common operational problems in surface facilities.
- Apply safety principles and process control philosophies to production operations.
- Contribute effectively to field development planning and facility debottlenecking projects.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive and participant-centered, ensuring a deep and practical understanding of surface production operations. The course moves beyond traditional lectures by integrating a powerful blend of learning techniques. Each module is delivered by an experienced industry professional who facilitates discussions, encouraging participants to share their own experiences and challenges. A significant portion of the course is dedicated to hands-on problem-solving sessions and group exercises, where attendees will work through equipment sizing calculations and operational scenarios. Real-world case studies of facility design and troubleshooting incidents will be analyzed to illustrate key concepts and their practical implications. Interactive workshops and simulation examples will provide a dynamic environment for learning about process control and system optimization. This blended approach, combining theoretical knowledge with practical application, ensures that participants not only learn the material but also gain the confidence to apply their new skills directly to their work environment upon completion of the course.

Course Agenda (Course Units):

Unit One: Fundamentals of Surface Production and Fluid Properties

- Introduction to the complete production system.
- Reservoir fluids characterization and phase behavior (PVT analysis).
- Properties of crude oil, natural gas, and formation water.
- Well performance, inflow and outflow relationships, and artificial lift overview.
- Basics of multiphase flow and flow assurance challenges.
- Understanding process flow diagrams (PFDs) and piping and instrumentation diagrams (P&IDs).
- Introduction to process safety and hazard management in production facilities.

Unit Two: Wellhead Systems, Separation, and Crude Oil Treatment

- Wellhead components, chokes, and production manifolds.
- Theory and principles of oil, gas, and water separation.
- Types of separators (two-phase, three-phase, vertical, horizontal).
- Separator design, sizing considerations, and performance evaluation.
- Internal components of separators and their functions.
- Crude oil treating processes for dehydration and desalting.
- Oil stabilization techniques to meet vapor pressure specifications.

Unit Three: Natural Gas Processing and Produced Water Management

- Principles of natural gas dehydration using TEG units.
- Gas sweetening processes for removing H2S and CO2.
- Fundamentals of gas compression and compressor types.
- Sizing and selection of compressors for field applications.
- Produced water characteristics and environmental regulations.
- Water treatment equipment and disposal/reinjection strategies.
- Skim tanks, hydro cyclones, and induced gas flotation units.

Unit Four: Principles of Production Equipment Sizing and Selection

- Step-by-step methodology for sizing three-phase separators.
- Sizing and selection of pumps (centrifugal and positive displacement).
- Calculating pump head, power requirements, and NPSH.
- Fundamentals of heat exchanger types and basic sizing.
- Pipeline and flowline sizing for single-phase and multiphase flow.
- Pressure relief valve (PSV) sizing and system design.
- Selection criteria for valves and control instrumentation.

Unit Five: Facility Integration, Control, and Production Optimization

- Process control loops and instrumentation in surface facilities.
- Emergency shutdown (ESD) systems and safety philosophies.
- Metering and custody transfer systems for oil and gas.
- Troubleshooting common operational problems in production facilities.
- Strategies for facility debottlenecking and production optimization.
- Corrosion monitoring and chemical treatment programs.
- Course review, final assessment, and discussion of future trends.

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 global energy transition, how can the principles of efficient equipment sizing and operational optimization in traditional hydrocarbon production be adapted to emerging energy systems like carbon capture and hydrogen production facilities?

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

This course distinguishes itself by offering a uniquely integrated perspective that seamlessly connects the theoretical principles of process engineering with the practical realities of field operations. While many courses focus either on high-level design theory or basic operational procedures, this program is specifically structured to bridge that critical gap. A core differentiator is the heavy emphasis on hands-on equipment sizing calculations and systematic troubleshooting methodologies. Participants will not just learn what a separator does, but how to perform preliminary sizing for one based on production data, and how to diagnose common failures. The curriculum is built around a philosophy of holistic system thinking, encouraging attendees to understand how a decision in one part of the facility impacts the entire production chain. By focusing on the "why" behind operational practices and design choices, rather than just the "how," the course cultivates a deeper level of engineering intuition and problem-solving capability, empowering professionals to enhance safety, efficiency, and profitability in their respective roles.