Process Safety Engineering and HAZOP Leadership Training Course



23 - 27 Nov 2026

Cape town

4600 € (Per Person)

Ref: #OG4222_275027

Course Introduction / Overview:

This comprehensive course provides an in-depth exploration of technical safety engineering principles and the critical leadership skills required to facilitate effective Hazard and Operability (HAZOP) studies. In high-risk industries, a robust Process Safety Management (PSM) system is not just a regulatory requirement but a fundamental pillar of operational excellence and corporate responsibility. This program, offered by BIG BEN Training Center, is designed to equip participants with the technical knowledge and practical skills to identify, assess, and mitigate process-related hazards. Drawing upon the foundational work of pioneers like Trevor Kletz, whose insights in works such as "What Went Wrong?" transformed industrial safety, the course delves into both the 'what' and the 'how' of process safety. Participants will move beyond theoretical concepts to master the application of key methodologies like Process Hazard Analysis (PHA), Layer of Protection Analysis (LOPA), and Safety Integrity Level (SIL) determination. The curriculum is meticulously structured to build a strong foundation in safety engineering before focusing on the nuanced art of HAZOP leadership, ensuring that graduates can confidently guide multidisciplinary teams to achieve thorough and meaningful safety outcomes, thereby safeguarding assets, personnel, and the environment.

Target Audience / This training course is suitable for:

- Process Safety Engineers.
- Chemical and Process Engineers.
- HSE Managers and Advisors.
- Plant and Operations Managers.
- Project Engineers and Managers.
- Instrument and Control Engineers.
- Maintenance and Reliability Professionals.
- Technical Safety Professionals.
- Regulatory Compliance Officers.
- Aspiring HAZOP Leaders and Facilitators.

Target Sectors and Industries:

- Oil and Gas (Upstream, Midstream, and Downstream).
- Petrochemical and Refining.
- Chemical Manufacturing and Processing.
- Pharmaceuticals and Biotechnology.
- Power Generation and Utilities.
- Heavy Manufacturing and Industrial Production.
- Governmental bodies and regulatory agencies.
- Engineering, Procurement, and Construction (EPC) companies.

Target Organizations Departments:

- Health, Safety, and Environment (HSE).
- Engineering and Design.
- Operations and Production.
- Project Management.
- Maintenance and Asset Integrity.
- Technical Services.
- Research and Development.
- Regulatory Affairs and Compliance.

Course Offerings:

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

- Develop a comprehensive understanding of Process Safety Management (PSM) frameworks.
- Master the principles and methodologies of technical safety engineering.
- Lead and facilitate a structured and effective HAZOP study from planning to close-out.
- Apply various Process Hazard Analysis (PHA) techniques to identify potential risks.
- Utilize Layer of Protection Analysis (LOPA) to assess risk and determine safety requirements.
- Understand the fundamentals of Safety Integrity Level (SIL) assessment and verification.
- Analyze and interpret the results of risk assessment studies to inform decision-making.
- Manage HAZOP team dynamics and effectively communicate findings to stakeholders.
- Integrate process safety principles throughout the entire project lifecycle.
- Develop robust recommendations and track their implementation to ensure risk reduction.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive, immersive, and practical, ensuring that participants not only learn the theory but can also apply it effectively in their professional roles. This course moves beyond traditional lectures by incorporating a blended learning approach that emphasizes active participation and real-world problem-solving. A significant portion of the training will be dedicated to hands-on workshops and syndicate exercises where participants will work in teams to conduct simulated HAZOP studies on detailed Process and Instrumentation Diagrams (P&IDs). These sessions are facilitated by experienced instructors who provide real-time feedback and guidance. The curriculum is enriched with detailed case studies of major industrial incidents, allowing for a deep analysis of root causes and preventative measures. Role-playing scenarios will be used to develop essential HAZOP leadership skills, such as managing team dynamics, resolving conflicts, and ensuring comprehensive participation. Open discussions, Q&A sessions, and peer-to-peer knowledge sharing are encouraged throughout the five days to create a collaborative and dynamic learning environment that fosters critical thinking and practical competence.

Course Agenda (Course Units):

Unit One: Fundamentals of Process Safety and Technical Engineering

- Introduction to Process Safety Management (PSM).
- Key international standards and regulations (OSHA 29 CFR 1910.119, Seveso III).
- The role and responsibilities of a Technical Safety Engineer.
- Understanding hazard, risk, and the ALARP principle.
- Fundamentals of inherent safety in design.
- Overview of process safety information and its importance.
- Introduction to the asset lifecycle and safety integration points.

Unit Two: Hazard Identification and HAZOP Methodology

- Techniques for hazard identification (HAZID, What-If, Checklist).
- Deep dive into the Hazard and Operability (HAZOP) study methodology.
- Defining study nodes, intentions, and parameters.
- Systematic application of guidewords and deviation analysis.
- Understanding causes, consequences, and existing safeguards.
- The role of human factors in process deviations.
- Practical exercises in identifying deviations on P&IDs.

Unit Three: Mastering HAZOP Leadership and Facilitation

- The role and competencies of a HAZOP Leader and Scribe.
- Planning and preparation for a successful HAZOP study.
- Techniques for managing the HAZOP team and fostering participation.
- Effective communication and conflict resolution skills.
- Managing time and keeping the study focused and on track.
- Quality control of HAZOP worksheets and documentation.
- Workshop: Role-playing a complete HAZOP meeting session.

Unit Four: Consequence and Risk Analysis

- Introduction to quantitative risk assessment (QRA).
- Layer of Protection Analysis (LOPA) methodology.
- Identifying Independent Protection Layers (IPLs).
- Introduction to Safety Integrity Levels (SIL) and functional safety.
- Using bow-tie analysis for visualizing risk scenarios.
- Basics of consequence modeling for fire, explosion, and toxic release.
- Linking HAZOP findings to LOPA and SIL studies.

Unit Five: Advanced Applications and Safety Management

- Documenting and reporting HAZOP findings and recommendations.
- Developing an effective recommendation tracking system.
- Management of Change (MOC) procedures and their link to process safety.
- Incident investigation, root cause analysis, and learning from events.
- Understanding Safety Critical Elements (SCEs) and performance standards.
- Developing and implementing a site safety case or safety report.
- Course review, final assessment, and action planning for implementation.

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:

Beyond procedural compliance, how can an organization cultivate a deep-rooted safety culture where every individual feels ownership of process safety?

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

This course distinguishes itself by uniquely integrating two critical, yet often separated, domains: the rigorous technical discipline of process safety engineering and the nuanced art of HAZOP leadership. While many programs focus on one or the other, this training provides a holistic perspective, ensuring participants not only understand the complex analytical tools like LOPA and SIL but also possess the facilitation and interpersonal skills to lead a diverse team through a comprehensive risk assessment. The curriculum is built around a practical, hands-on philosophy, moving beyond theoretical lectures to immerse participants in realistic, simulated HAZOP sessions and in-depth case study analyses of real-world industrial incidents. This approach ensures that learning is contextual and immediately applicable. Furthermore, the course places a strong emphasis on the 'why' behind the procedures, fostering a deep understanding of risk management principles rather than just rote memorization of guidewords. By bridging the gap between engineering analysis and effective team leadership, graduates are uniquely equipped not just to participate in safety studies, but to lead them with confidence, drive meaningful discussions, and ensure the resulting recommendations genuinely enhance operational safety and integrity.